NOISE IMPACT ASSESSMENT

FOR

SANTA MARIA REFINERY DEMOLITION AND REMEDIATION PROJECT

2555 WILLOW ROAD AVENUE

ARROYO GRANDE, CA

FEBRUARY 2023

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

PROPOSED PROJECT SUMMARY

The project proposes to discontinue processing crude oil at the Santa Maria Refinery, shutdown and decontaminate the facility, and then demolish the refinery and perform site remediation. As currently proposed, demolition activities would be limited to the daytime hours. Potential future uses of the site are unknown and are speculative at this time and therefore future uses are not considered in the project. The project location is depicted in Figure 1.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

AMPLITUDE

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale as discussed below. Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements have determined that a 10 dB increase in amplitude correlates with a perceived doubling of loudness and a 3 dB change in amplitude is the minimum audible difference perceptible to the average person.

FREQUENCY

Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA.

ADDITION OF DECIBELS

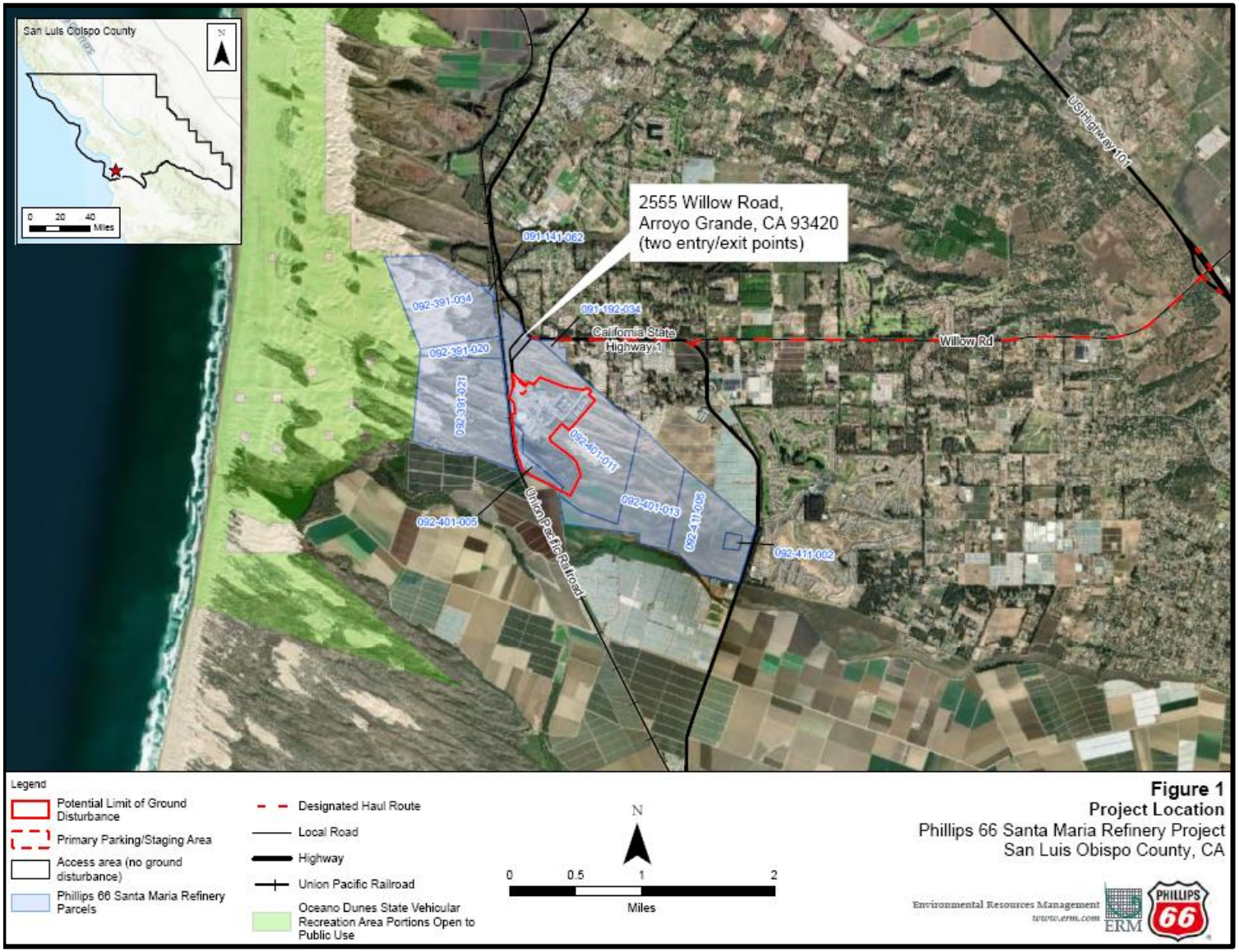
Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

SOUND PROPAGATION & ATTENUATION

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between a line source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 dB per doubling of distance from a line source.

FIGURE 1. PROJECT LOCATION



Note: Not to Scale

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in an approximate 5 dB of noise reduction. Taller barriers provide increased noise reduction. Intervening buildings can reduce noise levels by as much as approximately 15 dB.

NOISE DESCRIPTORS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted noise scale. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise. In addition, the intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. Common noise descriptors used in this analysis are summarized in Table 1.

TABLE 1. COMMON ACOUSTICAL TERMS AND DESCRIPTORS

Descriptor	Definition
Decibel (dB)	A unit-less measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Energy Equivalent Noise Level (Leq)	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Maximum Noise Level (Lmax)	The maximum instantaneous noise level during a specific period of time.

REGULATORY FRAMEWORK

COUNTY OF SAN LUIS OBISPO NOISE CONTROL ORDINANCE

The intent of the County of San Luis Obispo Noise Regulation Ordinance (Title 22, Chapter 22.10.120) is to establish acceptable standards for, and describe how to measure, daytime and nighttime noise levels. Implementation of these standards helps protect the public health, welfare and safety from excessive and detrimental noise levels (County of San Luis Obispo 2022). The County's noise ordinance standards apply to non-transportation (stationary) noise sources. The County's noise ordinance standards are summarized in Table 2. It is important to note, however, that noise generated by construction/demolition activities are

exempt from these standards provided such activities do not take place before 7:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 8:00 a.m. or after 5:00 p.m. on Saturday or Sunday.

TABLE 2. MAXIMUM ALLOWABLE NOISE EXPOSURE – STATIONARY SOURCES

Noise Standard	Noise Level (L_{eq} dBA)	
	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Exterior Standards		
Hourly equivalent level	50	45
Maximum level	70	65
Interior Standards		
Hourly equivalent level	40	35
Maximum level	60	55

Construction/demolition activities are exempt from these standards provided such activities do not take place before 7:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 8:00 a.m. or after 5:00 p.m. on Saturday or Sunday.
Source: County of San Luis Obispo 2022

GROUNDBORNE VIBRATION

There are no federal, state, or local quantitative regulatory standards for groundborne vibration. However, Caltrans has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in Table 3. The criteria apply to continuous vibration sources, which includes vehicle traffic and most construction activities. All damage criteria for buildings are in terms of ground motion at the buildings' foundations. No allowance is included for the amplifying effects of structural components (Caltrans 2020).

As shown in Table 3, the threshold for architectural damage commonly applied to construction activities is a peak particle velocity (ppv) of 0.20 inches per second (in/sec) for fragile structures and 0.50 in/sec ppv for newer structures. Levels above 0.20 in/sec ppv may result in increased levels of annoyance for people in buildings (Caltrans 2020).

TABLE 3. SUMMARY OF GROUNDBORNE VIBRATION LEVELS AND POTENTIAL EFFECTS

Vibration Level (in/sec ppv)	Human Reaction	Effect on Buildings
0.006-0.019	Threshold of perception; possibility of intrusion.	Vibrations unlikely to cause damage of any type.
0.08	Vibrations readily perceptible.	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.10	Level at which continuous vibrations begin to annoy people.	Virtually no risk of "architectural" damage to normal buildings.
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations).	Threshold at which there is a risk of "architectural" damage to fragile buildings.
0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Potential risk of "architectural" damage may occur at levels above 0.3 in/sec ppv for older residential structures and above 0.5 in/sec ppv for newer structures.

The vibration levels are based on peak particle velocity in the vertical direction for continuous vibration sources, which includes most construction activities.
Source: Caltrans 2020

AMBIENT NOISE ENVIRONMENT

NOISE-SENSITIVE LAND USES

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other noise-sensitive land uses include hospitals, convalescent facilities, parks, hotels, libraries, places of worship, and other uses where low interior noise levels are essential.

Noise-sensitive receptors in the project area consist predominantly of residential dwellings located to the north and east of the project site. The nearest residence is located approximately 1,100 feet from the project site, along Gasoline Alley. Other nearby residential land uses are located northeast of the project site along Winterhaven Way, south of State Route (SR) 1, and north of the project site, across SR-1.

AMBIENT NOISE LEVELS

The noise environment in the proposed project area is defined primarily by vehicular traffic along SR-1 and area roadways. Industrial activities also contribute to the ambient noise environment as some nearby land uses, particularly those generally located east of the project site.

To document existing ambient noise levels at the project site, short-term ambient noise measurements were conducted on the weekdays of December 5^{rth}, 7th, 8th, and 16th; and on Saturday, December 17th, of 2022. Long-term noise measurement surveys were also conducted near the northern boundary of the project site, in the general vicinity of nearby residential land uses and along SR-1 and Willow Road. Noise measurements were conducted using a Larson Davis Laboratories Type I, Model LxT sound-level meter and a SoftdB Type II, Piccolo sound-level meter positioned at a height of approximately 5 feet above ground level. Noise measurement equipment was calibrated prior to and upon completion of the noise measurement survey. Short-term measured ambient noise levels are summarized in Table 4 and long-term measured ambient noise levels are summarized in Table 5. Noise measurement locations are depicted in Figure 2.

Based on the noise measurements conducted, ambient noise levels at nearby residential land uses are generally higher at locations located nearest SR-1 and decrease with increased distance from SR-1. Ambient noise levels at some nearby residential land uses, particularly those generally located east of the project site, are also influenced by nearby industrial activities (e.g., material handling, forklifts, back-up alarms). As noted in Tables 4 and 5, measured daytime (7:00 a.m. to 10:00 p.m.) average-hourly ambient noise levels ranged from approximately 47 to 74 dBA L_{eq}. Instantaneous daytime noise levels at these same locations ranged from approximately 55 to 98 dBA L_{max}. Measured daytime ambient noise levels conducted on Saturday December 17th were roughly equivalent to measured weekday ambient noise levels.

TABLE 4. SUMMARY OF SHORT-TERM AMBIENT NOISE MEASUREMENT DATA

	Measurement Location	Primary Noise Source(s)	Measured Noise Levels (dBA)	
			L_{eq}	Lmax
WEEKDAY NOISE LEVELS				
1	931 Sheridan Rd.	Nearby industrial activities/backup beepers, vehicles on area roadways	46-57	64-76
2	Arriba Pl. east of Sheridan Rd.	Nearby industrial activities/backup beepers, vehicles on area roadways	55	66
3	Winterhaven Way south of SR-1	Vehicle traffic on area roadways	50-53	57-81
4	Alley Oop Way at Gasoline Alley	Nearby industrial activities/backup beepers, vehicles on area roadways	51-55	67-72
5	North of SR1 near Calendar Loop Path	Vehicle traffic on area roadways	53-55	59-77
6	SR1 East of Sheridan Rd.	Vehicle traffic on area roadways	71	81
7	Willow Rd., East of SR-1	Vehicle traffic on area roadways	68	78
8	Olivera Ave., West of SR-1	Vehicle traffic on area roadways	47	67
9	Dawn Rd., East of SR-1	Vehicle traffic on area roadways	53-55	61
10	Mesa Vu Storage	Vehicle traffic on area roadways	69	81
WEEKEND NOISE LEVELS				
1	931 Sheridan Rd.	Nearby industrial activities/backup beepers, vehicles on area roadways	51	69
2	Arriba Pl. east of Sheridan Rd.	Nearby industrial activities/backup beepers, vehicles on area roadways	51	53
3	Winterhaven Way south of SR-1	Vehicle traffic on area roadways	51	77
4	Alley Oop Way at Gasoline Alley	Nearby industrial activities/backup beepers, vehicles on area roadways	48	63
5	North of SR-1 near Calendar Loop Path	Vehicle traffic on area roadways		
6	SR1 East of Sheridan Rd.	Vehicle traffic on area roadways		
7	Willow Rd., East of SR-1	Vehicle traffic on area roadways		
8	Olivera Ave., West of SR-1	Vehicle traffic on area roadways		
9	Dawn Rd., East of SR-1	Vehicle traffic on area roadways	52	59
10	Mesa Vu Storage	Vehicle traffic on area roadways	69	78

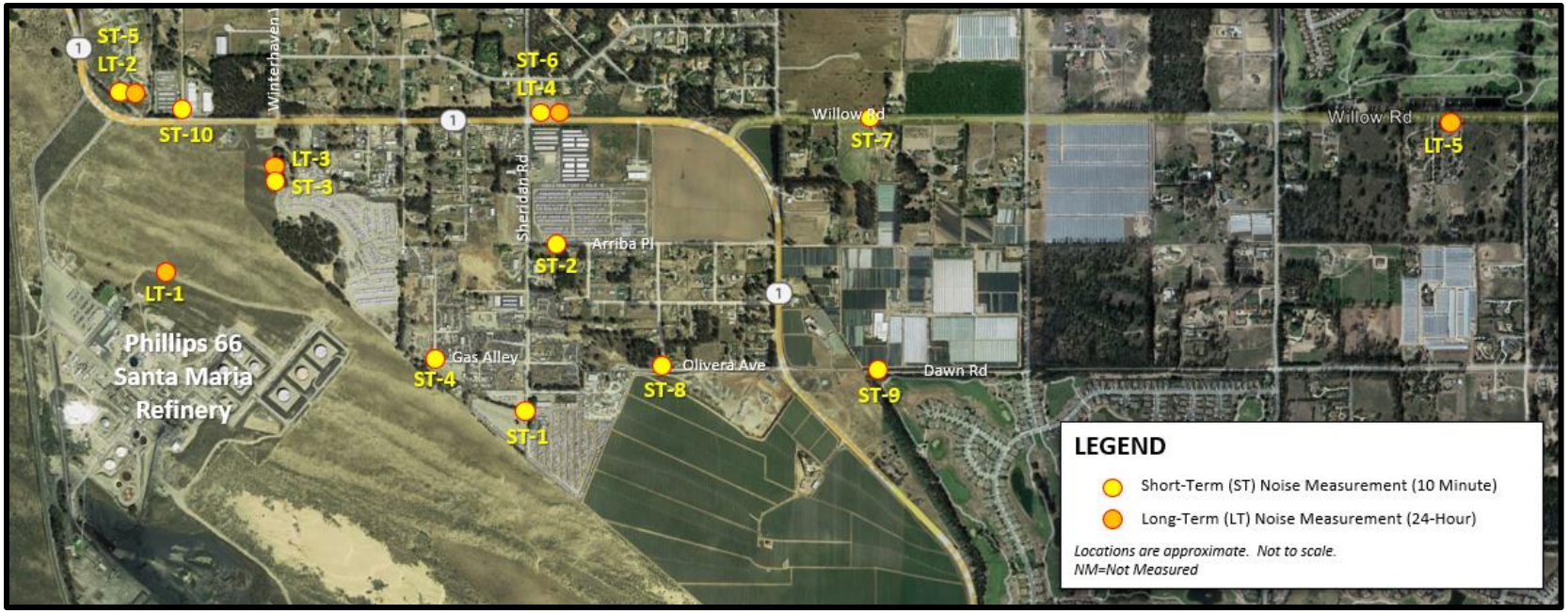
Noise measurements were conducted over a period beginning on December 6, 2022 and ending on December 16, 2022 using a Larson Davis Type I LxT sound-level meter and a SoftdB, Type II, Piccolo sound-level meter placed at a height of approximately 5 feet above ground level. Refer to Figure 2 for noise measurement locations.

TABLE 5. SUMMARY OF LONG-TERM AMBIENT NOISE MEASUREMENT DATA

	Measurement Location	Primary Noise Source(s)	Measured Noise Levels (dBA)			
			Daytime (7 a.m. - 10 p.m.)		Nighttime (10 p.m. – 7 a.m.)	
			L_{eq}	L_{max}	L_{eq}	L_{max}
WEEKDAY NOISE LEVELS						
1	Phillips 66 Refinery, Northern Plant Boundary	Plant operations.	50-58	58-79	54-57	58-77
2	North of SR-1 near Calendar Loop Path	Vehicle traffic on area roadways	52-59	69-77	44-58	69-77
3	Winterhaven Way south of SR-1	Vehicle traffic on area roadways	57-63	66-89	53-63	65-82
4	SR1 East of Sheridan Rd.	Vehicle traffic on area roadways	68-74	83-98	59-74	83-93
5	Willow Rd., East of Padre Ln.	Vehicle traffic on area roadways	58-64	68-72	48-63	68-71
WEEKEND NOISE LEVELS						
1	Phillips 66 Refinery, Northern Plant Boundary	Plant operations.	48-58	55-82	54-57	61-75
3	Winterhaven Way south of SR-1	Vehicle traffic on area roadways	55-64	68-94	53-64	65-89

Noise measurements were conducted over a period beginning on December 6, 2022 and ending on December 16, 2022 using a Larson Davis Type I LxT sound-level meter and a SoftdB, Type II, Piccolo sound-level meter placed at a height of approximately 5 feet above ground level. Refer to Figure 2 for noise measurement locations.

FIGURE 2. NOISE MEASUREMENT SURVEY LOCATIONS



Not to scale. Locations are approximate.

NOISE IMPACT ASSESSMENT

METHODOLOGY

Demolition/Remediation Noise Levels

Noise levels associated with on-site demolition/remediation were calculated based on representative off-road equipment identified for above-ground and below-ground activities. A detailed list of equipment is included in Table 6. Representative noise levels associated with off-road equipment at are summarized in Table 7. To be conservative, all equipment is assumed to be operating simultaneously. Based on this assumption, off-road equipment would generate a combined noise levels of 74 dBA L_{eq} at 200 feet used for below-ground activities and 71.9 dBA L_{eq} at 200 feet for above-ground activities (FHWA 2008). Maximum instantaneous noise levels would be approximately of 78 dBA L_{max} at 200 feet used for below-ground activities and 68.6 dBA L_{max} at 200 feet for above-ground activities (FHWA 2008). Use of the concrete crusher and asphalt pulverizer were assumed to generate noise levels of approximately 86.5 L_{eq} and 83.6 dBA L_{max} at 50 feet, based on measurements obtained from similar equipment (LSA 2006).

TABLE 6. ANTICIPATED OFF-ROAD EQUIPMENT USAGE

Above Ground Phase	Below Ground Phase	Crushing Equipment
2 Skid Steer Loader	6 Excavators	Rock Crusher
2 Aerial Lifts	2 Hydraulic Braker Ram	Pulverizer
1 Off-Highway Trucks	1 Skid Steer Loader	
2 Cranes	2 Off Highway Trucks	
2 Generator Set	1 Front End Loader	
	2 Generator Set	
	1 Auger Drill Rig	

Based on anticipated equipment provided by applicant. The Below Ground Phase equipment is split over two areas.

TABLE 7. REPRESENTATIVE NOISE LEVELS FOR OFF-ROAD EQUIPMENT

Equipment	Distance (feet)	L_{max}	L_{eq}
Front End Loader	200	67.1	63.1
Skid Steer Loader	200	67.1	63.1
Aerial Lift	200	62.7	55.7
Off-Highway Trucks	200	64.4	60.4
Cranes	200	68.5	60.6
Generator Set	200	68.6	65.6
Excavators	200	68.7	64.7
Hydraulic Braker Ram	200	78.0	68.0
Auger Drill Rig	200	72.3	65.3
Concrete Crusher & Asphalt Pulverizer	50	83.6	75.9

Source: Based on information derived from the FHWA's Road Construction Noise Model (FHWA 2008). Representative noise levels for concrete crusher and asphalt pulverizer were conservatively based on representative measured noise levels for a rock crusher (LSA 2006).

Based on information provided for the project, some activities would be anticipated to occur simultaneously. Based on the project information provided, predicted worst-case noise levels at the nearest residential land uses were determined to occur during periods associated with the below-ground demolition of the tanks, above-ground demolition on the refinery facility, and operation of the asphalt pulverizer, and rock crusher. Combined noise levels associated with these activities, predicted noise contours, and predicted noise levels at nearby land uses were predicted using the SoundPlan computer program. The SoundPlan computer program is a sophisticated computer model capable of taking into account the effects of intervening terrain, structures, and ground attenuation.

Demolition/Remediation Groundborne Vibration Levels

Groundborne vibration levels associated with demolition/remediation activities were quantitatively assessed based on construction-equipment vibration levels typically associated with off-road equipment. Representative groundborne vibration levels for based on published information obtained from the California Department of Transportation (Caltrans 2020).

IMPACT SIGNIFICANCE CRITERIA

Demolition/Remediation Noise Levels

As previously noted, daytime construction-related activities are exempt from the County's noise standards for non-transportation noise sources. In addition, the County has not adopted quantitative noise standards that specifically apply to short-term construction activities. However, based on screening noise criteria commonly recommended by other agencies, construction activities would generally be considered to have a potentially significant impact if average daytime noise levels would exceed 90 dBA L_{eq} when averaged over a 1-hour period ($L_{eq}(1)$), or 80 dBA L_{eq} when averaged over an 8-hour period ($L_{eq}(8)$) (FTA 2018). Because some activities may not occur over a full 8-hour day and to be conservative, construction/remediation noise levels would be considered to have a potentially significant impact if predicted noise levels at noise-sensitive land uses would exceed the daytime noise standard of 80 dBA L_{eq} when averaged over a 1-hour period. As previously noted, demolition/remediation activities would not occur during the nighttime hours.

Demolition/Remediation Groundborne Vibration Levels

Groundborne vibration levels were evaluated in comparison, to the criteria identified in Table 3. Based on these levels, groundborne vibration levels would potentially cause structural damage if levels would exceed a 0.5 in/sec ppv and cause human annoyance if levels exceed 0.2 in/sec ppv.

IMPACTS

Demolition/Remediation Noise Levels

Predicted operational noise levels and contours associated with on-site demolition/remediation activities are summarized in Table 8. Predicted average-hourly (dBA L_{eq}) and instantaneous (dBA L_{max}) noise contours are depicted in Figures 3 and 4.

TABLE 8. PREDICTED ON-SITE DEMOLITION/REMEDIATION NOISE LEVELS AT NEARBY LAND USES

Receiver	Noise Level dBA L_{eq}	L_{max}
R-1	61.4	60.5
R-2	62.4	61.8
R-3	64.8	65.3
R-4	66.1	68.2
R-5	59.7	60.2
R-6	52.5	53.3
R-7	50.3	50.9
R-8	48.2	48.6
Refer to Figure 3 and Figure 4 for receiver locations		

As depicted in Table 8, predicted exterior demolition/remediation noise levels at the property line of nearest residential land use (Receiver R-4 in Figures 3 and 4) would be 66.1 dBA L_{eq} and 68.2 L_{max}. Predicted noise levels at other nearby residences would range from 48.0 to 64.6 dBA L_{eq} and 48.6 to 65.3 L_{max}. Predicted demolition/remediation noise levels at the nearest residences would not exceed 80 dBA L_{eq}. As a result, noise mitigation would not be required for this project.

As mentioned previously, ambient noise levels at nearby residence range from 48-74 dBA L_{eq}. Depending on time of day, on-site demolition/remediation activities would be detectable at nearby land uses, particularly those residential land uses located nearest the project site. However, it is important to note that these predicted noise levels would only occur when activities occur nearest the northern and eastern boundaries of the project site and with all equipment operating simultaneously. Predicted noise levels would be short-term and would decrease as demolition/remediation activities move away from nearby land uses.

Demolition/Remediation Off-Site Transportation Noise

Over the past 5 years the existing facility has averaged 8 to 27 railcars per day and 37 on-road trucks per day (ERM 2022). The proposed demolition and remediate the refinery site would result in an estimated 8 railcars per day for material hauling during the peak quarter, which is equivalent to or lower than historical use. On-road trucks associated with demolition/remediation activities would not exceed the 5-year average of 37 trucks per day. In comparison to historical operational activities, demolition/remediation activities would not be projected to result in an increase in rail or on-road truck usage. Typically, a doubling of source noise (e.g., truck/rail trips) would be required before a noticeable increase in ambient noise levels (i.e., 3 dBA, or greater) would occur. As a result, demolition/remediation activities would not be projected to result in increases in off-site transportation source noise levels.

Demolition/Remediation Groundborne Vibration

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely result in structural damage. For most structures, a threshold of 0.5 in/sec ppv is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile and historic structures, Caltrans recommends a threshold of 0.2 inches per second ppv (in/sec ppv). This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings (Caltrans 2020).

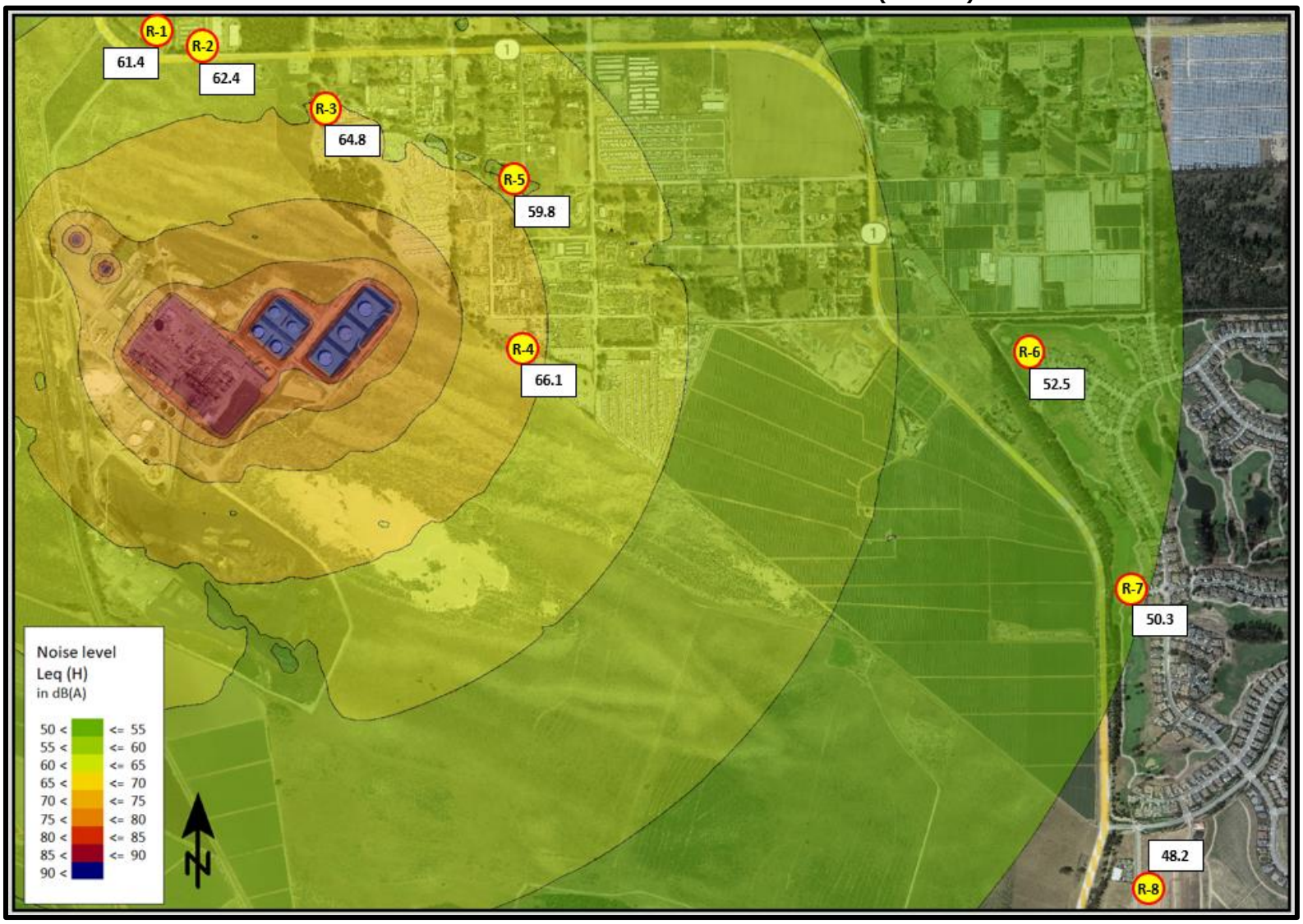
The nearest off-site structure is located approximately 1,100 feet from the nearest onsite demolition and remediation activities. Demolition and remediation activities are expected to require the use of various off-road equipment, such as tractors, hydraulic breaker rams, and material haul trucks. Groundborne vibration levels commonly associated with off-road equipment could reach up to 1.518 in/sec ppv at 25 feet (FTA 2018). Based on this level and assuming a distance of 1,100 feet predicted groundborne vibration levels at the nearest off-site structures would be approximately 0.011 in/sec ppv, or less. Groundborne vibration levels at the nearest off-site structures would not exceed the commonly applied criteria for 0.5 in/sec ppv for structural damage or 0.2 in/sec ppv for human annoyance. As a result, mitigation is not required.

SUMMARY OF FINDINGS & RECOMMENDATIONS

Based on the analysis conducted, demolition/remediation noise levels would not exceed commonly recommended screening criteria for noise or groundborne vibration. As a result, implementation of mitigation measures for noise and groundborne vibration impacts would not be required. However, depending on construction schedule and equipment usage, predicted noise levels could be detectable at the nearest residences, particularly those located east and north of the project site. To minimize levels of annoyance at these nearest residences, the following measures are recommended:

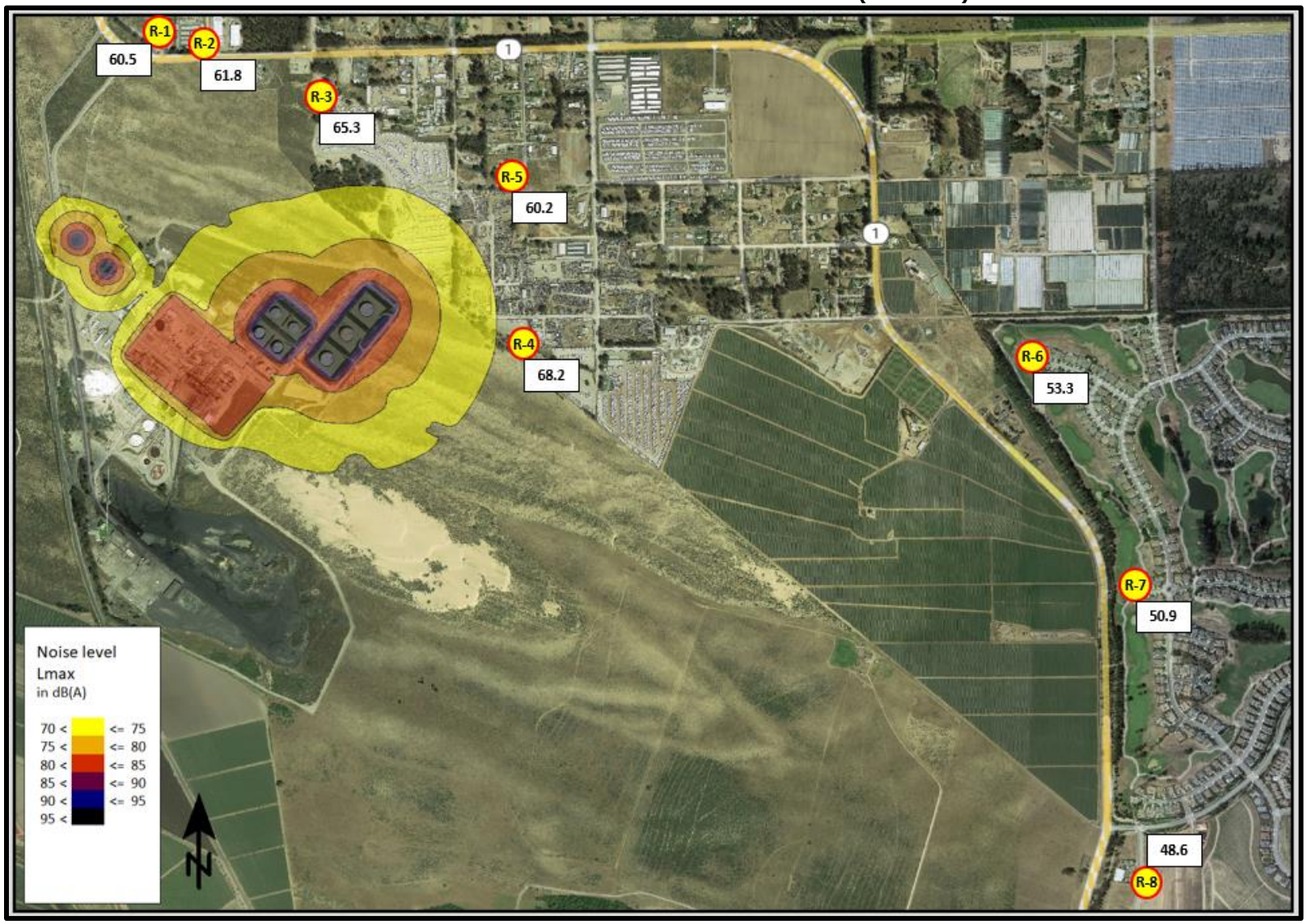
- Noise-generating activities should be limited to between the hours of 7:00 a.m. and 9:00 p.m. on weekdays, and between the hours of 8:00 a.m. and 5:00 p.m. on weekends, consistent with the hourly exemptions noted in the County's noise control ordinance for construction-related activities.
- Construction equipment should be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment-engine shrouds should be closed during equipment operation.
- On-site idling of off-road equipment and on-road haul trucks should be limited to a maximum of five minutes, except for equipment that requires idling to maintain performance.

FIGURE 3. HIGHEST PREDICTED AVERAGE-HOURLY NOISE LEVELS (DBA LEQ)



Noise levels and contours were calculated using the SoundPlan computer program assuming receiver would be placed at a height of approximately 5 feet above ground level. Locations are approximate.

FIGURE 4. HIGHEST PREDICTED INSTANTANEOUS NOISE LEVELS (DBA LMAX)



Noise levels and contours were calculated using the SoundPlan computer program assuming receiver would be placed at a height of approximately 5 feet above ground level. Locations are approximate.

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APPENDIX A

CONSTRUCTION NOISE & GROUNDBORNE VIBRATION MODELING

Groundborne Vibration Modeling

TABLE A-1. REPRESENTATIVE VIBRATION SOURCE LEVELS FOR TYPICAL CONSTRUCTION EQUIPMENT

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Vibratory Hammer	0.650
Hoe Ram	0.089
Large Bulldozers	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Source: Caltrans 2020	

TABLE A-2. PREDICTED VIBRATION LEVELS

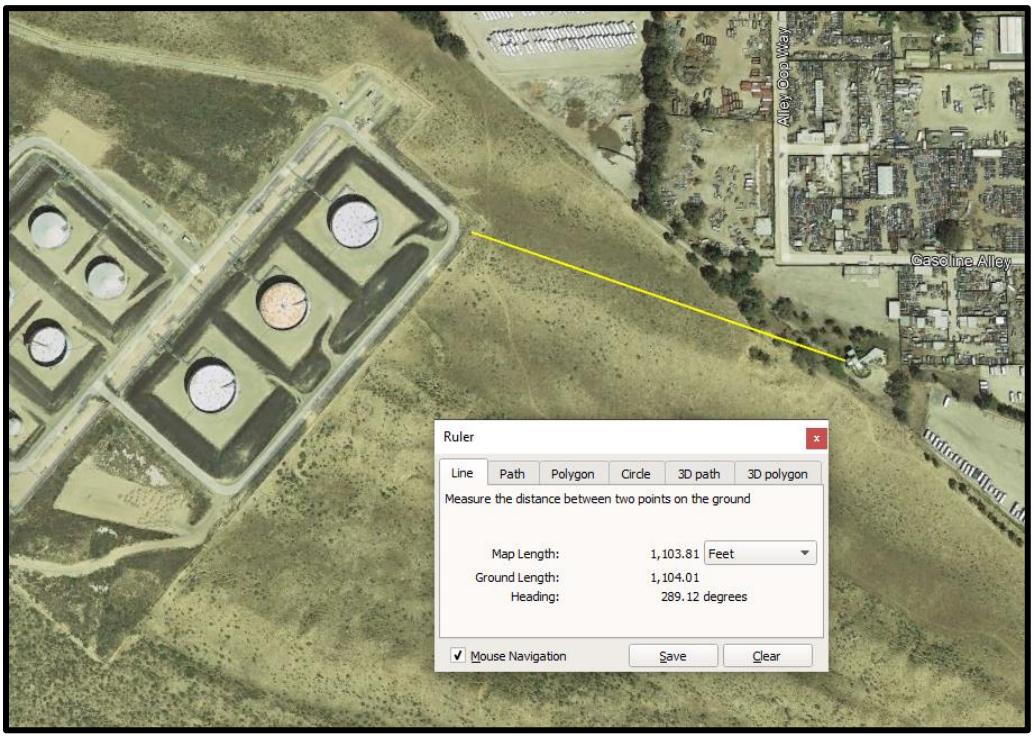
REFERENCE VIBRATION LEVELS	
PILE DRIVER-IMPACT	PPV IN/SEC AT 25 FT
UPPER RANGE	1.518
TYPICAL	0.644
PILE DRIVER-SONIC	
UPPER RANGE	0.734
TYPICAL	0.17
CLAM SHOVEL DROP (SLURRY WALL)	0.202
HYDROMILL (SLURRY WALL)	
IN SOIL	0.008
IN ROCK	0.017
VIBRATORY ROLLER	0.21
HOE RAM	0.089
LARGE BULLDOZER	0.089
CAISSON DRILLING	0.089
LOADED TRUCKS	0.076
JACKHAMMER	0.035
SMALL BULLDOZER	0.003

SOURCE:	Above Ground
REFERENCE LEVEL:	0.089
ATTENUATION RATE*:	1.3
DISTANCE	1100
PREDICTED GROUND-BORNE VIBRATION LEVEL:	0.001

SOURCE:	Below Ground
REFERENCE LEVEL:	1.518
ATTENUATION RATE*:	1.3
DISTANCE	1100
PREDICTED GROUND-BORNE VIBRATION LEVEL:	0.011

Note: Representative groundborne vibration levels not identified for concrete crusher/asphalt pulverizer plants. To be conservative, groundborne vibration levels for this equipment was calculated based on the highest groundborne vibration levels identified for impact pile driving, which is anticipated to be substantially higher.

Distance from on-site vibration activities to nearest residence.



SoundPlan Noise Modeling Assumptions

Project Description

Project Title: Phillips 66 2.4

Run Description

Calculation type: Grid Map
Run file: RunFile.runx
Result number: 11
Calculation start: 1/26/2023 3:39:14 PM
Calculation end: 1/26/2023 3:40:51 PM
Calculation time: 01:34:135 [m:s:ms]
No. of points: 104052
No. of calculated points: 104052
Kernel version: SoundPLAN 8.2 (1/19/2023) - 32 bit

Run Parameters

Reflection order: 3
Search radius 5000 m
Weighting: dB(A)
Allowed tolerance: 0.100 dB

Standards:
- Industry: ISO 9613-2: 1996
- Air absorption: ISO 9613-1

regular ground effect (chapter 7.3.1), for sources without a spectrum automatically alternative ground effect

- Limitation of screening loss:
  - single/multiple 20.0 dB /25.0 dB
- Environment:
  - Air pressure 1013.3 mbar
  - Meteo. corr. C0(7-22h)[dB]=0.0; C0(22-7h)[dB]=0.0;
- Parameter for screening: C2=20.0

Dissection parameters:
- Distance to diameter factor: 8
- Minimal distance: 1 m
- Max. difference ground effect + diffraction: 1.0 dB
- Max. number of iterations: 4

Attenuation
- Foliage: ISO 9613-2
- Built-up area: ISO 9613-2
- Industrial site: ISO 9613-2

Assessment: Day Night Level LDN, Lmax

Grid Noise Map:
- Grid space: 10.00 m
- Height above ground: 1.500 m
- Grid interpolation:
  - Field size = 9x9
  - Min/Max = 10.0 dB
  - Difference = 0.1 dB
  - Limit level= 40.0 dB

Geometry Data

Phillips 66 Model 2.0.sit 1/26/2023 3:38:22 PM
- contains:
  - Geo-File2.geo 1/26/2023 3:38:22 PM
  - Imported elevation points3.geo 1/25/2023 11:54:12 AM
  - Imported elevation points12.geo 1/24/2023 12:58:14 PM
  - Imported elevation points13.geo 1/24/2023 12:58:14 PM
  - Imported elevation points14.geo 1/24/2023 1:47:00 PM

RDGM0002.dgm 1/26/2023 9:48:50 AM

Source Noise Levels

TABLE A-3. ABOVE GROUND PHASE AT 61 M

	Lmax	**Leq**
Total	68.6	71.9
Front End Loader	67.1	63.1
Front End Loader	67.1	63.1
Generator	68.6	65.6
Dump Truck	64.4	60.4
Man Lift	62.7	55.7
Man Lift	62.7	55.7
Crane	68.5	60.6
Crane	68.5	60.6
Generator	68.6	65.6

Based on anticipated equipment for the project and sound levels from RCNM.

TABLE A-4. BELOW GROUND PHASE AT 61 M

	Lmax	Leq
Total	78.0	74.0
Hydra Break Ram	78.0	68.0
Excavator	68.7	64.7
Excavator	68.7	64.7
Excavator	68.7	64.7
Front End Loader	67.1	63.1
Generator	68.6	65.6
Auger Drill Rig	72.3	65.3
Dump Truck	64.4	60.4
Based on anticipated equipment for the project and sound levels from RCNM.		

TABLE A-5. ROCK CRUSHER AND ASPHALT PULVERIZER AT 30.5 M

Octave Hz	dBA	Lmax	Leq
16	-6.1	83.6	75.9
31.5	12.4		
63	33.3		
125	53.3		
250	44.7		
500	50.7		
1000	50.8		
2000	50		
4000	45.4		
8000	40.2		
16000	22.9		
Based on anticipated equipment for the project and sound levels from LSA.			

Receptor Locations and Source Contributions

SLO - Phillips 66
Contribution level - Phillips 66 2.4 single points 9

Source	Source group	Source type	Lmax dB(A)	Leq (H) dB(A)	
Receiver R-1 Fl G X 10719758.87 m Y 3881051.49 m Lmax,lim dB(A) Lmax 60.5 dB(A) Leq (H) 61.4 dB(A)					
Below Ground 1	Default industrial noise	Area	60.5	56.5	
Below Ground 2	Default industrial noise	Area	60.4	56.4	
Above Ground	Default industrial noise	Area	53.3	56.6	
Crusher 1	Default industrial noise	Point	49.7	41.9	
Asphalt Pulverizer1	Default industrial noise	Point	48.6	40.8	
Receiver R-2 Fl G X 10719873.76 m Y 3880981.56 m Lmax,lim dB(A) Lmax 61.7 dB(A) Leq (H) 62.4 dB(A)					
Below Ground 1	Default industrial noise	Area	61.7	57.7	
Below Ground 2	Default industrial noise	Area	61.6	57.6	
Above Ground	Default industrial noise	Area	54.1	57.4	
Crusher 1	Default industrial noise	Point	49.7	41.9	
Asphalt Pulverizer1	Default industrial noise	Point	48.4	40.6	
Receiver R-3 Fl G X 10720229.70 m Y 3880815.93 m Lmax,lim dB(A) Lmax 65.3 dB(A) Leq (H) 64.8 dB(A)					
Below Ground 1	Default industrial noise	Area	65.3	61.3	
Below Ground 2	Default industrial noise	Area	64.0	60.0	
Above Ground	Default industrial noise	Area	55.1	58.4	
Crusher 1	Default industrial noise	Point	47.3	39.5	
Asphalt Pulverizer1	Default industrial noise	Point	47.7	39.9	
Receiver R-4 Fl G X 10720804.11 m Y 3880106.64 m Lmax,lim dB(A) Lmax 68.2 dB(A) Leq (H) 66.1 dB(A)					
Below Ground 1	Default industrial noise	Area	68.2	64.2	
Below Ground 2	Default industrial noise	Area	63.6	59.6	
Above Ground	Default industrial noise	Area	54.2	57.5	
Crusher 1	Default industrial noise	Point	42.0	34.2	
Asphalt Pulverizer1	Default industrial noise	Point	42.9	35.1	
Receiver R-5 Fl G X 10720775.79 m Y 3880595.69 m Lmax,lim dB(A) Lmax 60.2 dB(A) Leq (H) 59.7 dB(A)					
Below Ground 1	Default industrial noise	Area	60.2	56.2	
Below Ground 2	Default industrial noise	Area	58.4	54.4	
Above Ground	Default industrial noise	Area	50.6	53.9	
Crusher 1	Default industrial noise	Point	41.2	33.4	
Asphalt Pulverizer1	Default industrial noise	Point	41.8	34.0	
Receiver R-6 Fl G X 10722279.50 m Y 3880078.64 m Lmax,lim dB(A) Lmax 53.3 dB(A) Leq (H) 52.5 dB(A)					
Below Ground 1	Default industrial noise	Area	53.3	49.3	
Below Ground 2	Default industrial noise	Area	50.8	46.8	
Above Ground	Default industrial noise	Area	43.0	46.3	
Crusher 1	Default industrial noise	Point	32.8	25.0	
Asphalt Pulverizer1	Default industrial noise	Point	33.3	25.5	
Receiver R-7 Fl G X 10722565.42 m Y 3879412.97 m Lmax,lim dB(A) Lmax 50.9 dB(A) Leq (H) 50.3 dB(A)					
Below Ground 1	Default industrial noise	Area	50.9	46.9	
Below Ground 2	Default industrial noise	Area	48.7	44.7	
Above Ground	Default industrial noise	Area	41.2	44.5	
Crusher 1	Default industrial noise	Point	31.6	23.8	
Asphalt Pulverizer1	Default industrial noise	Point	32.1	24.3	
Receiver R-8 Fl G X 10722615.02 m Y 3878540.45 m Lmax,lim dB(A) Lmax 48.6 dB(A) Leq (H) 48.2 dB(A)					

Source	Source group	Source type	Lmax dB(A)	Leq (H) dB(A)	
Below Ground 1	Default industrial noise	Area	48.6	44.6	
Below Ground 2	Default industrial noise	Area	46.6	42.6	
Above Ground	Default industrial noise	Area	39.4	42.7	
Crusher 1	Default industrial noise	Point	30.2	22.4	
Asphalt Pulverizer1	Default industrial noise	Point	30.6	22.8	

Source Locations

SLO - Phillips 66
Octave spectra of the sources in dB(A) - Phillips 66 2.4 single points

Name	Source type	X	Y	l or A	L'w	Lw	LwMax	Time histogram	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
		m	m	m,m²	dB(A)	dB(A)	dB(A)			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Above Ground	Area	10719861.97	3880044.29	86753.42	82.0	131.4	128.1	100%/24h					131.4				
Asphalt Pulverizer1	Point	10719594.21	3880326.87		119.0	119.0	126.8	100%/24h	Crusher 1	94.3	114.3	105.7	111.7	111.8	111.0	106.4	101.2
Below Ground 1	Area	10720306.10	3880149.41	26079.18	87.6	131.8	135.8	100%/24h					131.8				
Below Ground 2	Area	10720101.52	3880158.60	15547.50	88.7	130.6	134.6	100%/24h					130.6				
Crusher 1	Point	10719510.45	3880411.62		119.0	119.0	126.8	100%/24h	Crusher 1	94.3	114.3	105.7	111.7	111.8	111.0	106.4	101.2

APPENDIX B

AMBIENT NOISE MONITORING DATA

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	12/5/2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	SAN LUIS OBISPO COUNTY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 58-59 F. | HUMIDITY: 70-74 % | WIND SPEED: 1-5 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	LXT			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT		DURATION			MEASURED NOISE LEVELS		
LOCATION	DATE/TIME	(Minutes)	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	LEQ	LMAX	
1	1:08-1:18	10	931 Sheridan Rd	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	45.5	64.2	
2	1:24-1:34	10	Arriba Pl east of Sheridan Rd	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	54.7	65.7	
3	1:43-1:53	10	Winterhaven Way south of Willow Rd	Traffic on Willow Rd, Distance Const Activities	52.7	72.6	
4	1:59-2:09	10	Alley Oop Way at Gasoline Alley	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	51.2	71.8	
5	2:25-2:35	10	North of Hwy 1 north side of Calendar Loop Path, ~215' from SR1 centerline	Traffic on SR1	53.2	58.9	
6	2:41-2:51	10	SR1 east of Sheridan, ~50' from road Centerline	Traffic on SR1	70.7	80.5	
7	2:55-3:05	10	Willow Rd east of SR1, ~52' from road centerline	Traffic on Willow Rd	68.4	77.5	

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	12/7-8/2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	SAN LUIS OBISPO COUNTY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP:53-56 F. | HUMIDITY: 67-72 % | WIND SPEED: 1-6 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	SLM MODEL:	LARDAV LXT, SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

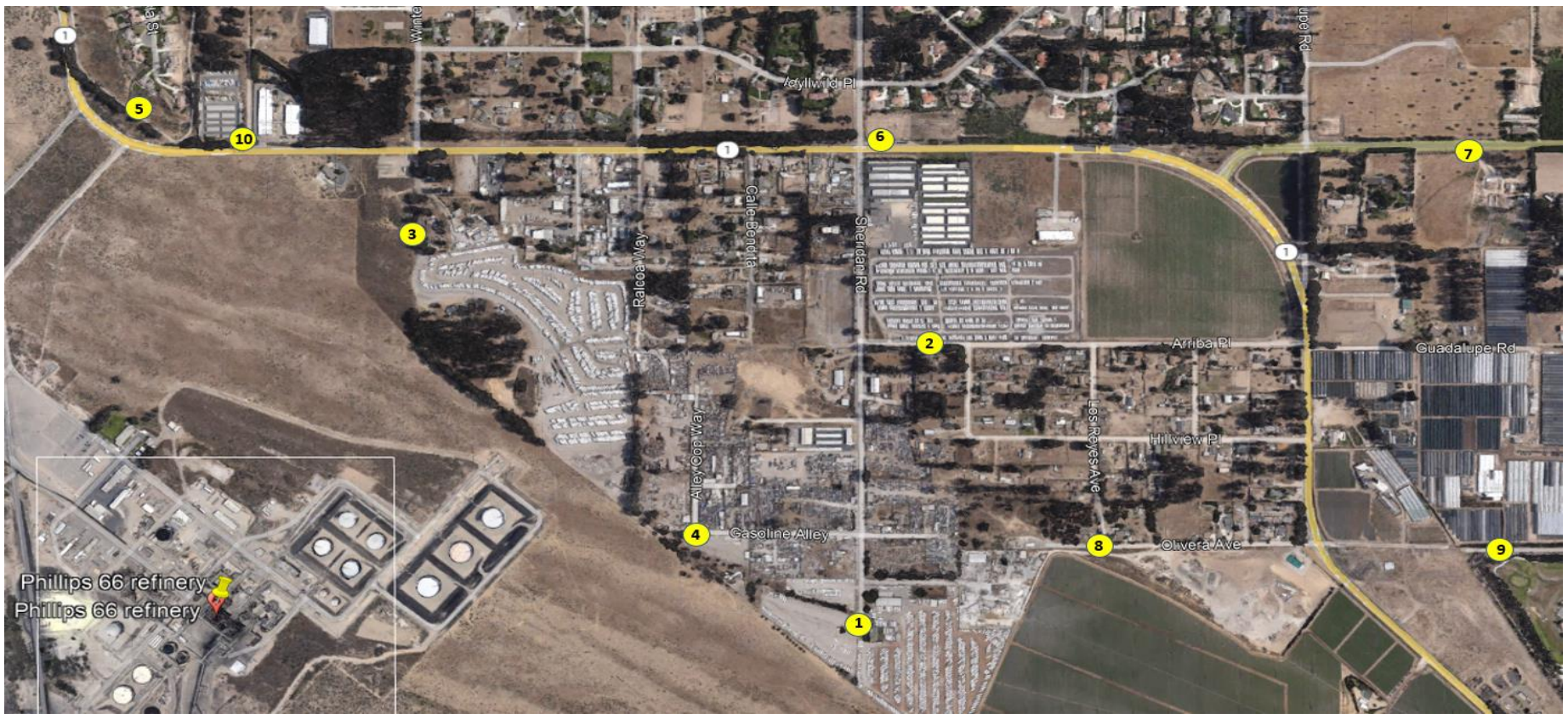
MEASUREMENT		DURATION			MEASURED NOISE LEVELS		
LOCATION	DATE/TIME	(Minutes)	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	LEQ	LMAX	
1	12/07 11:05-11:15	10	931 Sheridan Rd	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	52.8	76.4	
2	NOT MEASURED						
3	12/07 10:15-10:25	10	Winterhaven Way south of Willow Rd	Traffic on Willow Rd, Distance Landscaping Activities	52.8	80.9	
4	12/07 11:21-11:31	10	Alley Oop Way at Gasoline Alley	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	54.7	67.2	
5	12/07 10:45-10:55	10	North of Hwy 1 north side of Calendar Loop Path, ~215' from SR1 centerline	Traffic on SR1	54.6	77.3	
6	NOT MEASURED						
7	NOT MEASURED						
8	12/07 11:21-11:31	10	Olivera Ave. West of Hwy 1	Traffic on SR1 Primary. Chickens background	47.2	66.5	
9	12/08 10:50-11:00	10	Dawn Rd, East of Hwy 1	Traffic on SR1 Primary. Chickens, distant industrial activities background	53.4	61.2	

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	12/16/2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	SAN LUIS OBISPO COUNTY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:



NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP:56-60 F. | HUMIDITY: 63-68 % | WIND SPEED: 1-5 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	SLM MODEL:	LARDAV LXT, SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):	5	
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

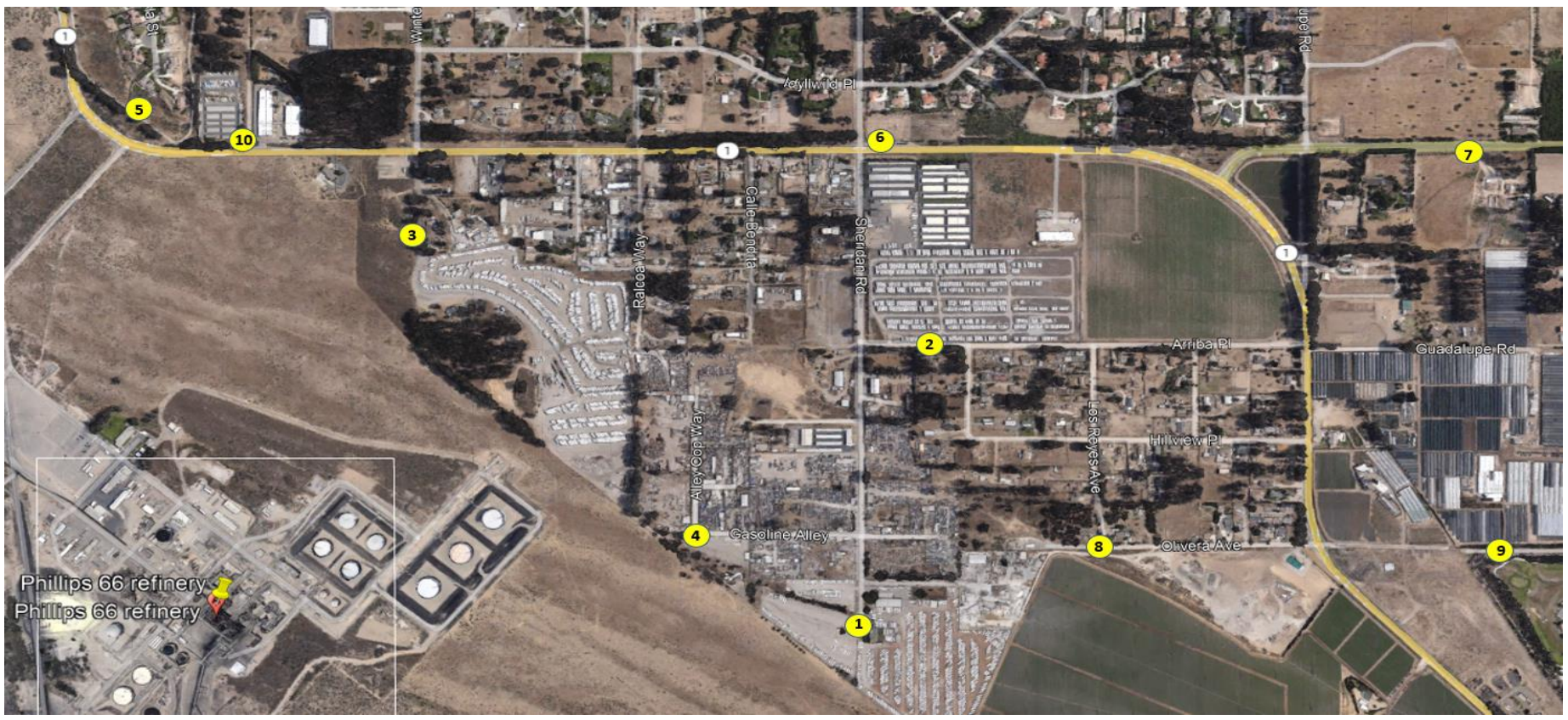
MEASUREMENT		DURATION			MEASURED NOISE LEVELS		
LOCATION	DATE/TIME	(Minutes)	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	LEQ	LMAX	
1	1106-1116	10	931 Sheridan Rd	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	56.8	68.4	
2	NOT MEASURED						
3	1026-1036	10	Winterhaven Way south of Willow Rd	Traffic on Willow Rd/Hwy 1	49.5	56.9	
4	1050-1100	10	Alley Oop Way at Gasoline Alley	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	52.4	67.9	
5	NOT MEASURED						
6	NOT MEASURED						
7	NOT MEASURED						
8	NOT MEASURED						
9	0920-0930	10	Dawn Rd, East of Hwy 1	Traffic on SR1 Primary. Chickens, distant	55	60.5	

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	12/17/2022 (SATURDAY)
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	SAN LUIS OBISPO COUNTY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:



NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP:56-60 F. | HUMIDITY: 63-68 % | WIND SPEED: 1-5 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	SLM MODEL:	LARDAV LXT, SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):	5	
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT		DURATION			MEASURED NOISE LEVELS		
LOCATION	DATE/TIME	(Minutes)	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	LEQ	LMAX	
1	0856-0906	10	931 Sheridan Rd	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	51.3	69.4	
2	0934-0944	10	Residential Dwelling on Aribba Ct	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	51.4	53.2	
3	0830-0840	10	Winterhaven Way south of Willow Rd	Traffic on Willow Rd/Hwy 1	51.3	77.4	
4	0916-0926	10	Alley Oop Way at Gasoline Alley	Nearby Industrial Activities/Backup Beepers, Vehicles on Nearby Roads	48.2	62.8	
5	NOT MEASURED						
6	NOT MEASURED						
7	NOT MEASURED						
8	NOT MEASURED						
9	1015-1025	10	Dawn Rd, East of Hwy 1	Traffic on SR1 Primary. Chickens distant	51.8	59.3	

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 16-19, 2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	PHILLIPS 66 REFINERY NORTHERN PLANT BOUNDARY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:

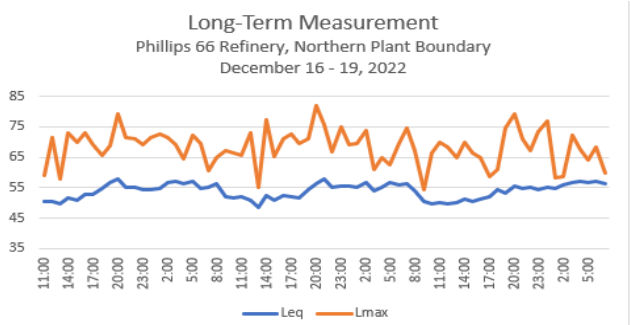
Measurement Location

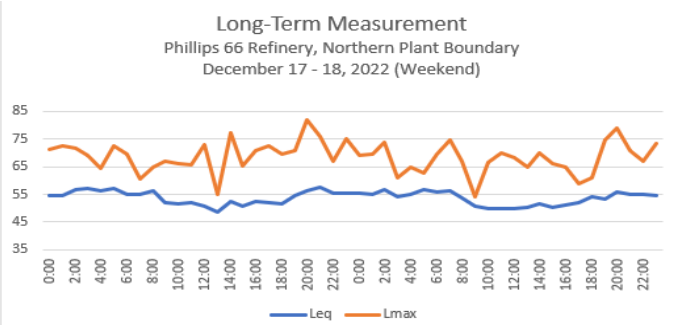
NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 36-62 F. | HUMIDITY: 60-86 % | WIND SPEED: 1-7 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
1	Dec 16 -19	Phillips 66 Refinery, Northern Plant Boundary	Plant operations primary.	SEE BELOW	SEE BELOW	





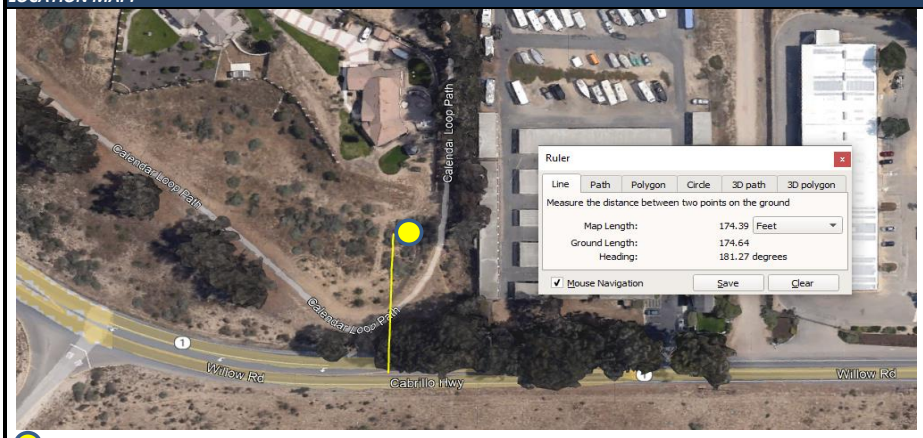
		LOW	HIGH
WEEKDAY	DAYTIME LEQ	50	58
	NIGHTTIME LEQ	54	57
	DAYTIME LMAX	58	79
	NIGHTTIME LMAX	58	77
WEEKEND	DAYTIME LEQ	48	58
	NIGHTTIME LEQ	54	57
	DAYTIME LMAX	55	82
	NIGHTTIME LMAX	61	75

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 6-8, 2022 (WEEKDAY)
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	RESIDENTIAL LAND USES NORTH OF SR1/PHILLIPS 66 REFINERY
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:



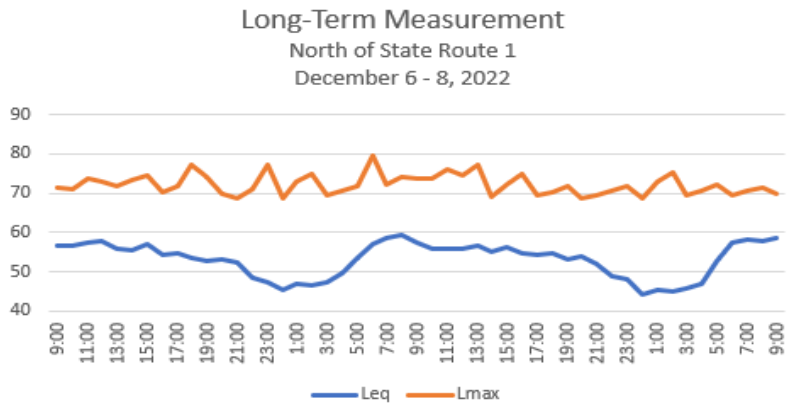
Measurement Location

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 38-58 F. | HUMIDITY: 60-75 % | WIND SPEED: 1-6 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
2	Dec 6 - 8	North of SR1, ~175 from SR1 centerline	Traffic on SR1 primary.	SEE BELOW	SEE BELOW	



	LOW	HIGH
DAYTIME LEQ	52	59
NIGHTTIME LEQ	44	58
DAYTIME LMAX	69	77
NIGHTTIME LMAX	69	77

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 6-8, 2022 (WEEKDAY)
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	WINTERHAVEN DR, SOUTH OF SR1/WILLOW RD
MONITORING STAFF:	KURT LEGLEITER

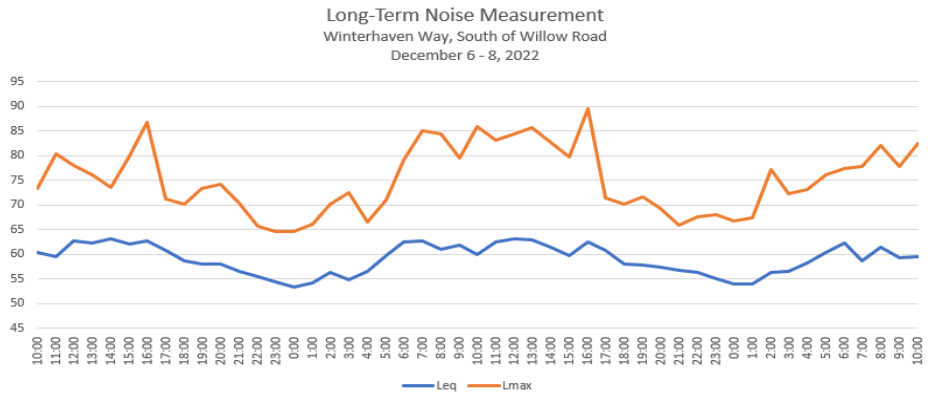
LOCATION MAP:

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 38-58 F. | HUMIDITY: 60-75 % | WIND SPEED: 1-6 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
3	Dec 6 - 8	Winterhaven Way south of SR1, ~465' from SR1 centerline	Traffic on SR1 primary. Occassional vehicle passbys on Winterhaven. Distant landscaping activities.	57-63	53-63	



	LOW	HIGH
DAYTIME LEQ	57	63
NIGHTTIME LEQ	53	63
DAYTIME LMAX	66	89
NIGHTTIME LMAX	65	82

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 17-18, 2022 (WEEKEND)
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	WINTERHAVEN DR., SOUTH OF SR1/WILLOW RD
MONITORING STAFF:	KURT LEGLEITER

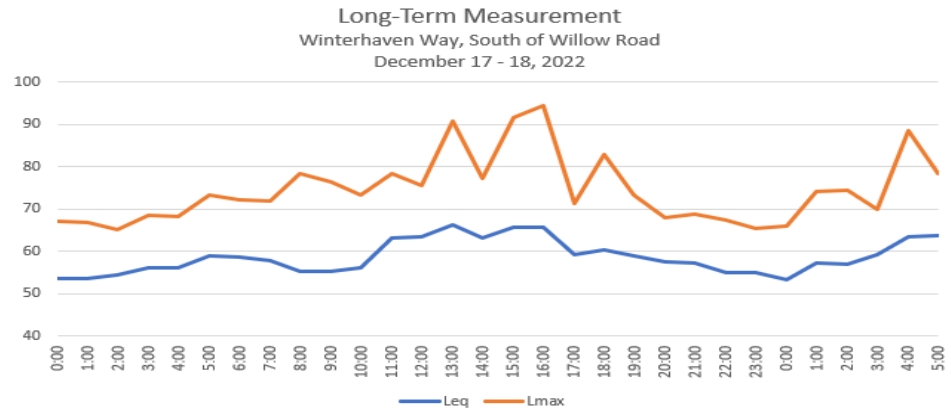
LOCATION MAP:

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 36-62 F. | HUMIDITY: 60-90 % | WIND SPEED: 1-7 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
3	Dec 6 - 8	Winterhaven Way south of SR1, ~465' from SR1 centerline	Traffic on SR1 primary. Occassional vehicle passbys on Winterhaven. Activities at nearby land uses.	55-64	53-64	



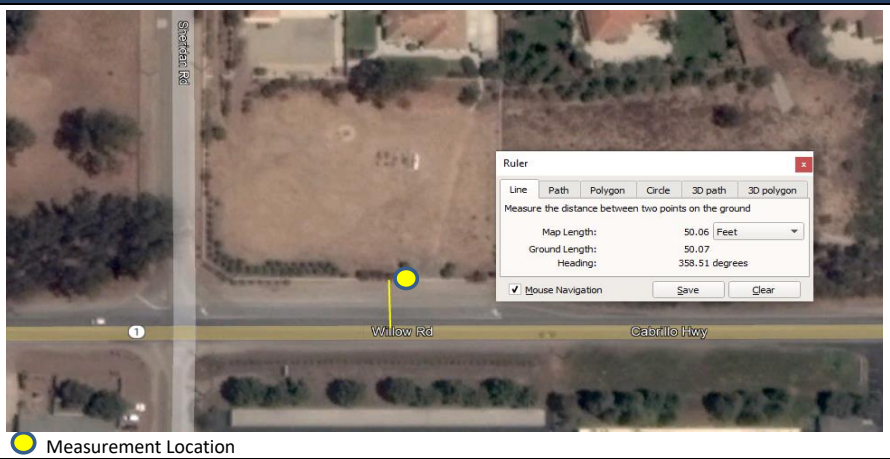
	LOW	HIGH
DAYTIME LEQ	55	66
NIGHTTIME LEQ	53	64
DAYTIME LMAX	68	94
NIGHTTIME LMAX	65	89

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 8-9, 2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	STATE ROUTE 1
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:



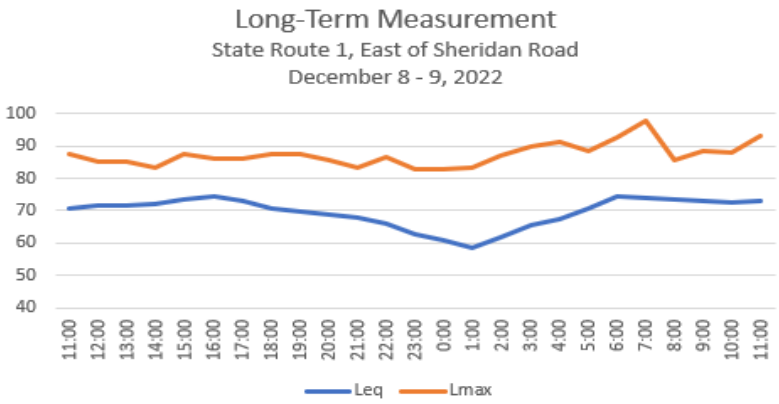
Measurement Location

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 36-61 F. | HUMIDITY: 60-70 % | WIND SPEED: 1-6 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
4	Dec 8-9	SR 1, east of Sheridan Rd. ~50' from SR1 centerline.	Traffic on SR1	SEE BELOW	SEE BELOW	



		LOW	HIGH
WEEKDAY	DAYTIME LEQ	68	74
	NIGHTTIME LEQ	59	74
	DAYTIME LMAX	83	98
	NIGHTTIME LMAX	83	93

NOISE MEASUREMENT SURVEY FORM

SHEET	1	OF	1

DATE:	DEC 15-16, 2022
PROJECT:	PHILLIPS 66 REFINERY
LOCATION:	WILLOW ROAD
MONITORING STAFF:	KURT LEGLEITER

LOCATION MAP:

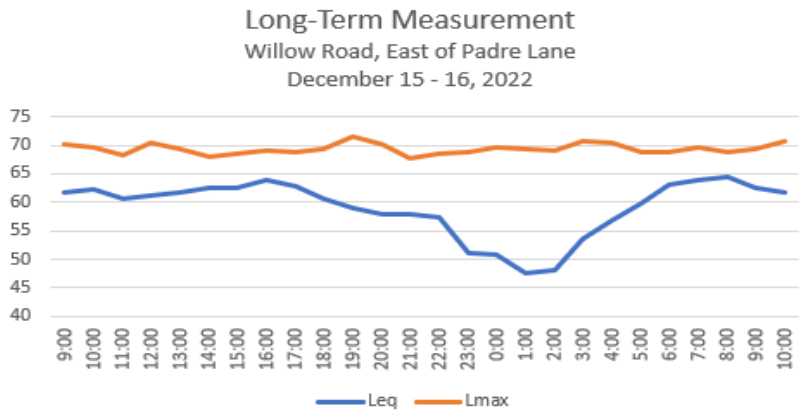
Measurement Location

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 35-62 F. | HUMIDITY: 65-85 % | WIND SPEED: 1-7 MPH | SKY: 2 | GROUND: DRY				
	CLOUD COVER BY CLASS (OC=OVERCAST):		(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	KESTREL 5500			
NOISE MONITORING EQUIPMENT:	LARSON DAVIS SLM MODEL:	SOFTdB PICCOLO			
	CALIBRATOR:	CAL200			
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	YES	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT				HOURLY NOISE LEVELS		
LOCATION	DATE/TIME	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	DAY LEQ	NIGHT LEQ	
5	Dec 15-16	Willow Rd east of Padre Ln. ~80' from Willow Rd CL	Traffic on Willow Rd	SEE BELOW	SEE BELOW	



		LOW	HIGH
WEEKDAY	DAYTIME LEQ	58	64
	NIGHTTIME LEQ	48	63
	DAYTIME LMAX	68	72
	NIGHTTIME LMAX	68	71