Stantec **Memo**

To:	Scott Novak Chevron Renewables	From:	Stantec
File:	Chevron Perris Hydrogen Fueling Station	Date:	December 19, 2023

Reference: Noise Technical Memo for Chevron Perris Hydrogen Fueling Station

INTRODUCTION

NOISE TECHNICAL MEMO PURPOSE

The purpose of this Noise Technical Memo is to support the Chevron Perris Hydrogen Fueling Station (proposed Project) CEQA documentation. This memo provides analyses of potential project-related impacts for exposure to excessive noise during construction and operation. This memo has been prepared to analyze the potential construction-related noise impacts generated form the proposed projects and estimate the potential operational noise conditions located at the project site. This memo will be used as a supplementary analysis to the CEQA documentation.

Specifically, the purpose of this memo is to assess the existing ambient noise conditions at the nearest sensitive receptors and within the proposed project area. This memo includes an evaluation of the proposed noise-generating uses that could affect offsite noise-sensitive receptors as well as assessing the potential indoor noise conditions affecting occupants of the proposed project site.

One source of noise generation associated with commercial development projects is project construction activities. This includes site grading, construction of the building, and increased traffic related to worker trips and material delivery. Operational noise from a commercial development can be attributed to an increase of traffic count from employees as well as from fixed mechanical equipment used to operate the building.

PROJECT DESCRIPTION AND LOCATION

The Perris Hydrogen Fueling Station Project (Project) consists of the instillation of a new hydrogen fueling facility, diesel fuel dispensers, and compressed natural gas (CNG) dispensers at an existing Chevron fueling facility, located at 4063 North Webster Avenue, Perris, California. The proposed Project would be similar in construction and appearance to the existing gasoline fueling station. The Project would include two new CNG dispensers, four new diesel fuel dispensers, and three hydrogen dispensers.

NOISE FUNDAMENTALS AND TERMINOLOGY

Noise is generally defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level (SPL) is the most common descriptor used to characterize the loudness of an existing sound level.

Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dB(A) and referred to as A-weighted decibels. There is a strong correlation between A-weighted sound levels and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. Table 1 summarizes typical A-weighted sound levels for different common noise sources.

Table 1: Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	-110-	Rock band
Jet flyover at 1,000 Feet		
	-100-	
Gas lawnmower at 3 Feet		
	-90-	
Diesel truck at 50 Feet at 50 MPH		Food blender at 3 Feet
Noisy urban area, daytime	-80-	Garbage Disposal at 3 Feet
Gas lawnmower, 100 Feet		
Commercial area	-70-	Vacuum Cleaner at 10 Feet
Heavy traffic at 300 Feet		Normal Speech at 3 Feet
	-60-	
Quiet urban daytime		Large business office
	-50-	Dishwasher in next room
Quiet urban nighttime		
Quiet suburban nighttime	-40-	Theater, large conference room (Background)
Quiet rural nighttime	-30-	
		Library
	-20-	Bedroom at night, concert hall (Background)
	-10-	
		Broadcast/recording studio
	-0-	

Source: Caltrans, Technical Noise Supplement Traffic Noise Analysis Protocol, September 2013 (https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf)

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (Leq), the minimum and maximum sound levels (Lmin and Lmax), percentile-exceeded sound levels (such as L10, L20), the day-night sound level (Ldn), and the community noise equivalent level (CNEL). Ldn and CNEL values often differ by less than 1 dB. As a matter of practice, Ldn and CNEL values are considered to be equivalent and are treated as such in this assessment. Table 2 defines sound measurements and other terminology used in this report.

Table 2: Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dB(A))	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Maximum Sound Level (Lmax)	The maximum sound level measured during the measurement period.
Minimum Sound Level (Lmin)	The minimum sound level measured during the measurement period.
Equivalent Sound Level (Leq)	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (Lxx)	The sound level exceeded xx % of a specific time period. L10 is the sound level exceeded 10% of the time. L90 is the sound level exceeded 90% of the time. L90 is often considered to be representative of the background noise level in a given area.
Day-Night Level (Ldn)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Peak Particle Velocity (Peak Velocity or PPV)	A measurement of ground vibration defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches/second.
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Source: Federal Highway Administration Construction Noise Handbook, 2006[1]

With respect to how humans perceive and react to changes in noise levels, a 1 dB(A) increase is imperceptible, a 3 dB(A) increase is barely perceptible, a 5 dB(A) increase is clearly noticeable, and a 10 dB(A) increase is subjectively perceived as approximately twice as loud. These subjective reactions to changes in noise levels were developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. These statistical indicators are thought to be most applicable to noise levels in the range of 50 to 70 dB(A), as this is

[1] https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook02.cfm, Last Accessed October 24, 2023.

the usual range of voice and interior noise levels. Numbers of agencies and municipalities have developed or adopted noise level standards, consistent with these and other similar studies to help prevent annoyance and to protect against the degradation of the existing noise environment.

For a point source such as a stationary compressor or construction equipment, sound attenuates based on geometry at a rate of 6 dB per doubling of distance. For a line source such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance. Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface, such as grass, attenuates at a slightly greater rate than sound that travels over a hard surface, such as pavement. The increased attenuation is typically in the range of 1–2 dB per doubling of distance. Barriers, such as buildings and topography that block the line of sight between a source and receiver, also increase the attenuation of sound over distance.

Decibel Addition

Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted through ordinary arithmetic. On the dB 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, their combined sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one source produces a sound pressure level of 70 dB(A), two identical sources would combine to produce 73 dB(A). The cumulative sound level of any number of sources can be determined using decibel addition.

Vibration Standards

Vibration is like noise such that it involves a source, a transmission path, and a receiver. While related to noise, vibration differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system that is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocity in inches per second (in/sec PPV). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of in/sec PPV.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3 notes the general threshold at which human annoyance could occur is 0.1 PPV for continuous/frequent sources. Table 4 indicates the threshold for damage to typical residential and commercial structures ranges from 0.3 to 0.5 PPV for continuous/frequent sources.

Table 3: Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Sources
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.90	0.10
Severe	2.0	0.40

Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seal equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, April 2020[2]

Table 4: Guideline Vibration Damage Potential Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.30	0.12
Historic and some old buildings	0.50	0.20
Older residential structure	0.70	0.30
New residential structures	1.2	0.50
Modern industrial/commercial buildings	2.0	0.50

Notes: Transient sources again create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seal equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, April 2020

The operation of heavy construction equipment, particularly pile driving, and other impact devices, such as pavement breakers, create seismic waves that radiate along the surface of the ground and downward into the earth. These surface waves can be felt as ground vibration. Vibration from the operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and

[2] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf, Last Accessed October 24, 2023.

distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance. Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities.

Table 7-4 "Vibration Source Levels for Construction Equipment" in the 2018 Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (FTA Report No. 0123 September 2018). lists vibration source levels for the construction equipment most likely to generate high levels of ground vibration. The equipment listed in the FTA table includes impact and sonic pile drivers, clam shovel drops, hydromills, vibratory rollers, hoe rams, large and small bulldozers, caisson drilling, loaded trucks, and jackhammers. Table 5 below summarizes typical reference vibration levels generated by select construction equipment proposed for this Project.

Table 5: Reference Vibration Source Levels for Construction Equipment

Equipment	PPVref at 25 Feet
Large bulldozer	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Source: Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, September 2018[3]

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions (Federal Transit Administration 2018). "PPVref" is the reference PPV from Table 5 and "Distance" is the distance between the source and the receptor:

PPV = PPVref x (25/Distance)^1.5

REGULATORY SETTING

Federal, state, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets standards for transportation-related noise sources closely linked to interstate commerce, including aircraft, locomotives, and trucks. No federal noise standards are directly applicable to this project. The state government sets standards for transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. Local general plans identify general principles intended to guide and influence development plans.

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[3] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf, Last Accessed January 21, 2022.

STATE REGULATIONS

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicates a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels.

LOCAL REGULATIONS

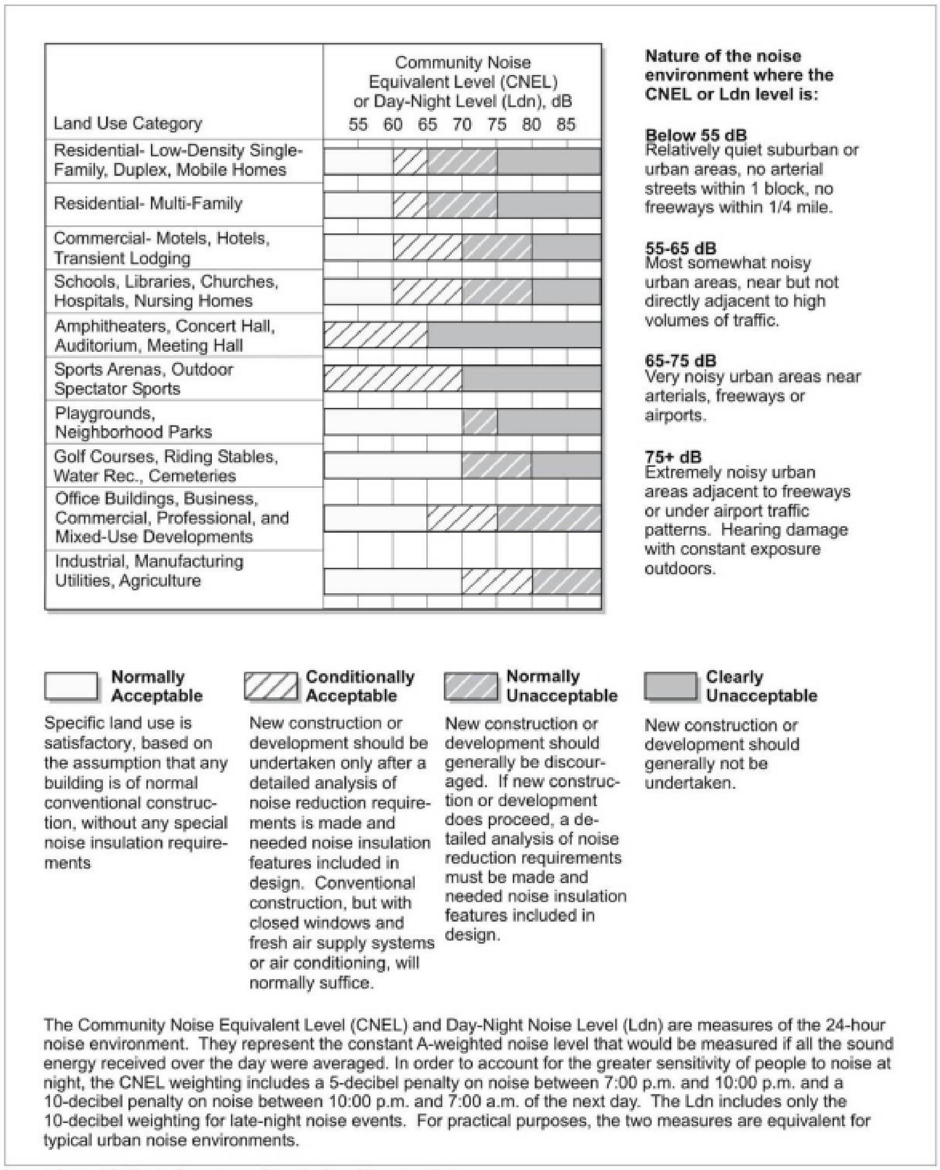
City of Perris Comprehensive General Plan 2030

The General Plan is a 30-year guide for local government decision on growth, capital investment, and physical development in the City of Perris. It guides future development plans and gives direction on how to make the future happen. The Noise Element in the City of Perris General Plan "identifies both stationary and mobile noise sources in the City which include: vehicle traffic; air traffic; the railroad; Perris Auto Speedway; March Inland Port; and the Perris Valley Airport and Skydiving Center." The Element identifies land use compatibility noise guidelines for varying land uses affected by transportation and non-transportation noise sources. As shown in Figure 1 below, for commercial buildings, the "Normally Acceptable" exterior noise levels is up to 65 dB(A) Ldn. Exterior noise levels up to 75 dB(A) Ldn are considered "Conditionally Acceptable" and should be undertaken only after a detailed analysis of the noise reduction requirements are made. Exterior noise levels above 75 dB(A) Ldn are considered "Normally Unacceptable" and those above 80 dB(A) are "clearly unacceptable". New construction with exterior noise levels in this range would require a detailed analysis of the noise reduction requirements and noise insulation features to be incorporated in the project to maintain "Normally Acceptable" interior noise levels.

Reference: **Noise Technical Memo for Chevron Perris Hydrogen Fueling Station**

Figure 1: City of Perris Land Use/Noise Compatibility Guidelines

Exhibit N-1: Land Use/Noise Compatibility Guidelines



City of Perris Code of Ordinances

Chapter 7.34 “Noise Control” in the City of Perris Code of Ordinances lists general prohibited noises in Section 7.34.050. The section states *“It unlawful for any person to willfully make, cause or suffer, or permit to be made or caused, any loud excessive or offensive noises or sounds which unreasonably disturb the peace and quiet of any residential neighborhood or which are physically annoying to persons of ordinary sensitivity or which are so harsh, prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of the city, or any section thereof. The standards for dB(A) noise level in Section 7.34.040 shall apply to this section. To the extent that the noise created causes the noise level at the property line to exceed the ambient noise level by more than 1.0 decibels, it shall be presumed that the noise being created also is in violation of this section.”*

Section 7.34.040 “Sound Amplification” lists the following restrictions on noise levels:

Time Period	Maximum Noise Level
10:01 p.m.—7:00 a.m.	60 dBA
7:01 a.m.—10:00 p.m.	80 dBA

Section 7.34.060 “Construction Noise” states that “It is unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect, construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dB(A) in residential zones in the city.”

EXISTING AMBIENT NOISE LEVELS

The existing, or ambient, noise environment in a project area is characterized by the area’s general level of development. Areas which are not urbanized are relatively quiet, while areas which are more urbanized are noisier as a result of roadway traffic, industrial activities, and other human activities.

As stated in the General Plan, the City of Perris is exposed to several sources of noise, including vehicle traffic on I-215 and arterial roadways; air traffic; the railroad; Perris Auto Speedway; March Inland Port; and the Perris Valley Airport and Skydiving Center. Ambient noise levels along N Webster Avenue were estimated using the noise contour information in Table N-9 “Long-Term Roadway Noise Levels” in the City of Perris General Plan. According to Table N-9, ambient noise levels along N Webster Avenue from Markham to Ramona range from 70 dB(A) CNEL 7 feet from the centerline of the roadway to 60 dB(A) CNEL at 74 feet away from the centerline of the roadway. The existing residential homes along N Webster Avenue are all approximately 78 feet east of the centerline of N Webster Avenue. Therefore, the ambient noise levels from the roadway should be approximately 60 dB(A) CNEL.

SENSITIVE RECEPTORS

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are considered to be more sensitive to noise intrusion than are commercial or industrial activities. Ambient noise levels can also affect the perceived desirability or livability of a development.

The project site (shown outlined in red in Figure 2 below) is surrounded by a mix of land uses, including residential homes to the north, residential and commercial properties to the east and west, and undeveloped land to the south. The closest noise-sensitive receptor to the project site is the residential home at 4083 N Webster Avenue. The south edge of the residential home is approximately 28 feet from the north edge of the Project site and approximately 55 feet from the Project center point.

Figure 2: Project Site with Noise Sensitive Receptors

Project Area
Nearest Sensitive Receptor (28 feet)

0 100 200 Feet
(At original document size of 8.5x11)
1:2,400

N

Stantec

Project Location
T4S, R3W, S06
USGS 7.4' Quad: Perris, CA

Prepared by DL on 2023-10-30
TR by SET on 2023-10-30
IR by CT on 2023-10-30

Client/Project
2057197530
Chevron
Perris Hydrogen & CNG Fueling Station Improvements Project
Noise Technical Memo

Figure No.
2

Title
Nearest Sensitive Receptor

Notes
1. Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
2. Data Sources: Stantec 2023.
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

V:\1858\Active\2057197530_Chevron_Perris\03_data\gis_cad\gis\MND_Figure9_NearestSensitiveReceptor_20240515.mxd Revised: 2024-05-15 By: mdeseo

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METHODOLOGY

As stated above, the noise contours in Table N-9 in the City of Perris General Plan were used to provide baseline noise conditions within the project site vicinity. For the purpose of this analysis, potential sensitive receptors were determined by reviewing current aerial photography.

Impacts from future project-related traffic were analyzed based on the anticipated operation of the fueling station.

Noise from the Project's mechanical systems would operate regularly and are therefore required to comply with the requirements listed in Chapter 7.34 "Noise Control" in the City of Perris Code of Ordinances.

The FHWA Roadway Construction Noise Model (RCNM) was used to estimate the impact from short-term construction activities. The RCNM is used as the FHWA's national standard for predicting noise generated from construction activities. The RCNM analysis includes the calculation of noise levels at a defined distance for a variety of construction equipment. The spreadsheet inputs include acoustical use factors and distance to receptors and calculates the expected Lmax values and Leq values at a selected receptor.

USEPA Guidelines

The USEPA has established guidelines (USEPA 1973) for assessing the impact of an increase in noise levels. These guidelines have been used as industry standard for several years to determine the potential impact of noise increases on communities. Most people will tolerate a small increase in background noise (up to about 5 dB(A)) without complaint, especially if the increase is gradual over a period of years (such as from gradually increasing traffic volumes). Increases greater than 5 dB(A) may cause complaints and interference with sleep. Increases above 10 dB(A) (heard as a doubling of judged loudness) are likely to cause complaints and should be considered a serious increase. Table 6 defines each of the traditional impact descriptions, their quantitative range, and the qualitative human response to changes in noise levels.

Table 6: USEPA Impact Guidelines

Increase over Existing or Baseline Sound Levels	Impact Per USEPA Region Guidelines	Qualitative Human Perception of Difference in Sound Levels
0 dB to 5 dB	Minimum Impact	Imperceivable or Slight Difference
6 dB to 10 dB	Significant Impact	Significant Noticeable Difference – Complaints Possible
Over 10 dB	Serious Impact	Loudness Changes by a Factor of Two or Greater. Clearly Audible Difference – Complaints Likely

ENVIRONMENTAL IMPACT ANALYSIS

EXTERIOR TRAFFIC NOISE LEVEL IMPACTS

The proposed station improvements would operate during hours consistent with the operational hours of the existing convenience store and gasoline fueling facilities on-site, which is currently open 24 hours per day. Cars that operate using hydrogen are known as fuel-cell electric vehicles (FCEV). At first, the number of FCEV vehicles using the station is not anticipated to be many but as FCEVs and CNG-powered vehicles become more popular and common, the number of daily trips to the service station could increase. The activity from FCEV vehicle activity at the station is not anticipated to be greater than the current vehicle usage from the existing convenience store and gasoline fueling activities. Therefore, the impact of noise from the added FCEV vehicle activity is expected to be less than significant.

Hydrogen gas and CNG would be delivered to the site, as needed, based on supply and demand. Tanker trucks would deliver fuel to the site. Initially, delivery would occur approximately once per week. Delivery frequency could increase as FCEVs become more common and the demand for hydrogen fuel increases. Maximum delivery frequency, based on maximum possible demand, would be once per day. Adding one tractor trailer truck per day to the current traffic volumes on the local roadways will not increase the noise levels at the surrounding properties. Therefore, the noise impact from gas and CNG delivery to the Project site will be less than significant.

The proposed fueling facilities would not change current operations of the existing convenience store and gasoline fueling station. No additional employees would be added with the additional fueling at the Project site. Therefore, the noise impact from employee traffic will be less than significant.

PROJECT FIXED-SOURCE NOISE IMPACTS

This project will involve the installation of an NEL H2Station with two new CNG dispensers, four new diesel fuel dispensers, and three hydrogen dispensers. The NEL H2 Station is “designed as a completed hydrogen refueling solution used to conduct a safe, fast, and complete refueling of hydrogen (or H2) to hydrogen fuel cell vehicles.” Based on NEL manufacturer’s data, the NEL H2Station placed on site is anticipated to have a sound pressure level of 69.9 dB(A) during daytime hours and 54.2 dB(A) during nighttime hours, both measured at 16.4 feet from the equipment. Accounting for distance attenuation from a point source, the NEL H2Station equipment would have a sound pressure level of 58.9 dB(A) during daytime hours and 43.2 dB(A) during nighttime hours as measured at the closest noise-sensitive receptor 55 feet from the center of the Project site. These levels are well below the maximum noise level limits listed in Section 7.34.040 in the City of Perris Code of Ordinances.

Any other exterior noise-producing fixed-source equipment placed on the Project site at a later date would be designed incorporating measures such as shielding and/or appropriate attenuators to reduce noise levels that may affect nearby properties. In addition, nighttime noise limits would be applicable to any equipment required to operate between the hours of 10:01 P.M. and 7:00 A.M. Therefore, the impact of fixed-source noise to the neighboring properties would be less than significant.

SHORT-TERM CONSTRUCTION NOISE IMPACTS

Construction activities would include site excavation, grading, utilities and piping, concrete, above ground construction, canopy construction, and equipment installation. Each construction stage has its own mix of equipment, and consequently, its own noise characteristics. The various construction operations would change the character of the noise generated at the project site and therefore, the noise level as construction progresses. The loudest stages of construction typically involve earthmoving and grading equipment.

The construction of the Chevron Perris Hydrogen Fueling Station project would be conducted in seven stages and each stage will use different construction equipment. The main types of noise-producing equipment for each construction stage are shown in Table 8.

Table 8: Construction Stage Equipment

Construction Stage	Construction Equipment
Site Excavation	• Excavator • Front-End Loader • Rubber-Tired Dozer
Grading	• Compactor • Excavator • Water Truck
Utilities and Piping	• Backhoe • Off-Road Truck
Concrete	• Flat Bed Truck • Off-Road Truck • Crane
Above Ground Construction	• Off-Road Trucks (2) • Crane • Flat Bed Truck
Canopy Construction	• Off-Road Trucks (2) • Crane • Flat Bed Truck
Equipment Installation	• Off-Road Truck • Flat Bed Truck

Table 9 lists the types of construction equipment and the maximum and average operational noise level as measured at 55 feet from the operating equipment. The 55-foot distance represents the approximate distance between the center of the Project and the closest noise-sensitive residential receptor. Calculating construction noise from the center point of the Project follows the approved assessment procedure defined in the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual.

Table 9: Federal Highway Administration Roadway Construction Noise Model Source Levels

Construction Equipment Source at the Project Site	Distance to Nearest Sensitive Receptor, feet	Sound Level at Receptor		
		Lmax, dB(A)	Acoustical Use Factor (%)	Leq, dB(A)
Backhoe	55	76.7	40	72.8
Compactor	55	82.4	20	75.4
Crane	55	79.7	16	71.8
Dozer	55	80.8	40	76.9
Excavator	55	79.9	40	75.9
Flat Bed Truck	55	73.4	40	69.4
Front End Loader	55	78.3	40	74.3
Off-Road Truck	55	74.2	40	70.2
Water Truck	55	74.2	40	70.2

Notes:
1. Source: Stantec 2023, Federal Highway Administration RCNM v1.1 2008

For the construction noise analysis, it was assumed all noise-generating equipment were operating at the same time and at the same distance from the closest noise-sensitive receptor. Using this assumption, the RCNM program calculated the following combined Leq and Lmax noise levels from each stage of construction as shown in Table 10:

Table 10: Calculated Noise Level from Each Construction Stage

Construction Phase	Distance to Closest Noise Sensitive Receptor, ft	Calculated Lmax, dB(A)	Calculated Leq, dB(A)
Site Excavation	55	84.6	80.6
Grading	55	84.7	79.3
Utilities and Piping	55	78.6	74.7
Concrete	55	81.5	75.3
Above Ground Construction	55	82.2	76.5
Canopy Construction	55	82.2	76.5

Construction Phase	Distance to Closest Noise Sensitive Receptor, ft	Calculated Lmax, dB(A)	Calculated Leq, dB(A)
Equipment Installation	55	76.8	72.8

Section 7.34.060 “Construction Noise” in the City of Perris Code of Ordinances states that construction activity shall not exceed 80 dB(A) [Leq] in residential zones in the city.” The only phase calculated to potentially exceed 80 dB(A) at the closest residential receptor is the site excavation stage. This stage will only last for approximately 10 workdays. All construction activities will also be limited to the time restrictions set by the City of Perris Code of Ordinances. In conclusion, construction noise would be short-term and intermittent. Furthermore, construction noise would comply with the City’s construction hours restrictions; therefore, impacts would be less than significant.

SHORT-TERM CONSTRUCTION VIBRATION IMPACTS

During construction of the proposed Project, equipment such as trucks and bulldozers may be used as close as 30 feet from the nearest residential sensitive receptor. Equipment used during Project construction could generate vibration levels between 0.0023 PPV and 0.0890 PPV at 30 feet, as shown below in Table 11. All estimated vibration levels should be below the FTA vibration threshold at which human annoyance could occur and below the threshold for potential building damage as defined in Table 4. Therefore, impacts from construction vibration would be less than significant.

Table 11: Estimated Vibration Levels for Construction Equipment

Type of Equipment	Peak Particle Velocity at 30 Feet	Threshold at which Human Annoyance Could Occur	Potential for Proposed Project to Exceed Threshold
Large Bulldozer	0.0890	0.10	No
Loaded Trucks	0.0578	0.10	No
Small Bulldozer	0.0023	0.10	No

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

AIRPORT NOISE IMPACTS

The nearest public airport to the Project site is the Perris Valley Airport approximately 5.84 miles southeast of the Project site. The Project site therefore falls well outside of any airport noise contours. Therefore, this would be less than significant impact.

Reference: Noise Technical Memo for Chevron Perris Hydrogen Fueling Station

CONCLUSION

Noise generation associated with the proposed development is typically attributed to the project construction activities. These include excavation and the construction of the canopy and apparatuses. Operational noise generation can be attributed to fixed mechanical equipment.

Based on the FHWA RCNM the proposed project can generate, high levels of construction noise, which are temporary and will not result in long-term impacts from construction. While the noise level impacts presented for each phase of construction may at times be audible over traffic-related noise level impacts surrounding the area, these high levels are not expected to be continuous. Moreover, these noise levels will occur only during the hours allowed by the City's Code of Ordinances. Therefore, the Chevron Perris Hydrogen Fueling Station Project will have a less than significant impact on the surrounding community.

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