Technical Memorandum

Kevin P. Carr, MS., EPC Environmental

Date: August 18, 2022

Re: Adelanto TTM 20514: SFR 83 Development Project – 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 83 lot residential project on 14.51 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 Holly Road, west of Pearmain Street and east of Jonathan Street, and is referred to as APNs: 3128-241-09 and 14.

2.2 **Description:** The Applicant is proposing a tentative tract map to subdivide approximately 14.51 acres into 83 single-family residential lots with a minimum lot size of 3,500 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	

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 are the single-family residential developments located across Holly Road approximately 80 feet south from the southern boundary and approximately 500 feet to the nearest residence from the Project's center.

Additionally, other receptors include the Victoria Magathan Elementary School, located 1,450 feet west of the property southeast corner of the site and approximately 2,000 feet from the center of the site. To estimate the potential impact of construction noise at the residences and 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	80	73.5	40	69.5
Compactor (ground)	80	79.1	20	72.2
Compressor (air)	80	73.6	40	69.6
Crane	80	76.5	16	68.5
Concrete Mixer Truck	80	74.7	40	70.7
Dozer	80	77.6	40	73.6
Dump Truck	80	72.4	40	68.4
Excavator	80	76.6	40	72.6
Front End Loader	80	75.0	40	68.4
Generator	80	76.5	50	73.5

Grader	80	80.9	40	76.9
Offroad Forklift	80	79.3	40	75.3
Paver	80	73.1	50	70.1
Pickup Truck	80	70.9	40	66.9
Roller	80	75.9	20	68.9
Scraper	80	79.5	40	75.5
Welder Torch	80	69.9	40	65.9

1. Nearest Receptor – Residences on Holly.
   Source: FHWA – RCNM Version 1.1

The properties immediately south along are 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 a grader at 80.9 dBA (Lmax) and 76.9 dBA (Leq). The same piece of equipment operating at the center of the site would generate noise levels of 61.7 dBA (Lmax) and 57.7 dBA (Leq) and at the school levels of 55.8 dBA (Lmax) and 51.8 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 area roadways are presented in Table 3.3.

Table 3.3 Estimated Traffic Roadway Conditions

Roadway	Number of Lanes	ADT
SR 395 / Holly	4	15,000(1)
Mojave Drive	4	9,589 (2)
Palmdale (SR18)	4	22,939
Aster Road	4	17,500 (3)
Cactus Road	2	6,800 (4)

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) Caltrans 2020 Traffic Census Program.
(2) Assumes ½ of traffic on Mojave Drive east of 395 travels west on Mojave Drive.
(3) Table 4.16-1 Arterial/Highway Daily Volume Threshold.
(4) Table 4.16-2 Collector Daily Volume Threshold.

The Institute of Traffic Engineers (ITE) Land Use 210 designation was used for calculations to determine the average daily trips (ADT) generated by the Project. The ITE 210 Single-Family Housing Land Use designation estimates 9.44 daily trips per dwelling unit for a total of 784 trips per day (ADT).

The residential housing directly south of the Project site along Holly Road between Jonathan Street and Caliente Road, north of Poppy consists of 228 SFR units and currently generates approximately 2,152 ADT. Although there are other residential communities in the area of the Project these home have a direct impact on traffic along Holly Road.

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 above implementation of the Project will increase traffic volumes in the area by approximately 784 ADT, but not to the extent that

[1] Institute of traffic Engineers (ITE) Code 210 Single Family Detached Housing 9.44 ADT/dwelling unit.
[2] Caltrans, Traffic Noise Analysis Protocol, April 2020, p.7-1.

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.

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

[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.

[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 August 17, 2022.

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 80 feet from the property line. The estimated construction vibration level from a large bulldozer (worst case 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

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

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: 08/17/2022
Case Description: TTM20514

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Victoria Magathan Elem 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	1450.0	0.0
Dozer	No	40		81.7	1450.0	0.0
Scraper	No	40		83.6	1450.0	0.0
Excavator	No	40		80.7	1450.0	0.0
Grader	No	40	85.0		1450.0	0.0
Scraper	No	40		83.6	1450.0	0.0
Crane	No	16		80.6	1450.0	0.0
Gradall	No	40		83.4	1450.0	0.0
Generator	No	50		80.6	1450.0	0.0
Welder / Torch	No	40		74.0	1450.0	0.0
Compressor (air)	No	40		77.7	1450.0	0.0
Paver	No	50		77.2	1450.0	0.0
Roller	No	20		80.0	1450.0	0.0
Pickup Truck	No	40		75.0	1450.0	0.0
Compactor (ground)	No	20		83.2	1450.0	0.0
Concrete Mixer Truck	No	40		78.8	1450.0	0.0
Dump Truck	No	40		76.5	1450.0	0.0
Front End Loader	No	40		79.1	1450.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	48.3	44.3	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Dozer	52.4	48.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Scraper	54.3	50.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Excavator	51.5	47.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Grader	55.8	51.8	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Scraper	54.3	50.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Crane	51.3	43.3	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Gradall	54.2	50.2	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Generator	51.4	48.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Welder / Torch	44.8	40.8	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Compressor (air)	48.4	44.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Paver	48.0	45.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Roller	50.8	43.8	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Pickup Truck	45.8	41.8	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Compactor (ground)	54.0	47.0	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	49.6	45.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Dump Truck	47.2	43.2	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	49.9	45.9	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Total	55.8	59.9	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 on Holly	Residential	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	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Scraper	No	40		83.6	80.0	0.0
Excavator	No	40		80.7	80.0	0.0
Grader	No	40	85.0		80.0	0.0
Scraper	No	40		83.6	80.0	0.0
Crane	No	16		80.6	80.0	0.0
Gradall	No	40		83.4	80.0	0.0
Generator	No	50		80.6	80.0	0.0
Welder / Torch	No	40		74.0	80.0	0.0
Compressor (air)	No	40		77.7	80.0	0.0
Paver	No	50		77.2	80.0	0.0
Roller	No	20		80.0	80.0	0.0
Pickup Truck	No	40		75.0	80.0	0.0
Compactor (ground)	No	20		83.2	80.0	0.0
Concrete Mixer Truck	No	40		78.8	80.0	0.0
Dump Truck	No	40		76.5	80.0	0.0
Front End Loader	No	40		79.1	80.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	73.5	69.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	4.5	N/A	4.5	N/A	N/A
Dozer	77.6	73.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	8.6	N/A	8.6	N/A	N/A
Scraper	79.5	75.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	10.5	N/A	10.5	N/A	N/A
Excavator	76.6	72.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	7.6	N/A	7.6	N/A	N/A
Grader	80.9	76.9	N/A	65.0	N/A	65.0	N/A	N/A	N/A	11.9	N/A	11.9	N/A	N/A
Scraper	79.5	75.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	10.5	N/A	10.5	N/A	N/A
Crane	76.5	68.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	3.5	N/A	3.5	N/A	N/A
Gradall	79.3	75.3	N/A	65.0	N/A	65.0	N/A	N/A	N/A	10.3	N/A	10.3	N/A	N/A
Generator	76.5	73.5	N/A	65.0	N/A	65.0	N/A	N/A	N/A	8.5	N/A	8.5	N/A	N/A
Welder / Torch	69.9	65.9	N/A	65.0	N/A	65.0	N/A	N/A	N/A	0.9	N/A	0.9	N/A	N/A
Compressor (air)	73.6	69.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	4.6	N/A	4.6	N/A	N/A
Paver	73.1	70.1	N/A	65.0	N/A	65.0	N/A	N/A	N/A	5.1	N/A	5.1	N/A	N/A
Roller	75.9	68.9	N/A	65.0	N/A	65.0	N/A	N/A	N/A	3.9	N/A	3.9	N/A	N/A
Pickup Truck	70.9	66.9	N/A	65.0	N/A	65.0	N/A	N/A	N/A	1.9	N/A	1.9	N/A	N/A
Compactor (ground)	79.1	72.2	N/A	65.0	N/A	65.0	N/A	N/A	N/A	7.2	N/A	7.2	N/A	N/A
Concrete Mixer Truck	74.7	70.7	N/A	65.0	N/A	65.0	N/A	N/A	N/A	5.7	N/A	5.7	N/A	N/A
Dump Truck	72.4	68.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	3.4	N/A	3.4	N/A	N/A
Front End Loader	75.0	71.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	6.0	N/A	6.0	N/A	N/A
Total	80.9	85.0	N/A	65.0	N/A	65.0	N/ A	N/A	N/A	20.0	N/A	20.0	N/A	N/A

**** Receptor #3 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
South Residential - Center	Residential	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	500.0	0.0
Dozer	No	40		81.7	500.0	0.0
Scraper	No	40		83.6	500.0	0.0
Excavator	No	40		80.7	500.0	0.0
Grader	No	40	85.0		500.0	0.0
Scraper	No	40		83.6	500.0	0.0
Crane	No	16		80.6	500.0	0.0
Gradall	No	40		83.4	500.0	0.0
Generator	No	50		80.6	500.0	0.0
Welder / Torch	No	40		74.0	500.0	0.0
Compressor (air)	No	40		77.7	500.0	0.0
Paver	No	50		77.2	500.0	0.0
Roller	No	20		80.0	500.0	0.0
Pickup Truck	No	40		75.0	500.0	0.0
Compactor (ground)	No	20		83.2	500.0	0.0
Concrete Mixer Truck	No	40		78.8	500.0	0.0
Dump Truck	No	40		76.5	500.0	0.0
Front End Loader	No	40		79.1	500.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	57.6	53.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Dozer	61.7	57.7	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Scraper	63.6	59.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Excavator	60.7	56.7	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Grader	65.0	61.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Scraper	63.6	59.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Crane	60.6	52.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Gradall	63.4	59.4	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Generator	60.6	57.6	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Welder / Torch	54.0	50.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Compressor (air)	57.7	53.7	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Paver	57.2	54.2	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Roller	60.0	53.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Pickup Truck	55.0	51.0	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Compactor (ground)	63.2	56.2	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	58.8	54.8	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Dump Truck	56.5	52.5	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	59.1	55.1	N/A	65.0	N/A	65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Total	65.0	69.1	N/A	65.0	N/A	65.0	N/A	N/A	N/A	4.1	N/A	4.1	N/A	N/A