

**505-511 South Oak Knoll Avenue
Residential Project
Air Quality and Global Climate Change Analysis**

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c o n s u l t i n g

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I. INTRODUCTION AND SUMMARY

1. PURPOSE OF ANALYSIS AND STUDY OBJECTIVES

The purpose of this air quality and global climate change impact analysis is to provide an assessment of the impacts resulting from development of the 505-511 S. Oak Knoll Avenue Residential Project and to identify measures that may be necessary to reduce potentially significant impacts. This study was performed to address the possibility of regional/local air quality impacts and global climate change impacts, from project-related air emissions. The objectives of the study include:

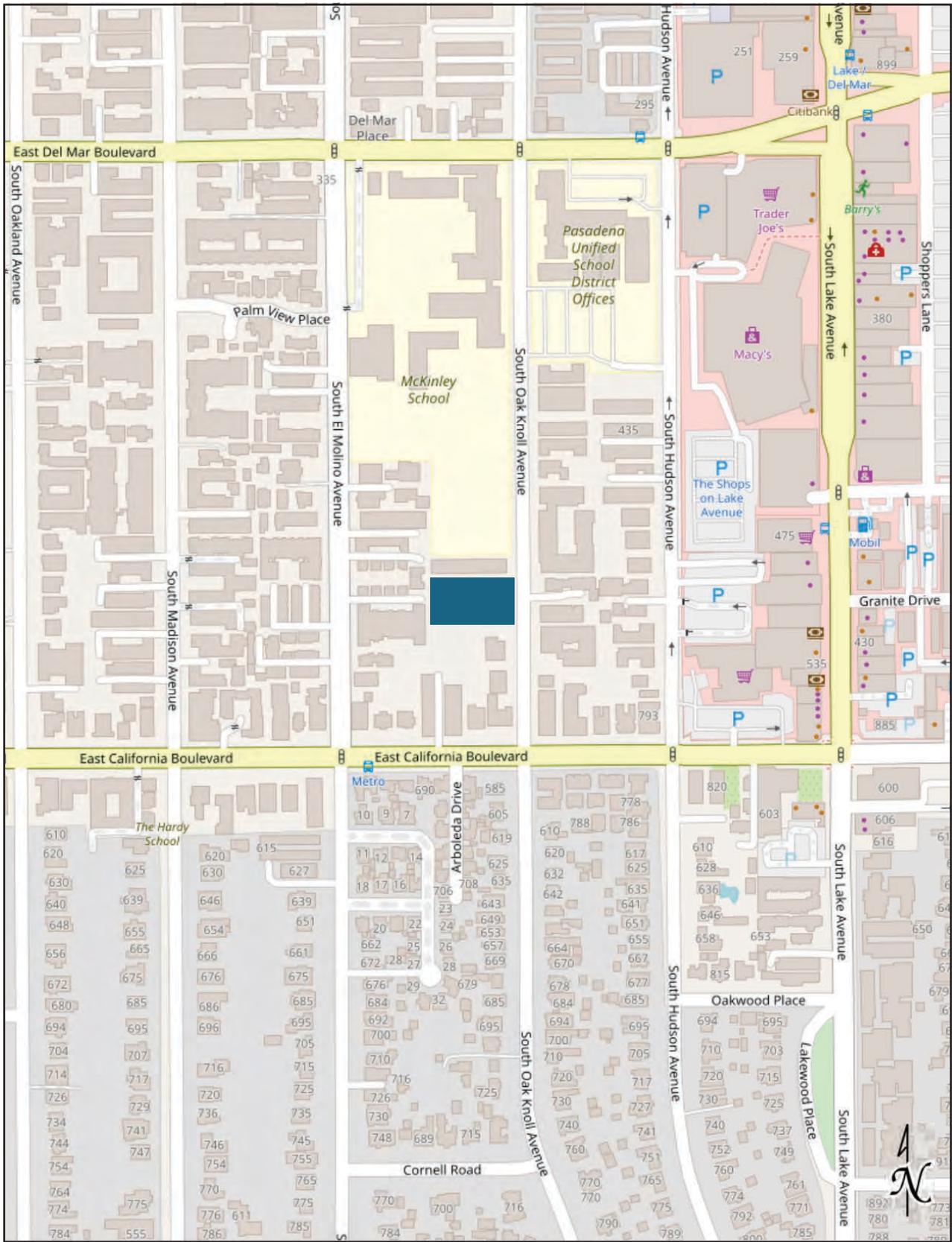
- documentation of the atmospheric setting
- discussion of criteria pollutants
- discussion of the air quality regulatory framework
- discussion of the air quality thresholds of significance
- analysis of the construction related air quality emissions
- analysis of the operations related air quality emissions
- analysis of the conformity of the proposed project with the SCAQMD AQMP
- recommendations for emissions reduction measures

The City of Pasadena is the lead agency for this air quality and greenhouse gas analysis, in accordance with the California Environmental Quality Act authorizing legislation. Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with terms unique to air quality and global climate change, a definition of terms has been provided in Appendix A.

2. PROJECT LOCATION

The project site is located at 505 S. Oak Knoll Avenue and 511 S. Oak Knoll Avenue, in the City of Pasadena, with a combined lot size of 28,350 square feet (SF), which is currently vacant with no standing structures.

The vehicle access to the project site's parking garage would be provided at a full access driveway on Oak Knoll Avenue, and the main pedestrian access will also be located on Oak Knoll Avenue. A vicinity map showing the project location of the Site is provided on **Figure 1, Project Location Map**.



= Project Site

Source: Open Street Maps, April 2025.

Figure 1
Project Location Maps

3. PROJECT DESCRIPTION

The proposed project consists of the construction and operation of a four-story 46,295 SF multi-family residential building with 46 dwelling units and one level, 67-space, subterranean parking garage. The total garden space is 9,072 SF and the Site is 0.65 acres (28,350 SF). **Figure 2, Site Plan**, illustrates the Site. The Project includes the installation of solar panels per Title 24 Building Code requirements.

The project is anticipated to start construction no sooner than October 2025 and take approximately 6 months to complete. The Project is anticipated to be operational in 2026. The Project would include approximately 12,000 cubic yards (CY) of export. Even if construction was to occur any time after the respective dates, the analysis represents “worst-case” since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.¹

4. SENSITIVE RECEPTORS IN PROJECT VICINITY

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24 hours, such as residences, hospitals, or convalescent facilities (South Coast Air Quality Management District 2008). Commercial and industrial facilities are not included in the definition because employees do not typically remain on-site for 24 hours.

The nearest sensitive receptors to the Site are: the multi-family residential use located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue; the single-family residential use located adjacent to the southern boundary of the Site, at 541 S. Oak Knoll Avenue; the multifamily residential land use adjacent to the western boundary of the Site²; the multi-family residential uses located adjacent to the western boundary of the Site, at 518 S. El Molino Avenue; the multi-family residential use located approximately 80 feet northeast of the Site, at 500 S. Oak Knoll Avenue; the multi-family residential uses located approximately 75 feet east of the Site, at 510, 512, and 516 S. Oak Knoll Avenue. Other air quality sensitive land uses are located further from the project site and would experience lower impacts.

¹ As shown in the California Emissions Estimator Model (CalEEMod) User’s Guide Version 2020.4.0, Section 4.3.2 “OFFROAD Equipment” as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

² The property at 541 S. Oak Knoll Avenue, Engine Company #34, constructed ca. 1917, and designed by J.J. Blick and the Cornish Manor (constructed ca. 1923) located at 500 S. El Molino Avenue are designated as landmark properties.

5. SUMMARY OF IMPACTS

A. Construction-Source Emissions

Project construction-source emissions would not exceed applicable regional or local thresholds of significance established by the South Coast Air Quality Management District (SCAQMD).

As discussed herein, the project will comply with all applicable SCAQMD construction-source emission reduction rules and guidelines. Project construction source emissions would not cause or substantively contribute to violation of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS) or result in toxic air contaminant (TAC)-related impacts.

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less than significant.

B. Operational-Source Emissions

The project operational-sourced emissions would not exceed applicable regional or local thresholds of significance established by the SCAQMD. Additionally, project-related trips will not cause or result in CO concentrations exceeding applicable state and/or federal standards (CO “hotspots”). Project operational-source emissions would therefore not adversely affect sensitive receptors within the vicinity of the project.

The project's emissions are below SCAQMD regional thresholds and would not result in a significant cumulative impact. The project does not propose any such uses or activities that would result in potentially significant operational-source toxic air contaminants or odor impacts. Potential operational-source odor impacts are therefore considered less than significant.

C. Greenhouse Gases

The Project's emissions will not exceed the Pasadena Climate Action Plan (CAP)'s GHG efficiency threshold for 2026-2030. Therefore, the project would not conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases and impacts are considered to be less than significant.

II. AIR QUALITY ANALYSIS

1. EXISTING AIR QUALITY CONDITIONS

A. Local Air Quality

The project site is located within the City of Pasadena, within the west San Gabriel Valley portion of Los Angeles County; which is part of the South Coast Air Basin (Basin). The Basin includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. Bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, the Basin is an area of high air pollution potential. The regional climate within the Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. Air quality within the Basin is influenced by a wide range of emissions sources—such as dense population centers, heavy vehicular traffic, and industry. Climate change within the Basin is influenced by a wide range of emission sources, such as utility usage, heavy vehicular traffic, industry, and meteorology.

The annual average temperature varies throughout the Basin, ranging from the low to mid 60s to over 100 degrees during the summer, measured in Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas.

The Basin experiences a persistent temperature inversion, which is characterized by increasing temperature with increasing altitude. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer.

Aside from a persistent temperature inversion, the vertical dispersion of air contaminants in the Basin is also affected by wind conditions. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. Conversely, on days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in the Basin are transported eastward, predominantly into Riverside and San Bernardino Counties. Santa Ana winds, which are strong and dry north or northeasterly winds that occur during the fall and winter months, disperse air contaminants differently through the Basin, generally resulting in worse air conditions in the inner basin areas. Santa Ana conditions tend to last for several days at a time. Wind speeds in Pasadena area average about 6.9 miles per hour (mph).³

³ *Weather Spark, Average Weather in Pasadena, website: <https://weatherspark.com/y/1718/Average-Weather-in-Pasadena-California-United-States-Year-Round>.*

The majority of annual rainfall in the Basin occurs between December and March. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions. The annual average total of rainfall in the Pasadena area is approximately 21 inches.⁴

In the winter, light nocturnal winds result mainly from the drainage of cool air off of the mountains toward the valley floor while the air aloft over the valley remains warm. This forms a type of inversion known as a radiation inversion. Such winds are characterized by stagnation and poor local mixing and trap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution “hot spots” in heavily developed coastal areas of the basin, there is not enough traffic in inland valleys to cause any winter air pollution problems. Despite light wind conditions, especially at night and in the early morning, winter is generally a period of good air quality in the project vicinity.

The temperature and precipitation levels for the Pasadena area (Pasadena, CA Station), the closest monitoring station to the project site, are shown below in **Table 1, Local Monthly Climate Data**. Table 1 shows that August is typically the warmest month and December is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table 1
Local Monthly Climate Data

Descriptor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Max. Temperature	66.5	67.8	69.9	73.4	76.3	81.7	88.4	89.2	87.1	80.6	73.8	67.2
Avg. Min. Temperature	42.6	44.1	45.1	48.8	52.2	55.7	59.9	60.3	58.5	53.4	47.2	43.2
Avg. Total Precipitation (in.)	4.39	4.54	3.39	1.39	0.43	0.13	0.03	0.08	0.36	0.7	1.67	3.14
<i>Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6719 Data from the Pasadena, CA station (046719) for period 1/1/1898 to 6/10/2016</i>												

B. Pollutants

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

⁴ *Best Places, Climate in Pasadena, California, website:*
<https://www.bestplaces.net/climate/city/california/pasadena>.

i) Criteria Pollutants

The criteria pollutants consist of: ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants “criteria” air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants.

ii) Nitrogen Dioxides

Nitrogen Oxides (NO_x) is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NO_x are colorless and odorless, concentrations of nitrogen dioxide (NO₂) can often be seen as a reddish-brown layer over many urban areas. NO_x form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NO_x reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO₂, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the patterns of prevailing winds. Therefore, controlling NO_x is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

iii) Ozone

Ozone (O₃) is not usually emitted directly into the air but at ground-level is created by a chemical reaction between NO_x and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NO_x and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NO_x and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NO_x and VOC emissions.

iv) Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust.

Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion

conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

v) Sulfur Dioxide

Sulfur Oxide (SOx) gases (including sulfur dioxide [SO₂]) are formed when fuel containing sulfur, such as coal and oil is burned, and from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

vi) Lead

Lead (Pb) is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants, and children to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

vii) Particulate Matter

Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Particulate matter is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM₁₀) are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5

micrometers in diameter (PM_{2.5}) have been designated as a subset of PM₁₀ due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

viii) *Reactive Organic Gases (ROG)*

Although not a criteria pollutant, reactive organic gases (ROGs), or volatile organic compounds (VOCs), are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably. Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM₁₀ and lower visibility.

C. Other Pollutants of Concern

i) *Toxic Air Contaminants*

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of toxic air contaminants include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important of these toxic air contaminants, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to toxic air contaminants can result from emissions from normal operations as well as from accidental releases. Health effects of toxic air contaminants include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to the 2013 [California Almanac of Emissions and Air Quality](#) (CARB 2013), the majority of the estimated health risk from toxic air contaminants can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). Diesel particulate matter is a subset of PM_{2.5} because the size of diesel particles are typically 2.5 microns and smaller. The identification of diesel particulate matter as a toxic air contaminant in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in diesel particulate matter by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture

of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or “soot”. Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California’s identification of diesel particulate matter as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to diesel particulate matter is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California’s potential airborne cancer risk from combustion sources.

ii) Asbestos

Asbestos is listed as a TAC by the ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. Naturally occurring asbestos is not present in Los Angeles County. The nearest likely locations of naturally occurring asbestos, as identified in the General Location Guide for Ultramafic Rocks in California prepared by the California Division of Mines and Geology, is located at Asbestos Mountain in the San Jacinto Valley, over 102 miles southeast of the Site. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

2. REGULATORY SETTING

The proposed project is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

A. Federal – United States Environmental Protection Agency

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The NAAQS pollutants were identified using medical evidence and are shown below in **Table 2, State and Federal Criteria Pollutant Standards**.

Table 2
State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O ₃)	0.09 ppm/1-hour 0.07 ppm/8-hour	0.070 ppm/8-hour	(a) Decline in pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm/1-hour 9.0 ppm/8-hour	35.0 ppm/1-hour 9.0 ppm/8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO ₂)	0.18 ppm/1-hour 0.03 ppm/annual	100 ppb/1-hour 0.053 ppm/annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO ₂)	0.25 ppm/1-hour 0.04 ppm/24-hour	75 ppb/1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM ₁₀)	50 µg/m ³ /24-hour 20 µg/m ³ /annual	150 µg/m ³ /24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter (PM _{2.5})	12 µg/m ³ / annual	35 µg/m ³ /24-hour 9 µg/m ³ /annual	
Sulfates	25 µg/m ³ /24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) property damage.
Lead	1.5 µg/m ³ /30-day	0.15 µg/m ³ /3-month rolling	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more due to particles when humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Source: <https://ww2.arb.ca.gov/resources/national-ambient-air-quality-standards> and <https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards>

The EPA and the California Air Resource Board (CARB) designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or ‘form’ of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM2.5 standard is met if the three-year average of the annual average PM2.5 concentration is less than or equal to the standard. Attainment status is shown in **Table 3, South Coast Air Basin Attainment Status**.

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

As indicated below in Table 3, the South Coast Air Basin has been designated by the EPA as a non-attainment area for ozone (O₃), suspended particulates (PM2.5), and lead. Currently, the Basin is in attainment with the ambient air quality standards for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and particulate matter (PM10).

Table 3
South Coast Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)
Carbon monoxide	Attainment	Attainment/Unclassified
Nitrogen dioxide	Attainment	Attainment/Unclassified
Sulfur dioxide	Attainment	Attainment/Unclassified
PM10	Nonattainment	Attainment (Maintenance)
PM2.5	Nonattainment	Nonattainment (Moderate)
Lead (Pb)	Attainment	Nonattainment

Source (Federal and State Status): California Air Resources Board (2023) <https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations> & SCAQMD 2022 Air Quality Management Plan (December 2022) <http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16>.

B. State – California Air Resources Board

The CARB, which is a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CAAQS for criteria pollutants are shown in Table 2. In addition, the

CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g., hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The SCAQMD-portion of the South Coast Air Basin (SCAB) has been designated by the CARB as a nonattainment area for ozone, PM10 and PM2.5. Currently, the SCAB is in attainment with the ambient air quality standards for CO, lead, SO₂, NO₂, and sulfates and is unclassified for visibility reducing particles and Hydrogen Sulfide.

On June 20, 2002, the CARB revised the PM10 annual average standard to 20 µg/m³ and established an annual average standard for PM2.5 of 12 µg/m³. These standards were approved by the Office of Administrative Law in June 2003 and are now effective. On September 27, 2007 CARB approved the South Coast Air Basin and the Coachella Valley 2007 Air Quality Management Plan for Attaining the Federal 8-hour Ozone and PM2.5 Standards. The plan projects attainment for the 8-hour Ozone standard by 2024 and the PM2.5 standard by 2015.

On December 12, 2008 the CARB adopted Resolution 08-43, which limits NO_x, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. On October 12, 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, Title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California.

The CARB is also responsible for regulations pertaining to toxic air contaminants. The Air Toxics “Hot Spots” Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release into the South Coast Air Basin. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

i) AB 617 Nonvehicular Air Pollution: Criteria Air Pollutants and Toxic Air Contaminants

This bill requires the state board to develop a uniform statewide system of annual reporting of emissions of criteria air pollutants and toxic air contaminants for use by certain categories of stationary sources. The bill requires those stationary sources to report their annual emissions of criteria air pollutants and toxic air contaminants, as specified. This bill required the state board, by October 1, 2018, to prepare a monitoring plan regarding technologies for monitoring criteria air pollutants and toxic air contaminants and the need for and benefits of additional community air monitoring systems, as defined. The bill requires the state board to select, based on the monitoring plan, the highest priority locations in the state

for the deployment of community air monitoring systems. The bill requires an air district containing a selected location, by July 1, 2019, to deploy a system in the selected location. The bill would authorize the air district to require a stationary source that emits air pollutants in, or that materially affect, the selected location to deploy a fence-line monitoring system, as defined, or other specified real-time, on-site monitoring. The bill authorizes the state board, by January 1, 2020, and annually thereafter, to select additional locations for the deployment of the systems. The bill would require air districts that have deployed a system to provide to the state board air quality data produced by the system. By increasing the duties of air districts, this bill would impose a state-mandated local program. The bill requires the state board to publish the data on its Internet Web site.

C. Regional

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin. To that end, as a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

i) SCAG

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. Although SCAG is not an air quality management agency, it is responsible for developing transportation, land use, and energy conservation measures that affect air quality. SCAG's 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) identifies growth forecasts that are used in the development of air quality-related land use and transportation control strategies by the South Coast Air Quality Management District.

On April 7, 2016, SCAG's Regional Council adopted the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS or Plan). The Plan is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The Plan charts a course for closely integrating land use and transportation – so that the region can grow smartly and sustainably. It outlines more than \$556.5 billion in transportation system investments through 2040. The Plan was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses, and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. In June 2016, SCAG received its conformity determination from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) indicating that all air quality conformity requirements for the 2016 RTP/SCS and associated 2015 FTIP Consistency Amendment through Amendment 15-12 have been met.

On September 3, 2020, SCAG's Regional Council unanimously voted to approve and fully adopt Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), and the addendum

to the Connect SoCal Program Environmental Impact Report. Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. Connect SoCal outlines more than \$638 billion in transportation system investments through 2045. It was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.

ii) South Coast Air Quality Management District (SCAQMD)

The SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. The SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. It has responded to this requirement by preparing a sequence of AQMPs.

1) AQMP

In May 2022, the SCAQMD completed the 2022 Draft AQMP. The 2022 Draft AQMP is focused on attaining the 2015 8-hour ozone standard (70 ppb) for the South Coast Air Basin and Coachella Valley. The Draft 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emission technologies, when cost-effective and feasible, and low NOx technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other CAA measures to achieve the 2015 8-hour ozone standard. The 2022 AQMP was adopted December 2, 2022, by SCAQMD Governing Board. The 2022 AQMP was approved and adopted by CARB on January 26, 2023. The 2022 AQMP strategy includes the following:⁵

- Wide adoption of zero emissions technologies anywhere available.
- Low NOx technologies where zero emissions aren't feasible.
- Federal Action.
- Zero emissions technologies for residential and industrial sources such as water and space heaters in buildings and homes regionwide.
- Incentive funding in environmental justice areas.
- Prioritize benefits on the most disadvantaged communities.

⁵ SCAQMD 2022 AQMP Infographic. <http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2022-aqmp-infographic>.

2) SCAQMD Rules

During construction and operation, the project must comply with applicable rules and regulations. The following are rules that the project may be required to comply with, either directly, or indirectly:

a) SCAQMD Rule 402

Prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

b) SCAQMD Rule 403

Governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rule 403 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Applicable dust suppression techniques from Rule 403 are summarized below. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM₁₀ component). Compliance with these rules would reduce impacts on nearby sensitive receptors. Rule 403 measures may include but are not limited to the following:

- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
- Water active sites at least three times daily. (Locations where grading is to occur will be thoroughly watered prior to earthmoving.)
- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 0.6 meters (2 feet) of freeboard (vertical space between the top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code section 23114.

c) SCAQMD Rule 445

Prohibits permanently installed wood burning devices into any new development. A wood burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.

d) SCAQMD Rule 481

Applies to all spray painting and spray coating operations and equipment. The rule states that a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

- (1) The spray coating equipment is operated inside a control enclosure, which is approved by the Executive Officer. Any control enclosure for which an application for permit for new construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air pollution control.
- (2) Coatings are applied with high-volume low-pressure, electrostatic, and/or airless spray equipment.
- (3) An alternative method of coating application or control is used which has effectiveness equal to or greater than the equipment specified in the rule.

e) SCAQMD Rule 1108

Governs the sale, use, and manufacturing of asphalt and limits the volatile organic compound (VOC) content in asphalt used in the South Coast Air Basin. This rule would regulate the VOC content of asphalt used during construction. Therefore, all asphalt used during construction of the project must comply with SCAQMD Rule 1108.

f) SCAQMD Rule 1113

Governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of the project must comply with SCAQMD Rule 1113.

g) SCAQMD Rule 1143

Governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

h) SCAQMD Rule 1186

Limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency, or special district such as water, air, sanitation, transit, or school district.

i) SCAQMD Rule 1403

Asbestos Emissions from Demolition/Renovation Activities, specifies work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials (ACM).

3) SCAQMD and CEQA

Although the SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate air quality issues associated with plans and new development projects throughout the South Coast Air Basin. Instead, this is controlled through local jurisdictions in accordance with the California Environmental Quality Act (CEQA). In order to assist local jurisdictions with air quality compliance issues the CEQA Air Quality Handbook (SCAQMD CEQA Handbook) prepared by the SCAQMD (1993) with the most current updates found at <http://www.aqmd.gov/ceqa/hdbk.html>, was developed in accordance with the projections and programs of the AQMP. The purpose of the SCAQMD CEQA Handbook is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties in evaluating a proposed project's potential air quality impacts. Specifically, the SCAQMD CEQA Handbook explains the procedures that the SCAQMD recommends be followed for the environmental review process required by CEQA. The SCAQMD CEQA Handbook provides direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. SCAQMD is in the process of developing an "Air Quality Analysis Guidance Handbook" to replace the CEQA Air Quality Handbook approved by the AQMD Governing Board in 1993. The 1993 CEQA Air Quality Handbook is still available but not online. In addition, there are sections of the 1993 Handbook that are obsolete. In order to assist the CEQA practitioner in conducting an air quality analysis while the new Handbook is being prepared, supplemental information regarding: significance thresholds and analysis, emissions factors, cumulative impacts emissions analysis, and other useful subjects, are available at the SCAQMD website.⁶

D. Local – City of Pasadena

Local jurisdictions, such as the City of Pasadena, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2016 AQMP and SCAQMD Attainment Plans. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

⁶ <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>.

3. MONITORED AIR QUALITY

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2022 Air Quality Management Plan prepared by SCAQMD (December 2022) indicate that collectively, mobile sources account for 46 percent of the VOC, 85 percent of the NO_x emissions, 89 percent of the CO emissions and 29 percent of directly emitted PM_{2.5}, with another 18 percent of PM_{2.5} from road dust.

The EPA and the CARB designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified”. National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or ‘form’ of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM_{2.5} standard is met if the three-year average of the annual average PM_{2.5} concentration is less than or equal to the standard.

The SCAQMD has divided the South Coast Air Basin into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The project site is located in the West San Gabriel Valley Source Receptor Area (SRA 8). The nearest air monitoring station to the project site is the Pasadena – S. Wilson Avenue Monitoring Station (Pasadena Station). The Pasadena Station is located approximately 0.48 miles southeast of the Site, at 752 S. Wilson Avenue, Pasadena. **Table 4, Air Quality Monitoring Summary**, presents the monitored pollutant levels from the Pasadena Station. However, it should be noted that due to the air monitoring station distance from the project site, recorded air pollution levels at the air monitoring station reflect with varying degrees of accuracy, local air quality conditions at the project site. As PM-10 data was not available for the Pasadena station, data was obtained from the Los Angeles- North Main Street Station.

Table 4 summarizes 2021 through 2023 published monitoring data, which is the most recent 3-year period available. The data shows that during the past few years; the project area has exceeded the State ozone and Particulate Matter (PM₁₀) standards.

**Table 4
Air Quality Monitoring Summary**

Pollutant (Standard) ¹		Year		
		2021	2022	2023
Ozone:	Maximum 1-Hour Concentration (ppm)	0.104	0.143	0.109
	Days > CAAQS (0.09 ppm)	12	12	24
	Maximum 8-Hour Concentration (ppm)	0.087	0.102	0.090
	Days > NAAQS/CAAQS (0.070 ppm)	25	22	33
Carbon Monoxide:	Maximum 8-Hour Concentration (ppm)	*	*	*
	Days > CAAQS (9 ppm)	0	0	0
	Days > NAAQS (9 ppm)	0	0	0
Nitrogen Dioxide:	Maximum 1-Hour Concentration (ppm)	0.0773	0.0659	0.0492
	Days > CAAQS (0.18 ppm)	0	0	0
Inhalable Particulates (PM10): ²	Maximum 24-Hour Concentration (µg/m ³)	138.5	61.0	58.0
	Days > NAAQS (150 µg/m ³)	0	0	*
	Days > CAAQS (50 µg/m ³)	14	0	1
	Annual Average (µg/m ³)	30.9	24.1	21.8
Ultra-Fine Particulates (PM2.5):	Maximum 24-Hour Concentration (µg/m ³)	63.6	22.1	52.0
	Days > NAAQS (35 µg/m ³)	2	0	1
	Annual Average (µg/m ³)	10.7	9.1	9.0

Notes:
 Source: <http://www.arb.ca.gov/adam/topfour/topfour1.php>. Data from the Pasadena-S. Wilson Avenue Monitoring Station, unless otherwise noted.
 (1) CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million
 (2) Data obtained from the Los Angeles - North Main Street Station.
 * Means there was insufficient data available to determine value.

A. Ozone

During the 2021 to 2023 monitoring period, the State 1-hour concentration standard for ozone was exceeded between 12 and 24 days at the Pasadena Station. The State/Federal 8-hour ozone standard has been exceeded between 22 and 33 days each year over the past three years at the Pasadena Station. Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO₂, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of the SCAQMD contribute to the ozone levels experienced at the monitoring station, with the more significant areas being those directly upwind.

B. Carbon Monoxide

CO is another important pollutant that is due mainly to motor vehicles. The Pasadena Station did not record an exceedance of the state or federal 8-hour CO standard for the last three years.

C. Nitrogen Dioxide

The Pasadena Station did not record an exceedance of the State or Federal NO₂ standards for the last three years.

D. Particulate Matter

From 2021 to 2023, the State 24-hour concentration standard for PM₁₀ was exceeded between 1 and 14 days at the Los Angeles Station. There was no exceedance of the Federal standards for PM₁₀. Over the past three years, the Federal 24-hour standards for PM_{2.5} were exceeded between 1 and 3 days at the Pasadena Station.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM₁₀ and PM_{2.5}). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM₁₀ and PM_{2.5}. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

4. AIR QUALITY STANDARDS

A. Significance Thresholds

i) Appendix G of the State CEQA Guidelines

Appendix G of the State CEQA Guidelines states that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make a significance determination. Pursuant to Appendix G, the project would result in a significant impact related to air quality if it would:

- Conflict with or obstruct the implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The CEQA Guidelines Section 15064.7 provides the significance criteria established by the applicable air quality management district or air pollution control district, when available, may be relied upon to make determinations of significance. The potential air quality impacts of the Project are, therefore, evaluated according to thresholds developed by SCAQMD in their CEQA Air Quality Handbook, Air Quality Analysis

Guidance Handbook, and subsequent guidance, which are listed below.⁷ Therefore, the project would result in a potentially significant impact to air quality if it would:

AIR-1: Conflict with or obstruct the implementation of the applicable air quality plan;

AIR-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation as a result of:

- Criteria pollutant emissions during construction (direct and indirect) in excess of the SCAQMD's regional significance thresholds,
- Criteria pollutant emissions during operation (direct and indirect) in excess of the SCAQMD's regional significance thresholds.

AIR-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

AIR-4: Expose sensitive receptors to substantial pollutant concentrations that would:

- Exceed SCAQMD's localized significance thresholds,
- Cause or contribute to the formation of CO hotspots.

AIR-5: Create objectionable odors affecting a substantial number of people.

B. Regional Air Quality

Many air quality impacts that derive from dispersed mobile sources, which are the dominate pollution generators in the basin, often occurs hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally very small and difficult to measure. Therefore, the SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Handbook states that any project in the South Coast Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds identified in **Table 5, SCQAMD Air Quality Significance Thresholds**.

⁷ While the SCAQMD CEQA Air Quality Handbook contains significance thresholds for lead, Project construction and operation would not include sources of lead emissions and would not exceed the established thresholds for lead. Unleaded fuel and unleaded paints have virtually eliminated lead emissions from industrial land use projects such as the Project. As a result, lead emissions are not further evaluated herein.

Table 5
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds	
Pollutant	Construction (lbs/day) Operation (lbs/day)
NOx	100 55
VOC	75 55
PM10	150 150
PM2.5	55 55
SOx	150 150
CO	550 550
Lead	3 3
Toxic Air Contaminants, Odor and GHG Thresholds	
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index > 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
GHG	10,000 MT/yr CO ₂ e for industrial projects
Ambient Air Quality Standards	
Pollutant	SCAQMD Standards
NO ₂ -1-hour average Annual arithmetic mean	0.18 ppm (338 $\mu\text{g}/\text{m}^3$) 0.03 ppm (state) and 0.0534 (federal)
PM10 -24-hour average Construction Operations Annual average	10.4 $\mu\text{g}/\text{m}^3$ 2.5 $\mu\text{g}/\text{m}^3$ 1.0 $\mu\text{g}/\text{m}^3$
PM2.5 -24-hour average Construction Operations	10.4 $\mu\text{g}/\text{m}^3$ 2.5 $\mu\text{g}/\text{m}^3$
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) and 0.075 ppm (federal – 99 th percentile) 0.04 ppm (state)
CO 1-hour average 8-hour average	20 ppm (23,000 $\mu\text{g}/\text{m}^3$) 9 ppm (10,000 $\mu\text{g}/\text{m}^3$)
Lead 30-day average Rolling 3-month average Quarterly average	1.5 $\mu\text{g}/\text{m}^3$ 0.15 $\mu\text{g}/\text{m}^3$ 1.5 $\mu\text{g}/\text{m}^3$
<i>Source: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25</i>	

C. Local Air Quality and Localized Significance Thresholds

Project-related construction air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significance Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. The SCAQMD has also provided Final Localized Significant Threshold Methodology (LST Methodology), revised July 2008, which details the methodology to analyze local air

emission impacts. The Localized Significant Threshold Methodology found that the primary emissions of concern are NO₂, CO, PM₁₀, and PM_{2.5}.

The significance thresholds for the local emissions of NO₂ and CO are determined by subtracting the highest background concentration from the last three years of these pollutants from Table 4 above, from the most restrictive ambient air quality standards for these pollutants that are outlined in the Localized Significant Thresholds. Table 5 shows the ambient air quality standards for NO₂, CO, and PM₁₀ and PM_{2.5}.

D. Toxic Air Contaminants (TACs)

i) Construction

Temporary TAC emissions associated with DPM emissions from heavy construction equipment would occur during the construction phase of the Project. According to the Office of Environmental Health Hazard Assessment (OEHHA)⁸ and the SCAQMD *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis* (August 2003),⁹ health effects from TACs are described in terms of individual cancer risk. “Individual Cancer Risk” is the likelihood that a person exposed to concentrations of TACs over a 30-year lifetime will contract cancer based on the use of standard risk-assessment methodology. Additionally, the SCAQMD CEQA guidance does not require a HRA for short-term construction emissions. Construction activities associated with the project would be sporadic, transitory, and short-term in nature (approximately 6 months). Thus, construction of the project would not result in a substantial, long-term (i.e., 30-year) source of TAC emissions. Nonetheless, a qualitative assessment of TAC emissions associated with short-term construction TAC emissions is provided in the analysis section below.

ii) Operation

CARB published the *Air Quality and Land Use Handbook* in April 2005 to serve as a general guide for considering impacts to sensitive receptors from facilities that emit TAC emissions. The recommendations provided therein are voluntary and do not constitute a requirement or mandate for either land use agencies or local air districts. The goal of the guidance document is to protect sensitive receptors, such as children, the elderly, acutely ill, and chronically ill persons, from exposure to TAC emissions. Some examples of CARB’s siting recommendations include the following: (1) avoid siting sensitive receptors within 500 feet of a freeway, urban road with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day; (2) avoid siting sensitive receptors within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units per day,

⁸ *Office of Environmental Health Hazard Assessment, Air Toxic Hot Spots Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessment, February 2015, <https://oehha.ca.gov/media/downloads/crn/2015guidancemanual.pdf>.*

⁹ *South Coast Air Quality Management District, Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis, August 2003, <http://www.aqmd.gov/docs/default-source/ceqa/handbook/mobile-source-toxics-analysis.doc?sfvrsn=2>.*

or where transport refrigeration unit operations exceed 300 hours per week); (3) avoid siting sensitive receptors within 300 feet of any dry cleaning operation using perchloroethylene and within 500 feet of operations with two or more machines; and (4) avoid siting sensitive receptors within 300 feet of a large gasoline dispensing facility (3.6 million gallons per year or more) or 50 feet of a typical gasoline dispensing facility (less than 3.6 million gallons per year). The project will not be located close to any of these types of sources.

E. Odor Impacts

The SCAQMD CEQA Handbook states that an odor impact would occur if the proposed project creates an odor nuisance pursuant to SCAQMD Rule 402, which states:

A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

If the proposed project results in a violation of Rule 402 with regards to odor impacts, then the proposed project would create a significant odor impact.

5. SHORT-TERM CONSTRUCTION EMISSIONS

Construction activities associated with the proposed project would have the potential to generate air emissions, toxic air contaminant emissions, and odor impacts. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant. The construction activities for the proposed project are anticipated to include: minor site preparation (to remove some vegetation and rocks), foundation/excavation of the 0.65-acre site, construction of a four-story 46,295 SF multi-family residential building with 46 dwelling units and one level, 67-space, subterranean parking garage, and application of architectural coatings. The total garden space is 9,072 SF. The project is anticipated to export a total of 12,000 CY of material during the site preparation and foundation/excavation phase. See Appendix A for more details.

The project is anticipated to start construction no sooner than October 2025 and take approximately 6 months to complete. The project is anticipated to be operational in 2026.

A. Methodology

The following provides a discussion of the methodology used to calculate regional construction air emissions and an analysis of the proposed project's short-term construction emissions for the criteria

pollutants. The construction-related regional air quality impacts have been analyzed for both criteria pollutants and GHGs.

Emissions are estimated using the CalEEMod (Version 2022.1.1.29) software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.

Daily regional emissions during construction are forecasted by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source and fugitive dust emissions factors. The input values used in this analysis were adjusted to be project-specific for the construction schedule and the equipment used was based on CalEEMod defaults. The CalEEMod program uses the EMFAC2021 computer program to calculate the emission rates specific for Los Angeles County for construction-related employee vehicle trips and the OFFROAD2017 computer program to calculate emission rates for heavy truck operations. EMFAC2021 and OFFROAD2017 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running hour. Daily truck trips and CalEEMod default trip length data were used to assess roadway emissions from truck exhaust. The maximum daily emissions are estimated values for the worst-case day and do not represent the emissions that would occur for every day of project construction. The maximum daily emissions are compared to the SCAQMD daily regional numeric indicators. Detailed construction equipment lists, construction scheduling, and emission calculations are provided in Appendix A.

The project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, managing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 acres or more of soil or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Based on the size of the Project area (approximately 0.65 acres) a Fugitive Dust Control Plan or Large Operation Notification would not be required.

SCAQMD's Rule 403 minimum requirements require that the application of the best available dust control measures is used for all grading operations and include the application of water or other soil stabilizers in sufficient quantity to prevent the generation of visible dust plumes. Compliance with Rule 403 would

require the use of water trucks during all phases where earth moving operations would occur. Compliance with Rule 403 has been included in the CalEEMod modeling for the proposed project.

Per SCAQMD Rule 1113 as amended on June 3, 2011, the architectural coatings that would be applied to buildings after January 1, 2014 will be limited to an average of 50 grams per liter or less. CalEEMod defaults have been adjusted accordingly.

The phases of the construction activities which have been analyzed below for each phase are: (1) site preparation, (2) foundation/excavation, (3) building construction, and (4) application of architectural coatings. Details pertaining to the project's construction timing and the type of equipment modeled for each construction phase are available in the CalEEMod output in Appendix A of this technical report.

B. Construction-Related Regional Impacts

The construction-related criteria maximum daily pollutant emissions for each phase are shown below in **Table 6 Construction-Related Regional Pollutant Emissions**. Table 6 shows the worst-case of either summer or winter criteria pollutant emissions and that none of the project's emissions would exceed regional thresholds. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project.

**Table 6
Construction-Related Regional Pollutant Emissions**

Activity	Maximum Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO ₂	PM10	PM2.5
Maximum Daily Emissions ^{1,2}	28.83	15.25	14.05	0.07	3.05	0.97
SCAQMD Thresholds	75	100	550	150	150	55
Exceeds Thresholds?	No	No	No	No	No	No
<i>Notes:</i>						
<i>(1) Includes emissions from both on-site and off-site emissions. Site preparation and excavation PM-10 and PM-2.5 emissions show compliance with SCAQMD Rule 403.</i>						
<i>(2) Construction and painting phases may overlap.</i>						
<i>Source: CalEEMod Version 2022.1.1.29.</i>						

C. Construction-Related Local Impacts

Construction-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. The proposed project has been analyzed for the potential local air quality impacts created from: construction-related fugitive dust and diesel emissions; from toxic air contaminants; and from construction-related odor impacts. The local air quality emissions from construction were analyzed using the SCAQMD’s Mass Rate Localized Significant Threshold Look-up Tables and the methodology described in Localized Significance Threshold Methodology prepared by SCAQMD (revised July 2008). The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. The emission thresholds were calculated based on the West

San Gabriel Valley source receptor area (SRA) 8 and a disturbance value of one acre per day (the site is 0.65 acres). According to LST Methodology, any receptor located closer than 25 meters (82 feet) shall be based on the 25-meter thresholds.

The nearest sensitive receptors to the Site are: the multi-family residential use located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue; the single-family residential use located adjacent to the southern boundary of the Site, at 541 S. Oak Knoll Avenue; the multi-family residential uses located adjacent to the western boundary of the Site, at 518 S. El Molino Avenue; the multi-family residential use located approximately 80 feet northeast of the Site, at 500 S. Oak Knoll Avenue; the multi-family residential uses located approximately 75 feet east of the Site, at 510, 512, and 516 S. Oak Knoll Avenue; therefore, the SCAQMD 25-meter Look-up Tables was used. **Table 7, Local Construction Emissions at the Nearest Receptors**, shows the on-site emissions from the CalEEMod model for the different construction phases and the LST screening criteria. As stated previously, other air quality sensitive land uses are located further from the project site and would experience lower impacts.

The data provided in Table 7 shows that none of the analyzed criteria pollutants would exceed the LST screening criteria at the nearest sensitive receptors. Therefore, a less than significant local air quality impact would occur from construction of the proposed project.

**Table 7
Local Construction Emissions at the Nearest Receptors**

Activity	On-Site Pollutant Emissions (pounds/day)			
	NOx	CO	PM10	PM2.5
Site Preparation	1.93	2.92	0.07	0.06
Excavation/Foundation	4.57	5.45	0.15	0.15
Building Construction	8.05	9.86	0.32	0.29
Architectural Coating	0.86	1.13	0.02	0.02
SCAQMD LST Screening Criteria¹	69	535	4	3
Exceeds Screening Criteria?	No	No	No	No

Notes:

(1) The nearest sensitive receptors to the site are: the multi-family residential use located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue; the single-family residential use located adjacent to the southern boundary of the Site, at 541 S. Oak Knoll Avenue; the multi-family residential uses located adjacent to the western boundary of the Site, at 518 S. El Molino Avenue; the multi-family residential use located approximately 80 feet northeast of the Site, at 500 S. Oak Knoll Avenue; the multi-family residential uses located approximately 75 feet east of the Site, at 510, 512, and 516 S. Oak Knoll Avenue; therefore, the 25-meter threshold was used.

Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for 1 acre, at a distance of 25 m in SRA 8 West San Gabriel Valley.

D. Construction-Related Toxic Contaminant Impacts

The greatest potential for toxic air contaminant emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed project. According to the Office of Environmental Health Hazard Assessment (OEHHA) and the SCAQMD Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (August 2003), health effects from TACs are described in terms of individual cancer risk based on

a lifetime (i.e., 30-year) resident exposure duration. Given the temporary and short-term construction schedule (approximately 6 months), the Project would not result in a long-term (i.e., lifetime or 30-year) exposure as a result of project construction. Furthermore, construction-based particulate matter (PM) emissions (including diesel exhaust emissions) do not exceed any local or regional thresholds.

The project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. Therefore, impacts from TACs during construction would be less than significant.

E. Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of materials such as asphalt pavement. The objectionable odors that may be produced during the construction process are short-term in nature and the odor emissions are expected to cease upon the drying or hardening of the odor producing materials. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant impact related to odors would occur during construction of the proposed project. Diesel exhaust and VOCs would be emitted during construction of the project, which are objectionable to some; however, emissions would disperse rapidly from the project site and therefore should not reach an objectionable level at the nearest sensitive receptors.

6. LONG-TERM OPERATIONAL EMISSIONS

The on-going operation of the proposed project would result in a long-term increase in air emissions. This increase would be due to emissions from the project-generated vehicle trips and through other operational emissions from the on-going use of the proposed project. The following section provides an analysis of potential long-term air quality impacts due to regional air quality impacts with the on-going operations of the proposed project.

A. Operations-Related Regional Air Quality Impacts

The operations-related criteria air quality impacts created by the proposed project have been analyzed through the use of the CalEEMod model. The operating emissions were based on the year 2026, which is the anticipated opening year for the proposed project. The operations daily emissions printouts from the CalEEMod model are provided in Appendix A. The CalEEMod analyzes operational emissions from area sources, energy usage, and mobile sources, which are discussed below.

i) Mobile Sources

Mobile sources include emissions from the additional vehicle miles generated from the proposed project. Per the *505 S. Oak Knoll Avenue Residential Local Mobility Analysis* (Iteris, March 2025), the Project will generate 4.54 daily trips/DU. The Saturday and Sunday trip generation rates were obtained from the 11th Edition ITE Trip Generation Manual and are 4.57 daily trips/DU and 3.77 daily trips/DU respectively. The

highest mobile source emissions for weekdays and weekends were reported in **Table 8, Regional Operational Pollutant Emissions**. The CalEEMod program then applies the emission factors for each trip, which is provided by the EMFAC2021 model, to determine the vehicular traffic pollutant emissions.

ii) Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps. As specifics were not known about the landscaping equipment fleet, CalEEMod defaults were used to estimate emissions from landscaping equipment. It was assumed that fireplaces/heating would be electric to meet current building code requirements. No other changes were made to the default area source parameters.

iii) Energy Usage

Energy usage includes emissions from the generation of electricity and natural gas used on-site. It is anticipated that the Project will install solar panels on the apartment building that would generate enough energy to offset the apartment's electrical needs, per Building Code requirements. No changes were made to the default energy usage parameters.

**Table 8
Regional Operational Pollutant Emissions**

Activity	Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO2	PM10	PM2.5
Maximum Daily Emissions	2.20	0.69	9.76	0.02	1.32	0.35
SCAQMD Thresholds	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No
<i>Notes:</i> Source: CalEEMod Version 2022.1.1.29. the higher of summer or winter emissions (see Appendix A for details).						

iv) Project Impacts

The worst-case summer or winter maximum daily criteria pollutant emissions created from the proposed project's long-term operations have been calculated and are shown in Table 8 above. Table 8 shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Therefore, a less than significant regional air quality impact would occur from the operation of the proposed project.

B. Operations-Related Local Air Quality Impacts

Project-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. The proposed project has been analyzed for the potential local CO emission impacts from the project-generated vehicular trips and from the potential local air

quality impacts from on-site operations. The following analysis analyzes the vehicular CO emissions, local impacts from on-site operations per SCAQMD LST methodology, and odor impacts.

i) Local CO Emission Impacts from Project-Related Vehicular Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with project CO levels to the State and Federal CO standards which were presented above.

To determine if the proposed project could cause emission levels in excess of the CO standards discussed above, a sensitivity analysis is typically conducted to determine the potential for CO “hot spots” at a number of intersections in the general project vicinity. Because of reduced speeds and vehicle queuing, “hot spots” potentially can occur at high traffic volume intersections with a Level of Service E or worse.

The analysis prepared for CO attainment in the South Coast Air Basin by the SCAQMD can be used to assist in evaluating the potential for CO exceedances in the South Coast Air Basin. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 Air Quality Management Plan (2003 AQMP) and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan). As discussed in the 1992 CO Plan, peak carbon monoxide concentrations in the South Coast Air Basin are due to unusual meteorological and topographical conditions, and not due to the impact of particular intersections. Considering the region's unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of 1992 CO Plan and subsequent plan updates and air quality management plans. In the 1992 CO Plan, a CO hot spot analysis was conducted for four busy intersections in Los Angeles at the peak morning and afternoon time periods. The intersections evaluated included: South Long Beach Boulevard and Imperial Highway (Lynwood); Wilshire Boulevard and Veteran Avenue (Westwood); Sunset Boulevard and Highland Avenue (Hollywood); and La Cienega Boulevard and Century Boulevard (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which has a daily traffic volume of approximately 100,000 vehicles per day. The Los Angeles County Metropolitan Transportation Authority evaluated the Level of Service in the vicinity of the Wilshire Boulevard/Veteran Avenue intersection and found it to be Level of Service E during the morning peak hour and Level of Service F during the afternoon peak hour.

The 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan) showed that an intersection which has a daily traffic volume of approximately 100,000 vehicles per day would not violate the CO standard. The project generates 209 daily vehicle trips, with 18 peak hour trips, and the traffic study showed that the study intersections would experience marginal or no increases in delays with the proposed project. All intersections would continue to operate at LOS D or better during both a.m. and p.m. peak hours under the existing with project conditions. Therefore, as the intersection volumes fall far short of 100,000 vehicles per day, no CO “hot spot” modeling was performed, and no significant long-term air quality impact is anticipated to local air quality with the on-going use of the proposed Project.

i) Local Air Quality Impacts from On-Site Operations

Project-related air emissions from on-site sources such as architectural coatings, landscaping equipment, on-site usage of natural gas appliances as well as the operation of vehicles on-site may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin.

The nearest sensitive receptors to the Site are: the multi-family residential use located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue; the single-family residential use located adjacent to the southern boundary of the Site, at 541 S. Oak Knoll Avenue; the multifamily residential land use adjacent to the western boundary of the Site¹⁰, at 518 S. El Molino Avenue; the multi-family residential use located approximately 80 feet northeast of the Site, at 500 S. Oak Knoll Avenue; the multi-family residential uses located approximately 75 feet east of the Site, at 510, 512, and 516 S. Oak Knoll Avenue.

According to SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources (such as heavy-duty trucks) that may spend long periods queuing and idling at the site; such as industrial warehouse/transfer facilities. The proposed project consists of residential uses, and does not include such industrial uses. Therefore, due the lack of stationary source emissions, no long-term localized significance threshold analysis is warranted.

C. Operations-Related Odor Impacts

Potential sources that may emit odors during the on-going operations of the proposed project would include odor emissions from the intermittent trash truck emissions and trash storage areas. Due to the distance of the nearest receptors from the project site and through compliance with SCAQMD's Rule 402 no significant impact related to odors would occur during the on-going operations of the proposed project.

7. CUMULATIVE AIR QUALITY IMPACTS

There are a number of cumulative projects in the project area that have not yet been built or are currently under construction. Since the timing or sequencing of the cumulative projects is unknown, any quantitative analysis to ascertain daily construction emissions that assumes multiple, concurrent construction projects would be speculative. Further, cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered would cover an even larger area. The SCAQMD recommends using two different methodologies: (1) that project-specific air quality impacts be used to determine the potential cumulative

¹⁰ The property at 541 S. Oak Knoll Avenue, Engine Company #34, constructed ca. 1917, and designed by J.J. Blick and the Cornish Manor (constructed ca. 1923) located at 500 S. El Molino Avenue are designated as landmark properties.

impacts to regional air quality;¹¹ and (2) that a project's consistency with the current AQMP be used to determine its potential cumulative impacts.

A. Project Specific Impacts

A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant. As stated previously, the Air Basin is currently in non-attainment for ozone, PM10, and PM2.5. In accordance with the SCAQMD methodology, projects that do not exceed the SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.

The project would result in the emission of criteria pollutants for which the region is in nonattainment during both construction and operation. The emissions from construction of the project are not predicted to exceed any applicable SCAQMD regional or local impact threshold and therefore, are not expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Therefore, the project would not result in a cumulatively considerable net increase of non-attainment pollutants or ozone precursors and would result in a less than significant impact for construction emissions.

Project operations would generate emissions of NO_x, ROG, CO, PM10, and PM2.5, which would not exceed the SCAQMD regional or local thresholds and would not be expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Since the project would not introduce any substantial stationary sources of emissions, CO is the benchmark pollutant for assessing local area air quality impacts from post-construction motor vehicle operations. As indicated earlier, no violations of the state and federal CO standards are projected to occur for the project, based on the magnitude of traffic the project is anticipated to create. Therefore, operation of the project would not result in a cumulatively considerable net increase for non-attainment of criteria pollutants or ozone precursors. As a result, the project would result in a less than significant cumulative impact for operational emissions.

B. Air Quality Compliance

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan related to air quality that applies to the proposed project is the SCAQMD Air Quality Management Plan (AQMP). Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards.

¹¹ *South Coast Air Quality Management District, Potential Control Strategies to Address Cumulative Impacts from Air Pollution White Paper, 1993, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>.*

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP". Strict consistency with all aspects of the plan is not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

- (1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
- (2) Whether the project will exceed the assumptions in the AQMP in 2022 or increments based on the year of project buildout and phase.

Both of these criteria are evaluated below.

i) Air Quality Compliance Analysis

a) Criteria 1 – Increase in the Frequency or Severity of Violations

Based on the air quality modeling analysis contained in this Air Quality Analysis, short-term construction impacts will not result in significant impacts based on the SCAQMD regional and local thresholds of significance. This Air Analysis also found that long-term operations impacts will not result in significant impacts based on the SCAQMD local and regional thresholds of significance.

Therefore, the proposed project is not projected to contribute to the exceedance of any air pollutant concentration standards and is found to be consistent with the AQMP for the first criterion.

b) Criteria 2 – Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The 2020-2045 Regional Transportation/Sustainable Communities Strategy prepared by SCAG (2020) includes chapters on: the challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA.

For this project, the City of Pasadena General Plan defines the assumptions that are represented in the AQMP.

The project is a four-story multi-family building with a fully subterranean garage. It will be built on a vacant lot. The site is situated in a multi-family high density residential zone. The site is zoned RM-48 HL-40(45)

and is located in the Central District Specific Plan. It is subject to the City of Garden standards. The base maximum density allows for 31 dwelling units. The project provides affordable units, and the applicant intends to utilize a density bonus and a concession, as afforded by the State's Density Bonus Law (SDBL, Government Code Section 65915), to increase the allowable building height from 40 feet to 49 feet, nine inches. The Project is proposing a total of 46 units, adding 32 units through density bonus provisions.

Therefore, the proposed project is consistent with the existing zoning/land use, would not exceed the AQMP assumptions for the project site, and is found to be consistent with the AQMP for the second criterion. Based on the above, the proposed project will not result in an inconsistency with the SCAQMD AQMP. Therefore, a less than significant impact will occur.

III. GLOBAL CLIMATE CHANGE ANALYSIS

1. EXISTING GREENHOUSE GAS ENVIRONMENT

Constituent gases of the Earth’s atmosphere, called atmospheric greenhouse gases (GHG), play a critical role in the Earth’s radiation amount by trapping infrared radiation emitted from the Earth’s surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO₂), methane (CH₄), ozone, water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth’s natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State’s greenhouse gas emissions, followed by electricity generation. Emissions of CO₂ and nitrous oxide (NOx) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO₂, where CO₂ is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean.

2. GREENHOUSE GAS STANDARDS AND REGULATION

A. Local – City of Pasadena

The City of Pasadena adopted the Pasadena Climate Action Plan (CAP) on March 5, 2018. The purpose of the CAP is to analyze GHG emissions at a programmatic-level, outline a strategy to reduce and mitigate municipal and community-wide GHG emissions, demonstrate Pasadena’s commitment to achieving the state-wide emissions reduction targets, and serve as a qualified GHG reduction plan consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5. The timeframe for the CAP extends from the date of adoption through the year 2035, consistent with the horizon year of Pasadena’s 2015 General Plan Land Use Element. The CAP includes the following components:

- Summary of existing state and local initiatives addressing climate change;
- Community-wide GHG inventory and emissions forecasts;
- GHG reduction goals, measures, and actions;
- Implementation and monitoring of the plan; and
- Adaptation strategies and climate change preparedness.

The Climate Action Plan Consistency Checklist (Checklist) is intended to be a tool for new development projects to demonstrate consistency with Pasadena’s CAP. CEQA Guidelines Section 15183.5 allows lead

agencies to analyze the impacts associated with GHG emissions at a programmatic level in plan-level documents such as CAPs, so that project-level environmental documents may tier from the programmatic review. Projects that meet the requirements of this Checklist will be deemed to be consistent with Pasadena's CAP and will be found to have a less than significant contribution to cumulative GHG (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b).

Projects subject to CEQA review have three options to demonstrate consistency with the CAP: Option A, incorporate mandatory and selective sustainable development actions that will become conditions of the entitlement; Option B, quantify the project's GHG emission levels and demonstrate that the project is below Pasadena's service person efficiency threshold; and Option C, quantify the project's GHG emission levels and demonstrate that the project would not result in a net increase in GHG emissions.

3. METHODOLOGY

CalEEMod Version 2022.1.1.29 was used to calculate the GHG emissions from the proposed project. This analysis quantifies the project's total annual GHG emissions.

The proposed project is anticipated to generate GHG emissions from area sources, energy usage, mobile sources, waste, water, and construction equipment. The following provides the methodology used to calculate the project related GHG emissions and the project impacts.

The CalEEMod Output for year 2026 is available in Appendix A. Each source of GHG emissions is described in greater detail below.

A. Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. No changes were made to the default area source emissions.

B. Energy Usage

Energy usage includes emissions from the generation of electricity and natural gas used on-site. It was assumed that heating would be all-electric and that the Project would install solar panels that would offset the energy required for the apartment building, per Building Code requirements. No other changes were made to the default energy usage parameters.

C. Mobile Sources

Mobile sources include emissions from the additional vehicle miles generated from the proposed project. The CalEEMod default trip generation rates were used. See Section II for details.

D. Waste

Waste includes the GHG emissions generated from the processing of waste from the proposed project as well as the GHG emissions from the waste once it is interred into a landfill. AB 341 requires that 75 percent of waste be diverted from landfills by 2020. The Pasadena CAP WR-1 showed that the City has already achieved a 73 percent recycling rate. However, to be conservative, no changes were made to the default waste parameters.

E. Water

Water includes the water used for the interior of the building as well as for landscaping and is based on the GHG emissions associated with the energy used to transport and filter the water. CALGreen requires a 20 percent reduction in indoor water use and water efficient irrigation systems. However, to be conservative, no changes were made to the default water usage parameters.

F. Construction

The construction-related GHG emissions were also included in the analysis and were based on a 30-year amortization rate as recommended in the SCAQMD GHG Working Group meeting on November 19, 2009. The construction related GHG emissions were calculated by CalEEMod using the methodology detailed above in *Section II, Air Quality Analysis*, of this technical report.

4. PROJECT GREENHOUSE GAS EMISSIONS

The GHG emissions have been calculated based on the parameters described above. A summary of the results is shown below in **Table 9, Project-Related Greenhouse Gas Emissions**. Table 9 shows that the project's total emissions would be 284.34 MTCO₂e per year.

Table 9
Project-Related Greenhouse Gas Emissions

Category	Greenhouse Gas Emissions (Metric Tons/Year)					
	Bio-CO ₂	NonBio-CO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Maximum Annual Operations	3.58	261.17	264.75	0.38	0.01	277.98
Construction ¹	-	6.24	6.24	0.00	0.00	6.36
Total Emissions						284.34

Notes:
(1) Construction GHG emissions CO₂e based on a 30-year amortization rate.
Source: CalEEMod Version 2022.1.1.29 for Opening Year 2026.

5. CONSISTENCY WITH APPLICABLE GREENHOUSE GAS REDUCTION PLANS AND POLICIES

As stated above, the Climate Action Plan Consistency Checklist is intended to be a tool for new development projects to demonstrate consistency with Pasadena’s CAP, which is a qualified greenhouse gas (GHG) emissions reduction plan in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5.

The Checklist is only required for discretionary projects¹² that are subject to and not exempt from CEQA. Projects that are exempt from CEQA are deemed to be consistent with Pasadena’s CAP, and no further review is necessary, except for the Class 32 “In-Fill Development Projects” categorical exemption (CEQA Guidelines Section 15332), for which Projects are required to demonstrate consistency with the CAP through this Checklist.

Per the CAP Checklist, the Project can demonstrate consistency with Pasadena’s CAP through one of three options:

- Option A: Sustainable Development Actions – Demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City’s cumulative GHG reduction goals
- Option B: GHG Efficiency - Demonstrate that the proposed project is consistent with Pasadena’s per person GHG efficiency thresholds
- Option C: Net Zero GHG Emissions – Demonstrate that the proposed project would not result in a net increase in GHG emissions

The Project has a service population of 136 residents¹³ and an operational year beginning 2026. Using the total Project GHG emissions of 284.34 MTCO₂e/year reported above in Table 9 and the service population (SP) of 136, the Project would generate emissions of 2.09 MTCO₂e/SP/year. The CAP GHG efficiency threshold for operational year 2026-2030 is 3.57 MTCO₂e/SP/year. Therefore, as the Project’s emissions do not exceed the CAP’s GHG efficiency threshold for 2026-2030, the Project is consistent with the CAP.

¹² *City of Pasadena, Pasadena Climate Action Plan (CAP), March 5, 2018, page 90.*

¹³ *Per population data from the CalEEMod Output (see Appendix A for details).*

IV. EMISSIONS REDUCTION MEASURES

1. CONSTRUCTION MEASURES

Adherence to SCAQMD Rule 403 is required.

2. OPERATIONAL MEASURES

No measures required.

V. LIST OF ACRONYMS AND ABBREVIATIONS

AQMP	Air Quality Management Plan
BACT	Best Available Control Technologies
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH ₄	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DPM	Diesel particulate matter
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
GWP	Global warming potential
HIDPM	Hazard Index Diesel Particulate Matter
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LST	Localized Significant Thresholds
MTCO ₂ e	Metric tons of carbon dioxide equivalent
MMTCO ₂ e	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO _x	Nitrogen Oxides
NO ₂	Nitrogen dioxide
N ₂ O	Nitrous oxide
O ₃	Ozone
OPR	Governor's Office of Planning and Research
PFCs	Perfluorocarbons
PM	Particulate matter
PM ₁₀	Particles that are less than 10 micrometers in diameter
PM _{2.5}	Particles that are less than 2.5 micrometers in diameter

PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SF ₆	Sulfur hexafluoride
SIP	State Implementation Plan
SO _x	Sulfur Oxides
TAC	Toxic air contaminants
VOC	Volatile organic compounds

VI. REFERENCES

California Air Resources Board (CARB)

- 2008 Resolution 08-43
- 2008 Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act
- 2008 Climate Change Scoping Plan, a framework for change.
- 2011 Supplement to the AB 32 Scoping Plan Functional Equivalent Document
- 2013 California Almanac of Emissions and Air Quality – 2013 Edition.
Source: <https://ww2.arb.ca.gov/our-work/programs/resource-center/technical-assistance/air-quality-and-emissions-data/almanac>
- 2014 First Update to the Climate Change Scoping Plan, Building on the Framework Pursuant to AB32, the California Global Warming Solutions Act of 2006. May.
- 2017 California's 2017 Climate Change Scoping Plan. November.
- 2022 2022 Scoping Plan for Achieving Carbon Neutrality. November 16.
- 2025 Historical Air Quality, Top 4 Summary

City of Pasadena

- 2015 General Plan Draft EIR. January
- 2018 Pasadena Climate Action Plan. March 5.

Governor's Office of Planning and Research

- 2008 CEQA and Climate: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review
- 2018 CEQA Guideline Sections to be Added or Amended

Intergovernmental Panel on Climate Change (IPCC).

- 2014 IPCC Fifth Assessment Report, Climate Change 2014: Synthesis Report

Iteris Inc.

- 2025 505 S. Oak Knoll Avenue Residential Local Mobility Analysis Final Report. March 28.

South Coast Air Quality Management District (SCAQMD)

- 1993 CEQA Air Quality Handbook
- 2005 Rule 403 Fugitive Dust
- 2007 2007 Air Quality Management Plan

2008 Final Localized Significance Threshold Methodology, Revised

2016 2016 Air Quality Management Plan

2022 2022 Air Quality Management Plan

Southern California Association of Governments

2020 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy

U.S. Environmental Protection Agency (EPA)

2017 Understanding Global Warming Potentials

(Source: <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>)

U.S. Geological Survey

2011 Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California

APPENDIX A: CALEEMOD EMISSIONS OUTPUT PRINTOUT

505-511 S. Oak Knoll Ave Residential Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	505-511 S. Oak Knoll Ave Residential
Construction Start Date	10/1/2025
Operational Year	2026
Lead Agency	City of Pasadena
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50
Precipitation (days)	23.4
Location	505 S Oak Knoll Ave, Pasadena, CA 91106, USA
County	Los Angeles-South Coast
City	Pasadena
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4966
EDFZ	7
Electric Utility	Pasadena Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Apartments Mid Rise	46.0	Dwelling Unit	0.00	46,295	9,072	—	136	—

Enclosed Parking with Elevator	67.0	Space	0.65	26,800	0.00	—	—	—
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1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	28.6	18.1	12.3	0.06	0.46	4.00	4.46	0.43	1.55	1.98	—	8,953	8,953	0.47	1.18	0.46	9,317
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.98	1.60	1.87	< 0.005	0.05	0.24	0.29	0.05	0.08	0.13	—	647	647	0.03	0.05	0.46	665
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.18	0.29	0.34	< 0.005	0.01	0.04	0.05	0.01	0.01	0.02	—	107	107	0.01	0.01	0.08	110

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.05	18.1	12.3	0.06	0.46	4.00	4.46	0.43	1.55	1.98	—	8,953	8,953	0.47	1.18	0.46	9,317
2026	28.6	7.47	12.0	0.02	0.27	0.78	1.04	0.24	0.19	0.43	—	2,577	2,577	0.11	0.08	0.08	2,603
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.15	1.60	1.87	< 0.005	0.05	0.24	0.29	0.05	0.08	0.13	—	647	647	0.03	0.05	0.46	665
2026	0.98	1.12	1.80	< 0.005	0.04	0.11	0.15	0.04	0.03	0.06	—	396	396	0.02	0.01	0.21	401
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.03	0.29	0.34	< 0.005	0.01	0.04	0.05	0.01	0.01	0.02	—	107	107	0.01	0.01	0.08	110
2026	0.18	0.21	0.33	< 0.005	0.01	0.02	0.03	0.01	< 0.005	0.01	—	65.6	65.6	< 0.005	< 0.005	0.03	66.3

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.05	18.1	12.3	0.06	0.46	4.00	4.46	0.43	1.55	1.98	—	8,953	8,953	0.47	1.18	0.46	9,317
2026	28.6	7.47	12.0	0.02	0.27	0.78	1.04	0.24	0.19	0.43	—	2,577	2,577	0.11	0.08	0.08	2,603
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.15	1.60	1.87	< 0.005	0.05	0.24	0.29	0.05	0.08	0.13	—	647	647	0.03	0.05	0.46	665
2026	0.98	1.12	1.80	< 0.005	0.04	0.11	0.15	0.04	0.03	0.06	—	396	396	0.02	0.01	0.21	401
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.03	0.29	0.34	< 0.005	0.01	0.04	0.05	0.01	0.01	0.02	—	107	107	0.01	0.01	0.08	110
2026	0.18	0.21	0.33	< 0.005	0.01	0.02	0.03	0.01	< 0.005	0.01	—	65.6	65.6	< 0.005	< 0.005	0.03	66.3

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.20	0.68	9.76	0.02	0.02	1.29	1.32	0.02	0.33	0.35	21.6	1,698	1,720	2.29	0.07	5.17	1,803
Mit.	2.20	0.68	9.76	0.02	0.02	1.29	1.32	0.02	0.33	0.35	21.6	1,666	1,688	2.28	0.07	5.17	1,770
% Reduced	—	—	—	—	—	—	—	—	—	—	—	2%	2%	1%	3%	—	2%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.76	0.69	5.52	0.01	0.02	1.29	1.31	0.02	0.33	0.35	21.6	1,626	1,648	2.29	0.07	0.46	1,727
Mit.	1.76	0.69	5.52	0.01	0.02	1.29	1.31	0.02	0.33	0.35	21.6	1,595	1,616	2.28	0.07	0.46	1,695
% Reduced	—	—	—	—	—	—	—	—	—	—	—	2%	2%	1%	3%	—	2%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.03	0.70	8.08	0.01	0.02	1.24	1.26	0.02	0.31	0.33	21.6	1,577	1,599	2.28	0.07	2.36	1,679
Mit.	2.03	0.70	8.08	0.01	0.02	1.24	1.26	0.02	0.31	0.33	21.6	1,546	1,567	2.26	0.07	2.36	1,646
% Reduced	—	—	—	—	—	—	—	—	—	—	—	2%	2%	1%	3%	—	2%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.37	0.13	1.47	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	3.58	261	265	0.38	0.01	0.39	278
Mit.	0.37	0.13	1.47	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	3.58	256	260	0.37	0.01	0.39	273
% Reduced	—	—	—	—	—	—	—	—	—	—	—	2%	2%	1%	3%	—	2%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459
Area	1.50	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	45.9	45.9	0.02	< 0.005	—	47.0
Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	214	214	0.04	< 0.005	—	216
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	2.20	0.68	9.76	0.02	0.02	1.29	1.32	0.02	0.33	0.35	21.6	1,698	1,720	2.29	0.07	5.17	1,803
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Area	1.08	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	214	214	0.04	< 0.005	—	216
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	1.76	0.69	5.52	0.01	0.02	1.29	1.31	0.02	0.33	0.35	21.6	1,626	1,648	2.29	0.07	0.46	1,727
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.65	0.55	5.44	0.01	0.01	1.24	1.24	0.01	0.31	0.32	—	1,351	1,351	0.07	0.06	2.03	1,372
Area	1.37	0.02	2.58	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	10.4	10.4	< 0.005	< 0.005	—	10.5
Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	214	214	0.04	< 0.005	—	216
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	2.03	0.70	8.08	0.01	0.02	1.24	1.26	0.02	0.31	0.33	21.6	1,577	1,599	2.28	0.07	2.36	1,679
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227
Area	0.25	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.72	1.72	< 0.005	< 0.005	—	1.74
Energy	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	35.4	35.4	0.01	< 0.005	—	35.7
Water	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73
Waste	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	0.37	0.13	1.47	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	3.58	261	265	0.38	0.01	0.39	278

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459
Area	1.50	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	45.9	45.9	0.02	< 0.005	—	47.0
Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	182	182	0.02	< 0.005	—	183
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	2.20	0.68	9.76	0.02	0.02	1.29	1.32	0.02	0.33	0.35	21.6	1,666	1,688	2.28	0.07	5.17	1,770
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Area	1.08	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2

Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	182	182	0.02	< 0.005	—	183
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	1.76	0.69	5.52	0.01	0.02	1.29	1.31	0.02	0.33	0.35	21.6	1,595	1,616	2.28	0.07	0.46	1,695
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.65	0.55	5.44	0.01	0.01	1.24	1.24	0.01	0.31	0.32	—	1,351	1,351	0.07	0.06	2.03	1,372
Area	1.37	0.02	2.58	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	10.4	10.4	< 0.005	< 0.005	—	10.5
Energy	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	182	182	0.02	< 0.005	—	183
Water	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Waste	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	2.03	0.70	8.08	0.01	0.02	1.24	1.26	0.02	0.31	0.33	21.6	1,546	1,567	2.26	0.07	2.36	1,646
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227
Area	0.25	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.72	1.72	< 0.005	< 0.005	—	1.74
Energy	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	30.2	30.2	< 0.005	< 0.005	—	30.4
Water	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73
Waste	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	0.37	0.13	1.47	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	3.58	256	260	0.37	0.01	0.39	273

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.10	1.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	290	290	0.01	< 0.005	—	291
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.98	3.98	< 0.005	< 0.005	—	3.99
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.66	0.66	< 0.005	< 0.005	—	0.66
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.8	32.8	< 0.005	< 0.005	< 0.005	33.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.46	0.46	< 0.005	< 0.005	< 0.005	0.46
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.10	1.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	290	290	0.01	< 0.005	—	291

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.98	3.98	< 0.005	< 0.005	—	3.99
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.66	0.66	< 0.005	< 0.005	—	0.66
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.8	32.8	< 0.005	< 0.005	< 0.005	33.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.46	0.46	< 0.005	< 0.005	< 0.005	0.46
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Foundation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	8.60	8.32	0.01	0.36	—	0.36	0.33	—	0.33	—	1,429	1,429	0.06	0.01	—	1,434
Dust From Material Movement	—	—	—	—	—	1.92	1.92	—	0.99	0.99	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.33	0.32	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.8	54.8	< 0.005	< 0.005	—	55.0

Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.06	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.08	9.08	< 0.005	< 0.005	—	9.11
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	98.3	98.3	< 0.005	< 0.005	0.01	99.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.11	9.46	3.58	0.05	0.09	1.99	2.08	0.09	0.54	0.64	—	7,425	7,425	0.40	1.16	0.45	7,783
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.83	3.83	< 0.005	< 0.005	0.01	3.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.37	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	285	285	0.02	0.04	0.29	299
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.63	0.63	< 0.005	< 0.005	< 0.005	0.64
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.07	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.1	47.1	< 0.005	0.01	0.05	49.5

3.4. Foundation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	8.60	8.32	0.01	0.36	—	0.36	0.33	—	0.33	—	1,429	1,429	0.06	0.01	—	1,434
Dust From Material Movement	—	—	—	—	—	1.92	1.92	—	0.99	0.99	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.33	0.32	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.8	54.8	< 0.005	< 0.005	—	55.0
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.06	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.08	9.08	< 0.005	< 0.005	—	9.11
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	98.3	98.3	< 0.005	< 0.005	0.01	99.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.11	9.46	3.58	0.05	0.09	1.99	2.08	0.09	0.54	0.64	—	7,425	7,425	0.40	1.16	0.45	7,783
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.83	3.83	< 0.005	< 0.005	0.01	3.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.37	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	285	285	0.02	0.04	0.29	299
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.63	0.63	< 0.005	< 0.005	< 0.005	0.64
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.07	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.1	47.1	< 0.005	0.01	0.05	49.5

3.5. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.69	6.38	7.83	0.01	0.27	—	0.27	0.25	—	0.25	—	1,469	1,469	0.06	0.01	—	1,474
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.81	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	187	187	0.01	< 0.005	—	188
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.9	30.9	< 0.005	< 0.005	—	31.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.21	2.62	0.00	0.00	0.58	0.58	0.00	0.14	0.14	—	582	582	0.03	0.02	0.06	589
Vendor	0.01	0.35	0.17	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	296	296	0.01	0.04	0.02	308
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.35	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	75.1	75.1	< 0.005	< 0.005	0.12	76.1
Vendor	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	37.6	37.6	< 0.005	0.01	0.04	39.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.4	12.4	< 0.005	< 0.005	0.02	12.6
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.22	6.22	< 0.005	< 0.005	0.01	6.50

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
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3.6. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	6.38	7.83	0.01	0.27	—	0.27	0.25	—	0.25	—	1,469	1,469	0.06	0.01	—	1,474
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.81	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	187	187	0.01	< 0.005	—	188
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.9	30.9	< 0.005	< 0.005	—	31.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.19	0.21	2.62	0.00	0.00	0.58	0.58	0.00	0.14	0.14	—	582	582	0.03	0.02	0.06	589
Vendor	0.01	0.35	0.17	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	296	296	0.01	0.04	0.02	308
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.35	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	75.1	75.1	< 0.005	< 0.005	0.12	76.1
Vendor	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	37.6	37.6	< 0.005	0.01	0.04	39.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.4	12.4	< 0.005	< 0.005	0.02	12.6
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.22	6.22	< 0.005	< 0.005	0.01	6.50
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	6.04	7.79	0.01	0.24	—	0.24	0.22	—	0.22	—	1,469	1,469	0.06	0.01	—	1,474
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.01	1.30	< 0.005	0.04	—	0.04	0.04	—	0.04	—	244	244	0.01	< 0.005	—	245

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.18	0.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.5	40.5	< 0.005	< 0.005	—	40.6
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.19	2.45	0.00	0.00	0.58	0.58	0.00	0.14	0.14	—	570	570	0.03	0.02	0.05	577
Vendor	0.01	0.33	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	290	290	0.01	0.04	0.02	303
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.43	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	96.2	96.2	< 0.005	< 0.005	0.15	97.5
Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	48.3	48.3	< 0.005	0.01	0.06	50.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.02	16.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.35
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	6.04	7.79	0.01	0.24	—	0.24	0.22	—	0.22	—	1,469	1,469	0.06	0.01	—	1,474
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.01	1.30	< 0.005	0.04	—	0.04	0.04	—	0.04	—	244	244	0.01	< 0.005	—	245
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.18	0.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.5	40.5	< 0.005	< 0.005	—	40.6
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.19	2.45	0.00	0.00	0.58	0.58	0.00	0.14	0.14	—	570	570	0.03	0.02	0.05	577
Vendor	0.01	0.33	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	290	290	0.01	0.04	0.02	303
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.43	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	96.2	96.2	< 0.005	< 0.005	0.15	97.5

Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	48.3	48.3	< 0.005	0.01	0.06	50.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.02	16.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.35
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architect ural Coatings	27.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.02	4.02	< 0.005	< 0.005	—	4.04
Architect ural Coatings	0.83	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.67	0.67	< 0.005	< 0.005	—	0.67
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.49	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	114	114	0.01	< 0.005	0.01	115
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.49	3.49	< 0.005	< 0.005	0.01	3.53
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Architectural Coating (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	27.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.02	4.02	< 0.005	< 0.005	—	4.04
Architectural Coatings	0.83	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.67	0.67	< 0.005	< 0.005	—	0.67
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.49	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	114	114	0.01	< 0.005	0.01	115
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.49	3.49	< 0.005	< 0.005	0.01	3.53
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.69	0.51	5.93	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,436	1,436	0.07	0.06	4.84	1,459
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.68	0.56	5.47	0.01	0.01	1.29	1.30	0.01	0.33	0.34	—	1,376	1,376	0.07	0.06	0.13	1,396
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.12	0.10	0.99	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	224	224	0.01	0.01	0.34	227

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Mid Rise	—	—	—	—	—	—	—	—	—	—	—	31.7	31.7	0.02	< 0.005	—	32.6
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Total	—	—	—	—	—	—	—	—	—	—	—	50.2	50.2	0.02	< 0.005	—	51.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	31.7	31.7	0.02	< 0.005	—	32.6
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Total	—	—	—	—	—	—	—	—	—	—	—	50.2	50.2	0.02	< 0.005	—	51.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	5.24	5.24	< 0.005	< 0.005	—	5.40
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	3.08	3.08	< 0.005	< 0.005	—	3.17
Total	—	—	—	—	—	—	—	—	—	—	—	8.32	8.32	< 0.005	< 0.005	—	8.56

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Mid Rise	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Total	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Total	—	—	—	—	—	—	—	—	—	—	—	18.6	18.6	0.01	< 0.005	—	19.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	3.08	3.08	< 0.005	< 0.005	—	3.17
Total	—	—	—	—	—	—	—	—	—	—	—	3.08	3.08	< 0.005	< 0.005	—	3.17

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Mid Rise	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartment Mid Rise	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartment Mid Rise	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	27.1	27.1	< 0.005	< 0.005	—	27.2
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	27.1	27.1	< 0.005	< 0.005	—	27.2

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Mid Rise	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartment Mid Rise	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.01	0.13	0.05	< 0.005	0.01	—	0.01	0.01	—	0.01	—	164	164	0.01	< 0.005	—	164
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartment Mid Rise	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	27.1	27.1	< 0.005	< 0.005	—	27.2
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	27.1	27.1	< 0.005	< 0.005	—	27.2

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
--------	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Consumer Products	0.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.42	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
Total	1.50	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	45.9	45.9	0.02	< 0.005	—	47.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Consumer Products	0.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.08	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.39	0.39	< 0.005	< 0.005	—	0.40
Consumer Products	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	0.05	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.33	1.33	< 0.005	< 0.005	—	1.34
Total	0.25	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.72	1.72	< 0.005	< 0.005	—	1.74

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Consumer Products	0.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.42	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
Total	1.50	0.03	3.77	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	45.9	45.9	0.02	< 0.005	—	47.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2
Consumer Products	0.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.08	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	34.2	34.2	0.02	< 0.005	—	35.2

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.39	0.39	< 0.005	< 0.005	—	0.40
Consumer Products	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.05	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.33	1.33	< 0.005	< 0.005	—	1.34
Total	0.25	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.72	1.72	< 0.005	< 0.005	—	1.74

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartments	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Mid Rise	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.29	2.35	5.63	0.34	0.01	—	16.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	0.54	0.39	0.93	0.06	< 0.005	—	2.73

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	—	64.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	—	10.6

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	0.33
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
----------------	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	10/1/2025	10/7/2025	5.00	5.00	—
Foundation	Grading	10/8/2025	10/27/2025	5.00	14.0	—

Building Construction	Building Construction	10/28/2025	3/26/2026	5.00	108	—
Architectural Coating	Architectural Coating	3/12/2026	3/26/2026	5.00	11.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Tractors/Loaders/Back hoes	Diesel	Average	1.00	8.00	84.0	0.37
Foundation	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
Foundation	Tractors/Loaders/Back hoes	Diesel	Average	1.00	7.00	84.0	0.37
Foundation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	4.00	367	0.29
Building Construction	Forklifts	Diesel	Average	2.00	6.00	82.0	0.20
Building Construction	Tractors/Loaders/Back hoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Pumps	Diesel	Average	2.00	6.00	11.0	0.74
Building Construction	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	10.0	0.56
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Tractors/Loaders/Back hoes	Diesel	Average	1.00	8.00	84.0	0.37
Foundation	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
Foundation	Tractors/Loaders/Back hoes	Diesel	Average	1.00	7.00	84.0	0.37
Foundation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38

Building Construction	Cranes	Diesel	Average	1.00	4.00	367	0.29
Building Construction	Forklifts	Diesel	Average	2.00	6.00	82.0	0.20
Building Construction	Tractors/Loaders/Back hoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Pumps	Diesel	Average	2.00	6.00	11.0	0.74
Building Construction	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	10.0	0.56
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	2.50	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Foundation	—	—	—	—
Foundation	Worker	7.50	18.5	LDA,LDT1,LDT2
Foundation	Vendor	—	10.2	HHDT,MHDT
Foundation	Hauling	107	20.0	HHDT
Foundation	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	44.4	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	9.31	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—

Architectural Coating	Worker	8.88	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	2.50	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Foundation	—	—	—	—
Foundation	Worker	7.50	18.5	LDA,LDT1,LDT2
Foundation	Vendor	—	10.2	HHDT,MHDT
Foundation	Hauling	107	20.0	HHDT
Foundation	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	44.4	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	9.31	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	8.88	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	93,747	31,249	1,274	142	1,699

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	0.00	0.00	—
Foundation	—	12,000	5.25	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Mid Rise	—	0%
Enclosed Parking with Elevator	0.65	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	79.6	0.03	< 0.005
2026	0.00	68.5	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Apartments Mid Rise	209	210	173	74,452	1,811	1,823	1,504	645,760
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Apartments Mid Rise	209	210	173	74,452	1,811	1,823	1,504	645,760
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0

Electric Fireplaces	46
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	46
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
93747.375	31,249	1,274	142	1,699

5.10.3. Landscape Equipment

Season	Unit	Value
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Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Apartments Mid Rise	168,628	68.5	0.0330	0.0040	510,915
Enclosed Parking with Elevator	98,930	68.5	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Apartments Mid Rise	0.00	68.5	0.0330	0.0040	510,915
Enclosed Parking with Elevator	98,930	68.5	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
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Apartments Mid Rise	1,714,595	155,505
Enclosed Parking with Elevator	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Mid Rise	1,714,595	155,505
Enclosed Parking with Elevator	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Mid Rise	34.0	—
Enclosed Parking with Elevator	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Mid Rise	34.0	—
Enclosed Parking with Elevator	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0

Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
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5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	17.8	annual days of extreme heat
Extreme Precipitation	7.50	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	76.9
AQ-PM	54.2
AQ-DPM	82.2
Drinking Water	71.1
Lead Risk Housing	33.3
Pesticides	0.00
Toxic Releases	65.5
Traffic	42.4
Effect Indicators	—
CleanUp Sites	53.5
Groundwater	30.9
Haz Waste Facilities/Generators	79.6
Impaired Water Bodies	0.00
Solid Waste	52.9
Sensitive Population	—
Asthma	9.15
Cardio-vascular	13.3
Low Birth Weights	66.3
Socioeconomic Factor Indicators	—
Education	3.11
Housing	59.3
Linguistic	69.8
Poverty	48.7
Unemployment	9.72

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	78.44219171
Employed	99.6407032
Median HI	69.65225202
Education	—
Bachelor's or higher	97.89554729
High school enrollment	6.377518286
Preschool enrollment	71.52572822
Transportation	—
Auto Access	20.85204671
Active commuting	90.24765815
Social	—
2-parent households	29.43667394
Voting	56.34543821
Neighborhood	—
Alcohol availability	34.80046195
Park access	81.35506224
Retail density	98.58847684
Supermarket access	94.25125112
Tree canopy	62.64596433
Housing	—
Homeownership	12.04927499
Housing habitability	19.27370717
Low-inc homeowner severe housing cost burden	12.92185294
Low-inc renter severe housing cost burden	87.15513923
Uncrowded housing	69.47260362
Health Outcomes	—

Insured adults	87.86090081
Arthritis	95.1
Asthma ER Admissions	82.9
High Blood Pressure	92.9
Cancer (excluding skin)	47.4
Asthma	96.9
Coronary Heart Disease	93.8
Chronic Obstructive Pulmonary Disease	98.1
Diagnosed Diabetes	96.7
Life Expectancy at Birth	84.1
Cognitively Disabled	21.0
Physically Disabled	15.4
Heart Attack ER Admissions	87.8
Mental Health Not Good	95.6
Chronic Kidney Disease	95.6
Obesity	92.5
Pedestrian Injuries	44.5
Physical Health Not Good	98.0
Stroke	95.7
Health Risk Behaviors	—
Binge Drinking	21.6
Current Smoker	95.4
No Leisure Time for Physical Activity	97.5
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	50.1
Elderly	33.4

English Speaking	49.1
Foreign-born	65.0
Outdoor Workers	94.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	24.5
Traffic Density	60.3
Traffic Access	87.4
Other Indices	—
Hardship	2.8
Other Decision Support	—
2016 Voting	51.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	41.0
Healthy Places Index Score for Project Location (b)	82.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	46 apartments located in a 46,295 SF, 4-story building, built on top of a 67-space subterranean parking garage. Total garden space = 9,072 SF. Lot is 0.65 acres (28,350 SF).
Construction: Construction Phases	Construction anticipated to start no sooner than October 2025. Minimal site prep needed to remove a few trees.
Construction: Off-Road Equipment	Minimal site prep for tree removal. No grading. In foundation phase, removed grader and added excavator. Added pumps and cement mixers to construction phase.
Operations: Vehicle Data	Daily trip generation of 4.57 trips/DU from traffic study. Saturday and Sunday trip gen rates of 4.57 trips/DU and 3.77 trips/DU obtained from ITE for land use 221.
Operations: Hearths	No wood burning stoves or fireplaces. Assumed that all heating/fireplaces will be electric per current Title 24 requirements.

Source: EMFAC2021 (v1.0.1) Emissions Inventory

Region Type: Air Basin

Region: South Coast

Calendar Year: 2025

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Trips	Energy Consumption	Fuel Consumption	Fuel Consumption	Total Fuel Consumption	Total VMT	Total VMT	Miles Per Gallon	Vehicle Class
South Coast	2025	HHDT	Aggregate	Aggregate	Gasoline	54.83401411	1097.118954	0	0.915660885	915.6608849	2033428.223	3783.739566	12499201.56	6.15	HHDT
South Coast	2025	HHDT	Aggregate	Aggregate	Diesel	95337.36817	1459640.636	0	1919.938673	1919938.673		11745346.31			
South Coast	2025	HHDT	Aggregate	Aggregate	Electricity	647.565363	8586.113967	125035.0292	0	0		69780.1703			
South Coast	2025	HHDT	Aggregate	Aggregate	Natural Gas	10701.05249	68656.35135	0	112.5738892	112573.8892		680291.3416			
South Coast	2025	LDA	Aggregate	Aggregate	Gasoline	5244723.652	24385315.28	0	7108.358927	7108358.927	7245907.135	210339700.5	233546247.7	32.23	LDA
South Coast	2025	LDA	Aggregate	Aggregate	Diesel	13504.15254	56096.65324	0	9.832104986	9832.104986		408222.3366			
South Coast	2025	LDA	Aggregate	Aggregate	Electricity	314906.6469	1568075.372	5911352.826	0	0		15311111.74			
South Coast	2025	LDA	Aggregate	Aggregate	Plug-in Hybrid	159860.278	661022.2496	1174382.35	127.7161032	127716.1032		7487213.196			
South Coast	2025	LDT1	Aggregate	Aggregate	Gasoline	483367.514	2127610.282	0	708.9359688	708935.9688	709884.4736	17503198.77	17626287.18	24.83	LDT1
South Coast	2025	LDT1	Aggregate	Aggregate	Diesel	161.5260868	453.3891137	0	0.127085477	127.0854768		2967.035899			
South Coast	2025	LDT1	Aggregate	Aggregate	Electricity	1505.26458	7236.189381	25889.93818	0	0		67058.04036			
South Coast	2025	LDT1	Aggregate	Aggregate	Plug-in Hybrid	1033.948372	4275.376518	9086.363765	0.821419376	821.4193759		53063.32883			
South Coast	2025	LDT2	Aggregate	Aggregate	Gasoline	2528171.942	11891190.15	0	4341.426391	4341426.391	4373117.135	104543301.5	106927231	24.45	LDT2
South Coast	2025	LDT2	Aggregate	Aggregate	Diesel	8518.978579	40955.39339	0	11.53683826	11536.83826		366939.3838			
South Coast	2025	LDT2	Aggregate	Aggregate	Electricity	21565.05505	109850.7805	300027.449	0	0		777107.023			
South Coast	2025	LDT2	Aggregate	Aggregate	Plug-in Hybrid	25221.81395	104292.2007	204751.9727	20.15390552	20153.90552		1239883.058			
South Coast	2025	LHDT1	Aggregate	Aggregate	Gasoline	199655.4178	2974568.238	0	565.7929114	565792.9114	785253.6339	7899242.311	12579982.86	16.02	LHDT1
South Coast	2025	LHDT1	Aggregate	Aggregate	Diesel	107539.0383	1352705.817	0	219.4607225	219460.7225		4531936.528			
South Coast	2025	LHDT1	Aggregate	Aggregate	Electricity	2131.529069	29802.51665	83294.25907	0	0		148804.02			
South Coast	2025	LHDT2	Aggregate	Aggregate	Gasoline	30849.1838	459606.8733	0	93.96299335	93962.99335	208962.5987	1145449.689	3183322.084	15.23	LHDT2
South Coast	2025	LHDT2	Aggregate	Aggregate	Diesel	48016.98656	603993.2855	0	114.9996053	114999.6053		2001431.485			
South Coast	2025	LHDT2	Aggregate	Aggregate	Electricity	549.452873	7286.296511	20413.74678	0	0		36440.90994			
South Coast	2025	MCY	Aggregate	Aggregate	Gasoline	246317.3152	492634.6304	0	37.82728892	37827.28892	37827.28892	1575969.655	1575969.655	41.66	MCY
South Coast	2025	MDV	Aggregate	Aggregate	Gasoline	1582911.671	7327873.919	0	3124.528435	3124528.435	3169334.086	61244218.19	63579746.09	20.06	MDV
South Coast	2025	MDV	Aggregate	Aggregate	Diesel	19966.30161	93386.67778	0	32.96063764	32960.63764		783550.3632			
South Coast	2025	MDV	Aggregate	Aggregate	Electricity	23405.95686	119202.2123	325389.6809	0	0		842798.2408			
South Coast	2025	MDV	Aggregate	Aggregate	Plug-in Hybrid	15515.87163	64158.1292	115605.1765	11.8450132	11845.0132		709179.3041			
South Coast	2025	MH	Aggregate	Aggregate	Gasoline	28222.75742	2823.404652	0	55.89330175	55893.30175	67478.95091	271714.048	388622.5468	5.76	MH
South Coast	2025	MH	Aggregate	Aggregate	Diesel	11853.97154	1185.397154	0	11.58564916	11585.64916		116908.4988			
South Coast	2025	MHDT	Aggregate	Aggregate	Gasoline	24266.37368	485521.6046	0	246.6220886	246622.0886	803911.5702	1285729.87	6330495.207	7.87	MHDT
South Coast	2025	MHDT	Aggregate	Aggregate	Diesel	117076.634	1440705.231	0	548.3413637	548341.3637		4914316.485			
South Coast	2025	MHDT	Aggregate	Aggregate	Electricity	1030.710845	13697.48889	58527.95377	0	0		55891.50984			
South Coast	2025	MHDT	Aggregate	Aggregate	Natural Gas	1586.964447	14102.34275	0	8.94811801	8948.11801		74557.34189			
South Coast	2025	OBUS	Aggregate	Aggregate	Gasoline	5130.782804	102656.7023	0	38.98709136	38987.09136	75404.10956	199581.2481	465625.8692	6.18	OBUS
South Coast	2025	OBUS	Aggregate	Aggregate	Diesel	3078.572652	39272.27543	0	33.03961652	33039.61652		233905.0145			
South Coast	2025	OBUS	Aggregate	Aggregate	Electricity	29.09533983	582.1395594	2258.641236	0	0		2147.933443			
South Coast	2025	OBUS	Aggregate	Aggregate	Natural Gas	505.1478218	4495.815614	0	3.377401677	3377.401677		29991.67319			
South Coast	2025	SBUS	Aggregate	Aggregate	Gasoline	2812.998756	11251.99503	0	13.81627409	13816.27409	41147.02398	123623.802	268314.9981	6.52	SBUS
South Coast	2025	SBUS	Aggregate	Aggregate	Diesel	3181.542446	46068.73461	0	8.734797087	8734.797087		64276.54474			
South Coast	2025	SBUS	Aggregate	Aggregate	Electricity	47.38132065	537.5923668	1681.228052	0	0		1453.97051			
South Coast	2025	SBUS	Aggregate	Aggregate	Natural Gas	3209.535885	46474.07961	0	18.59595281	18595.95281		78960.68088			
South Coast	2025	UBUS	Aggregate	Aggregate	Gasoline	892.063682	3568.254728	0	13.80114714	13801.14714	198998.2045	96751.77026	697627.2588	3.51	UBUS
South Coast	2025	UBUS	Aggregate	Aggregate	Diesel	11.19759793	44.79039173	0	0.207460052	207.4600516		1417.05095			
South Coast	2025	UBUS	Aggregate	Aggregate	Electricity	163.9010308	655.6041234	34521.6162	0	0		16501.94536			
South Coast	2025	UBUS	Aggregate	Aggregate	Natural Gas	4881.393278	19525.57311	0	184.9895973	184989.5973		582956.4922			

505-511 South Oak Knoll Avenue Residential Project Noise Analysis

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October 2025



EcoTierra
c o n s u l t i n g

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I. INTRODUCTION AND SUMMARY

1. PURPOSE OF ANALYSIS AND STUDY OBJECTIVES

This Noise Impact Study has been prepared by EcoTierra Consulting to determine the offsite and onsite noise impacts associated with the 505-511 S. Oak Knoll Avenue Residential Project. The following is provided in this report:

- A description of the study area and the proposed project.
- Information regarding the fundamentals of noise.
- Information regarding the fundamentals of vibration.
- A description of the local noise guidelines and standards.
- An evaluation of the current noise environment.
- An analysis of the potential short-term construction-related noise and vibration impacts from the proposed project.
- An analysis of long-term operations-related noise and vibration impacts from the proposed project.
- An evaluation of airport-related noise impacts to the proposed project.

2. PROJECT LOCATION

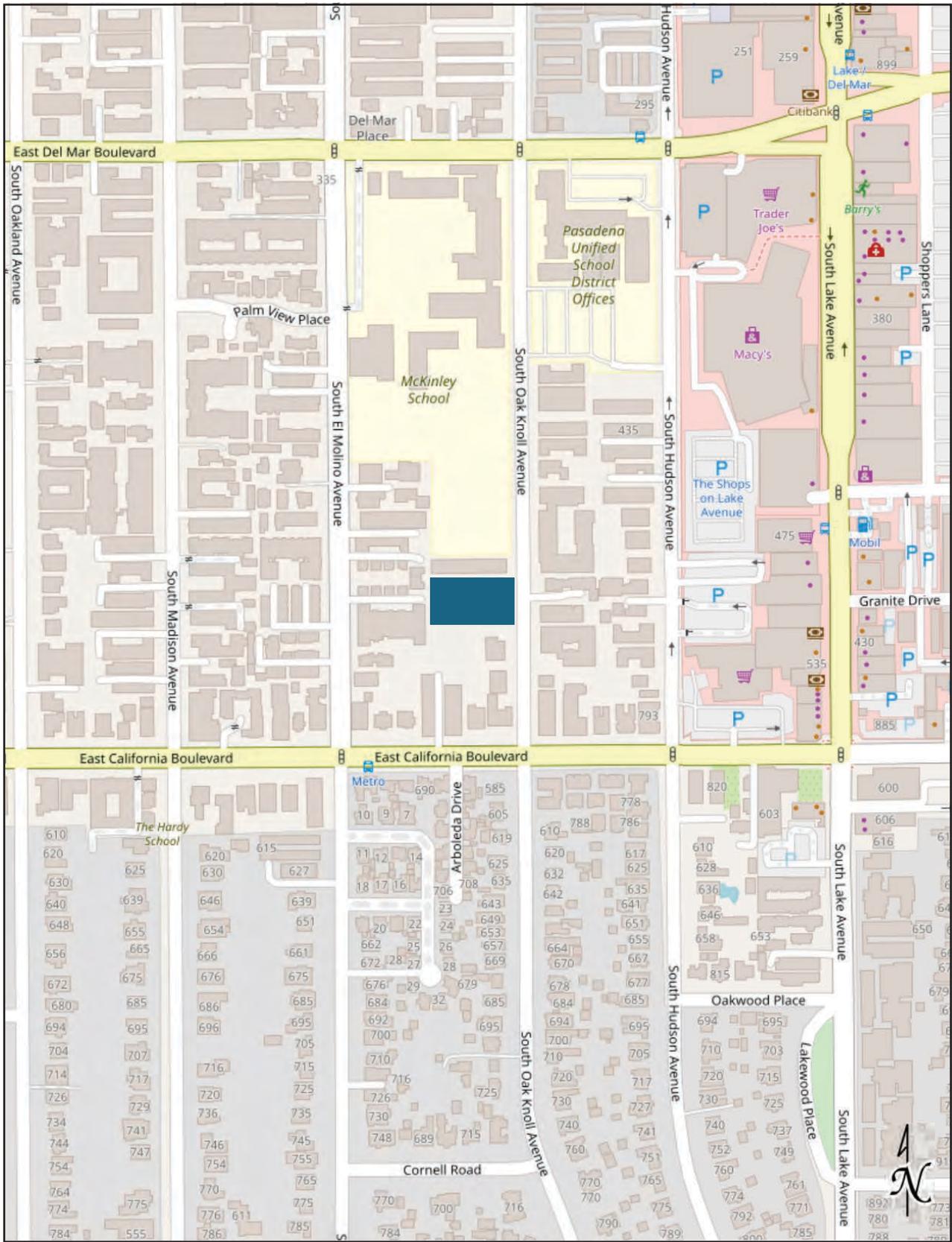
The project site is located at 505 S. Oak Knoll Avenue and 511 S. Oak Knoll Avenue, in the City of Pasadena, with a combined lot size of 28,350 square feet (SF), which is currently vacant with no standing structures.

The vehicle access to the project site's parking garage would be provided at a full access driveway on Oak Knoll Avenue, and the main pedestrian access will also be located on Oak Knoll Avenue. A vicinity map showing the project location of the Site is provided on **Figure 1, Project Location Map**.

3. PROJECT DESCRIPTION

The proposed project consists of the construction and operation of a four-story 46,295 SF multi-family residential building with 46 dwelling units and one level, 67-space, subterranean parking garage. The total garden space is 9,072 SF and the Site is 0.65 acres (28,350 SF). **Figure 2, Site Plan**, illustrates the Site. The Project includes the installation of solar panels per Title 24 Building Code requirements.

The project is anticipated to start construction no sooner than October 2025 and take approximately 6 months to complete. The Project is anticipated to be operational in 2026. The Project would include approximately 12,000 cubic yards (CY) of export.



= Project Site

Source: Open Street Maps, April 2025.

Figure 1
Project Location Maps

4. SUMMARY OF IMPACTS

A. Construction Noise Impacts

Construction noise levels were modeled for each phase using methodology presented in the Road Construction Noise Model (RCNM) User's Guide. Modeled unmitigated noise levels will not exceed 85 dBA when measured within a radius of 100 feet from the source. Construction noise levels are considered to be less than significant.

B. Operational Noise Impacts

The proposed project would not result in a perceptible increase in noise due to the increase of project-related traffic on roadways in the project vicinity. As the project-related increase in traffic noise would not exceed 5 dBA, the project would not contribute to a substantial permanent increase in ambient noise levels in the project vicinity. Impacts are considered less than significant.

On-site noise sources (HVAC and parking lot noise) associated with the proposed project will not result in a significant increase in ambient noise levels at closest receptor locations. Impacts related to project operational noise would be less than significant.

C. Vibration Impacts

Groundborne vibration levels associated with vibration-generating equipment that may be utilized during project construction would not exceed any FTA damage criteria. The project will not be a source of operational vibration. Impacts are considered to be less than significant.

D. Airport Impacts

The project is not located within an airport noise contour and airport-related noise impacts are considered to be less than significant.

II. NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

1. NOISE DESCRIPTIONS

Noise equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{ea}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{ea} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn} , except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason, the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Another noise descriptor that is used primarily for the assessment of aircraft noise impacts is the Sound Exposure Level, which is also called the Single Event Level (SEL). The SEL descriptor represents the acoustic energy of a single event (i.e., an aircraft overflight) normalized to one-second event duration. This is useful for comparing the acoustical energy of different events involving different durations of the noise sources. The SEL is based on an integration of the noise during the period when the noise first rises within 10 dBA of its maximum value and last falls below 10 dBA of its maximum value. The SEL is often 10 dBA greater, or more, than the L_{MAX} since the SEL logarithmically adds the L_{eq} for each second of the duration of the noise.

2. TONE NOISE

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown the humans are more perceptible to changes in noise levels of a pure tone (Caltrans 1998). For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by: 5 dB for center frequencies of 500 Hertz (Hz) and above; by 8 dB for center frequencies between 160 and 400 Hz; and by 15 dB for center frequencies of 125 Hz or less (Department of Health Services 1977).

3. NOISE PROPAGATION

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects, and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

4. GROUND ABSORPTION

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. To be conservative, hard-site conditions were used in this analysis where applicable.

5. TRAFFIC NOISE PREDICTION

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is “barely perceptible,” for reference a doubling of perceived noise levels would require an increase of approximately 10 dBA. However, the 1992 findings of Federal Interagency Committee on Noise (FICON), which assessed changes in ambient noise levels resulting from aircraft operations, found that noise increases as low as 1.5 dB can cause annoyance, when the existing noise levels are already greater than 65 dB. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

6. NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. For a noise barrier to work, it must be high enough and long enough to block the view of a road. A noise barrier is most effective when placed close to the noise source or receiver. A noise barrier can achieve a 5-dBA noise level reduction when it is tall enough to break the line-of-sight. When the noise barrier is a berm instead of a wall, the noise attenuation can be increased by another 3 dBA.

III. GROUND BORNE VIBRATION FUNDAMENTALS

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

1. VIBRATION DESCRIPTORS

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as L_v and is based on the RMS velocity amplitude. A commonly used abbreviation is VdB, which in this text, is when vibration level (L_v) is based on the reference quantity of 1 microinch per second.

2. VIBRATION PERCEPTION

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration.

3. VIBRATION PROPAGATION

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform medium, while groundborne vibrations travel through the earth, which may contain significant geological differences. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However,

unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4. CONSTRUCTION-RELATED VIBRATION LEVEL PREDICTION

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. **Table 1, Vibration Source Levels for Construction Equipment**, gives approximate vibration levels for particular construction activities. The data in Table provides a reasonable estimate for a wide range of soil conditions.

Table 1
Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (Lv) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
<i>Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Table 7-4. September 2018.</i>		

There are no federal vibration standards or regulations adopted by any agency that are applicable to evaluating vibration impacts from land use development projects such as the proposed Project. However, the Federal Transit Administration (FTA) has adopted vibration criteria for use in evaluating vibration impacts from construction activities.¹ The vibration damage criteria adopted by the FTA are shown in **Table 2, Construction Vibration Damage Criteria**.

Table 2
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.50
II. Engineered concrete and masonry (no plaster)	0.30
III. Non-engineered timber and masonry buildings	0.20
IV. Buildings extremely susceptible to vibration damage	0.12
<i>Source: FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.</i>	

¹ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.*

IV. REGULATORY SETTING

The proposed project is located in the City of Pasadena and noise regulations are addressed through the efforts of various federal, State, and local government agencies. The agencies responsible for regulating noise are discussed below.

1. FEDERAL REGULATIONS

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

2. STATE REGULATIONS

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor’s Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community

preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the “normally acceptable” range is used, it any special acoustical is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate treatment or noise mitigation. The “conditionally acceptable” or “normally unacceptable” ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The City of Pasadena has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 3).

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

A. California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

Would the project result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise (temporary): The City of Pasadena's noise ordinance regulates the timing of construction activities. No construction is permitted within 500 feet of a residential district outside of the hours specified under Section 9.36.070 of the City of Pasadena's Municipal Code (7:00 AM to 7:00 PM, Monday through Friday, 8:00 AM to 5:00 PM on Saturday, and at no time on Sundays or holidays). Section 9.36.080 of the City Municipal Code prohibits noise from operation of any powered construction equipment from exceeding 85 dBA Leq at a distance of 100 feet. The City of Pasadena restricts construction activities to the daytime hours. The potential for construction noise impacts to be objectionable depends on the magnitude of noise generated by the construction equipment, the frequency of noise sources during a construction day, and total duration of construction activities. Although construction activity may be exempt from the noise standards in the City's Municipal Code, CEQA requires that potential noise impacts still be evaluated for significance.

Project Operational Noise (permanent): Potential noise impacts are evaluated by local criteria established by the City of Pasadena for stationary source noise control. Section 9.36.090 of the City Municipal Code regulates machinery, equipment, and fans and air conditioning units and prohibits these sources from generating noise that exceeds the ambient noise level by more than 5 dB at the property line of the receiving property.

The City of Pasadena does not have adopted thresholds to assess off-site project-related traffic noise impacts. Therefore, the significant threshold for off-site traffic noise is based on human perceptibility to changes in noise levels (increases), with consideration of existing ambient noise conditions, and the City's guidelines for noise compatible land use. For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

b) Generate excessive groundborne vibration or groundborne noise levels?

The City of Pasadena does not have an adopted significant threshold to assess vibration impacts during construction. For the purposes of this analysis, the project would generate excessive groundborne vibration or groundborne noise levels if the project would exceed the vibration level at which there is a risk of architectural damage per the FTA structural damage criteria (0.12 in/sec for historic structures, 0.2 in/sec for typical wood-framed buildings, or 0.5 in/sec for reinforced concrete, steel, or timber).

3. LOCAL REGULATIONS

The City of Pasadena General Plan and Municipal Code establish the following applicable goals policies related to noise and vibration.

A. City of Pasadena General Plan

The Noise Element of the City's General Plan (revised in December 2002) incorporates noise standards for various land uses, which are based on the California Office of Planning and Research's (OPR) Noise Element Guidelines. **Table 3, City of Pasadena Noise Compatibility Guidelines**, presents the City's noise guidelines for land use planning. The objective of the noise compatibility guidelines is to provide a means of identifying acceptable noise exposure levels for a proposed use in relation to the existing noise environment. Since the proposed project at 500 Cordova Street is a multi-family residential use, the clearly acceptable noise level would be below 65 dBA CNEL, the normally acceptable noise levels would be between 65 and 70 dBA CNEL, the conditionally acceptable noise levels would be less than 75 dBA CNEL.

B. City of Pasadena Municipal Code

Project operations will be subject to City ordinances.

Chapter 9.36, Noise Restrictions (Noise Ordinance), of the Pasadena Municipal Code (PMC) establishes exterior noise standards by land use and the maximum duration of time that the noise standards may be exceeded without being considered a nuisance punishable by law. As such, the City's Noise Ordinance prohibits any "unnecessary, excessive, or annoying noises" in the City. The Noise Ordinance does not control traffic noise, but applies to all noise sources located on private property.

According to Section 9.36.050 of the PMC, the City generally limits intrusive noises from exceeding the ambient level at the property line by more than 5 dB, with adjustments made for steady audible tones, impulsive noise, and noise emitted for limited durations. The ambient noise is the actual measured noise level. In addition, Section 9.36.060 sets the interior noise limit for multi-family residential uses to 60 dB during 7:00 AM to 10:00 PM and 50 dB during 10:00 PM to 7:00 AM.

The Noise Ordinance also includes restrictions for construction activities in residential districts. PMC Section 9.36.070 prohibits noise levels generated by construction in or within 500 feet of a residential district from 7:00 PM to 7:00 AM on weekdays, 5:00 PM to 8:00 AM on Saturday, or anytime on Sundays and holidays. In addition, PMC Section 9.36.080 prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dB when measured within a radius of 100 feet from the source.

**Table 3
City of Pasadena Noise Compatibility Guidelines**

		Exterior Noise Level (CNEL dBA)						
Land Use Category		50	55	60	65	70	75	80
Residential – low density single family, duplex, mobile homes								
Residential- multiple family and mixed-use commercial/residential uses								
Transient lodging – motels, hotels								
Schools, libraries, churches, hospitals, nursing homes								
Auditoriums, concert halls, amphitheaters								
Sports arena, outdoor spectator sports								
Playground, neighborhood parks								
Golf courses, riding stables, water recreation, cemeteries								
Office buildings, business commercial and professional								
Industrial, manufacturing, utilities Agriculture, mining								
	Clearly Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.						
	Normally Acceptable	New construction or development should be undertaken after an analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.						
	Conditionally Acceptable	New construction or development proceeds, an analysis of the noise reduction requirements should be made and needed noise insulation features included in the design						
	Normally Unacceptable	New construction or development should generally not be undertaken, unless it can be demonstrated that an interior level of 45 dBA can be achieved.						
<i>Source:</i> <i>City of Pasadena General Plan Noise Element</i>								

V. EXISTING NOISE CONDITIONS

To determine the existing noise level environment, short-term noise measurements were taken in the project study area at five locations in the project vicinity. The following describes the measurement procedures, measurement locations, and the noise measurement results.

1. MEASUREMENT PROCEDURE AND CRITERIA

To ascertain the existing noise at and adjacent to the project site, field monitoring was conducted on February 4, 2025. The field survey noted that noise within the proposed project area is generally characterized by traffic noise. The nearest airport is the San Gabriel Valley Airport, which is located approximately 6.7 miles southeast of the project site. The project site falls well outside the 65 dBA airport noise contour, and is not considered as a source that contributes to the ambient noise levels on the project site.

A. Noise Measurement Equipment

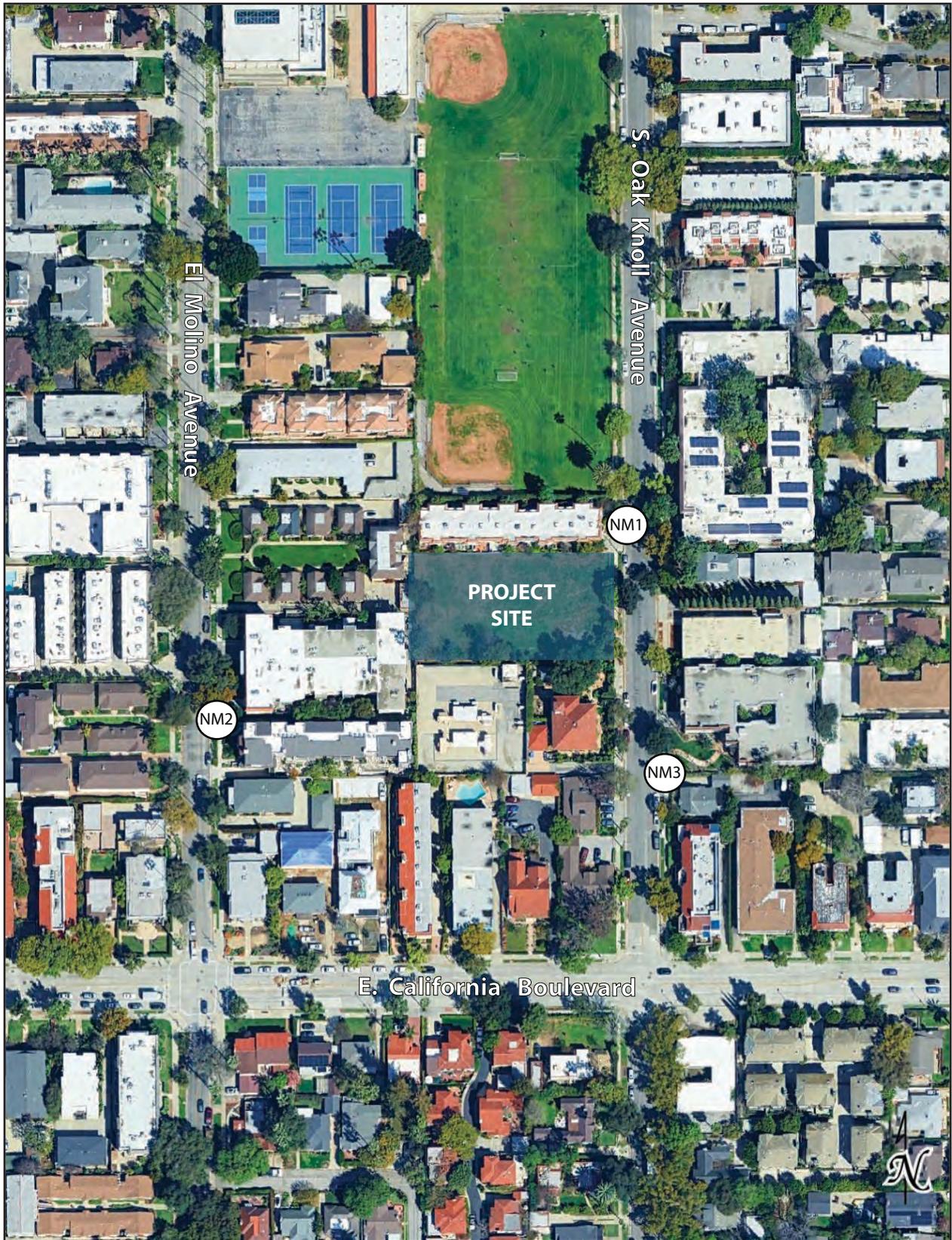
Noise monitoring was performed using an American National Standards Institute (ANSI Section S14 1979, Type 1) Larson Davis model LxT sound level meter. The sound level meter was programmed in “slow” mode to record the sound pressure level at one second intervals for in A-weighted form. The sound level meter and microphone were mounted approximately five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before monitoring using Larson Davis Cal 250. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

B. Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise measurements of the current noise sources impacting the vicinity of the project site and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The site is shown in **Figure 3, Noise Monitoring Locations**, on the following pages. **Appendix A** (of this analysis technical report) includes a photographic index of the study areas and noise level measurement locations.

C. Noise Measurement Timing and Climate

The noise measurements were recorded between 1:37 PM and 2:52 PM on February 4, 2025. At the start of the noise monitoring, the temperature was 61°F, 57 percent humidity, 50 percent clouds, filtered sun, and calm wind conditions (5 mph).



(NM#) = Noise Location

■ = Project Site

Source: Google Earth, November 2023.

Figure 3
Noise Monitoring Locations

2. NOISE MEASUREMENT RESULTS

The noise measurements were taken at three (3) locations in the project vicinity. The results of the noise level measurements are provided below in **Table 4, Existing Noise Level Measurements (dBA)**. The dominant noise source in the area was traffic, with secondary noise from the William McKinley Art school north of the site, city ambiance, pedestrians, birds, and the occasional low-altitude aircraft.

Table 4
Existing Noise Level Measurements (dBA)

Site Location	Description	L _{eq}	L _{MAX}	L _{MIN}
NM 1	North of the site, adjacent to the multi-family residential use located at 501 S. Oak Knoll Avenue.	62.9	74.7	40.7
NM 2	West of the site, on the sidewalk adjacent to the multi-family residential uses located at 518 and 536 S. El Molino Avenue.	61.1	71.3	44.2
NM 3	South of the site, on the sidewalk adjacent to the multi-family residential use located at 534 S. Oak Knoll Avenue.	62.3	84.0	42.9

As shown in **Table 4**, receptors in the project vicinity are subject to average noise levels ranging from 61.1 dBA leq to 62.9 dBA leq, with maximum noise levels reaching as high as 84.0 dBA adjacent to the property line of the multi-family residential use located at 534 S. Oak Knoll Avenue, approximately 127 feet southeast of the site.

VI. NOISE AND VIBRATION IMPACT ANALYSES

Consistent with the California Environmental Quality Act (CEQA) and the CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

According to the CEQA checklist, to determine whether impacts to noise resources are significant environmental effects, the following topics are analyzed and evaluated:

- Exceedance of noise standards for construction and operational noise.
- Construction noise.
- Groundborne vibration.
- Operational noise.
- Airport noise.

Each of these thresholds is analyzed below.

1. EXCEEDANCE OF NOISE STANDARDS

This impact discussion analyzes the potential for project construction noise to cause an exposure of persons to or generation of noise levels in excess of established City of Pasadena noise standards or applicable standards of other agencies.

Noise levels in the project area would be influenced by construction activities.

As stated previously, According to Section 9.36.070, noise from construction activity is prohibited within 500 feet of a residential district from 7:00 PM to 7:00 AM on weekdays, 5:00 PM to 8:00 AM on Saturday, or anytime on Sundays and holidays. In addition, PMC Section 9.36.080 prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dBA when measured within a radius of 100 feet from the source.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. The nearest sensitive receptors to the Cordova Site include: the multi-family residential use

located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue (NM1); the single-family residential use located adjacent to the southern boundary of the Site, at 541 S. Oak Knoll Avenue (NM3); the multi-family residential uses located adjacent to the western boundary of the Site, at 518 S. El Molino Avenue (NM2); the multi-family residential use located approximately 80 feet northeast of the Site, at 500 S. Oak Knoll Avenue (NM1); and the multi-family residential uses located approximately 75 feet east of the Site, at 510, 512, and 516 S. Oak Knoll Avenue (NM1).

Please see Figure 3, Noise Monitoring Locations above, and Table 5 below.

**Table 5
Closest Receptors to the Project Site**

Type of use	Description	Closest Noise Measurement Location ID	Structure type/FTA building category	Distance from façade of receptor to project boundary
Residential	Multi-family residential use located adjacent to the northern boundary of the Site, at 501 S. Oak Knoll Avenue.	NM1	II. Engineered concrete and masonry (no plaster)	~15 feet
Residential	Multi-family residential use located west of the western boundary of the Site, at 500 S. El Molino Avenue (Historic).	NM2	IV. Buildings extremely susceptible to vibration damage	~1 foot
Residential	Multi-family residential use located west of the western boundary of the Site, at 518 S. El Molino Avenue.	NM2	II. Engineered concrete and masonry (no plaster)	~15 feet
Residential	Single-family residential use located south of the Site at 541 S. Oak Knoll Avenue (Historic).	NM3	IV. Buildings extremely susceptible to vibration damage	~25 feet
Residential	Multi-family residential use located east of the Site, at 512-516 S. Oak Knoll Avenue.	NM3	II. Engineered concrete and masonry (no plaster)	~75 feet
Residential	Single-family residential use located east of the Site, at 510 S. Oak Knoll Avenue.	NM3	III. Non-engineered timber and masonry buildings	~90 feet

**Table 5
Closest Receptors to the Project Site**

Government /Industrial	Electric Substation located directly south of the Site, at 525 S. Oak Knoll Avenue	NM5	I. Reinforced-concrete, steel or timber (no plaster)	~1 foot
<p>1 <i>The property at 500 S. El Molino Avenue, (Cornish Manor Court, constructed ca. 1923) is designated as a landmark property.</i></p> <p>2 <i>The southern carport is located ~1 foot from the project boundary. The residential building is located ~ 13 feet from the project boundary.</i></p> <p>3 <i>The property at 541 S. Oak Knoll Avenue, Engine Company #34, constructed ca. 1917, and designed by J.J. Blick is designated as a landmark property.</i></p>				

Short-term noise impacts could occur during construction activities from either the noise impacts created from the transport of workers and movement of construction materials to and from the project site, or from the noise generated onsite during: demolition, grading, building, paving and architectural coating activities.

Construction noise levels will vary significantly based upon the size and topographical features of the active construction zone, duration of the work day, and types of equipment employed, as indicated in **Table 6, Typical Construction Equipment Noise Levels**. 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. Although there would be a relatively high single event noise exposure potential, resulting in potential short-term intermittent annoyances, the effect in long-term ambient noise levels would be small when averaged over longer time. As shown by the ambient noise level measurements in Table 3, Existing Noise Level Measurements (see Section V. Existing Noise Conditions of this report), the project vicinity is already exposed to a maximum noise level of 84.0 dBA L_{max} .

Construction noise associated with the Project was calculated utilizing methodology presented in the FTA Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the Project Site (see Appendix C for details). Distance to the receptor is 100 feet per PMC Section 9.36.080, which prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dB when measured within a radius of 100 feet from the source.

Table 7
Construction Noise by Phase - 100 feet from Source

Construction Phase and Equipment Type	No. of Equipment	Equipment Lmax at 50 feet, dbA ^{1,2}	Distance to Receptor	Equipment Usage Percent	Noise Level Leq (dBA) at Receptor
Site Preparation					
Excavators	1	81	100	40	71.0
Tractors/Loaders/Backhoes	1	79	100	40	69.0
Total Noise Level For Phase					73.1
Excavation/Foundation					
Excavators	1	81	100	40	71.0
Sheep's Foot Roller	1	80	100	40	70.0
Tractors/Loaders/Backhoes	1	79	100	40	69.0
Total Noise Level For Phase					74.8
Sub-Grade and Building Construction					
Cranes	1	81	100	16	67.0
Forklifts	2	58	100	50	52.0
Excavators	1	81	100	40	71.0
Tractors/Loaders/Backhoes	2	79	100	40	72.0
Pumps	2	77	100	20	67.0
Cement and Mortar Mixers	1	79	100	40	69.0
Total Noise Level For Phase					76.7
Architectural Coating					
Air Compressors	1	78	100	40	68.0
Total Noise Level For Phase					68.0
<p>¹ Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual, September 2018.</p> <p>² Source: Seixas, N. and Neitzel, R., 2004, "Noise exposure and hearing protection device use among construction workers in Washington state," Univ. of Washington Dept. of Env. and Occup. Health Sciences Rept., accessed Sept 10 2005 at http://staff.washington.edu/rneitzel/Noise_HPDPdf.</p>					

As shown in Table 7, the highest construction noise level, 76.7 dBA, would occur during the sub-grade and building construction phase. Therefore, construction noise levels will not exceed 85 dBA at a distance of 100 feet from the source.²

Impacts from construction noise are considered to be less than significant, no noise reduction measures are required.

2. GROUNDBORNE VIBRATION

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the

² See Appendix C for calculations at a distance of 100 feet from the source.

project area would be influenced by construction activities and from the ongoing operations of the proposed project.

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.³ In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.⁴ Ground-borne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance away from the source of the vibration.

The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ground vibrations from construction activities rarely reach levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to a construction site. The City of Pasadena does not consider annoyance from construction vibration a significant impact. Significant impacts would only occur for building damage and/or if the vibrations would interfere with the use of sensitive receptors.

A. Construction Vibration

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The highest degree of groundborne vibration on-site would be generated during the excavation/foundation phase due to the use of a small dozer/excavator and tractor/loader/backhoe. Based on the Federal Transit Administration (FTA) data (see Table 1), vibration velocities from this type of equipment are estimated to be approximately 0.003 inch-per-second PPV at 25 feet from the source of activity.⁵ Loaded trucks would be used to transport exported material offsite during the site preparation and foundation/excavation phase. Vibration velocities from a loaded truck would be approximately 0.076 inch-per-second PPV at a distance of 25 feet. The closest a loaded truck would get to any building would be 25 feet. Therefore, the vibration level from a loaded truck would not exceed even the most stringent 0.12 inches-per-second PPV threshold for category IV buildings (buildings extremely susceptible to vibration damage) and vibration impacts from loaded trucks are not anticipated.

³ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Section 7, 2018.

⁴ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Section 7, 2018.

⁵ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

The nearest buildings that could incur vibration damage from construction-related activities at the Site would be the multi-family residential buildings located at 500 S. El Molino Avenue, as the southern carport located on the residential lot is directly adjacent to the Site's western boundary (façade of the carport building is located approximately 1 foot from the project's western boundary). The building is designated as historic. The other historic building is the single-family residential use located at 541 S. Oak Knoll Avenue, with the building façade located approximately 25 feet from the project's southern boundary. The electrical substation located at 525 S. Oak Knoll Avenue, adjacent to the Site's southern boundary also has a building façade that is approximately 1 foot from the project's southern boundary. The multi-family residential use located 518 S. El Molino Avenue has a building façade that is approximately 15 feet from the project's western boundary. The multi-family residential use located at 501 S. Oak Knoll Avenue is located approximately 15 feet from the project's northern boundary. Other vibration-sensitive buildings are located further than 15 feet from the project boundaries and would not be affected by vibration from construction activities (see Table 5).

At a distance of 1 foot, the vibration level from the small bulldozer or tractor/loader/backhoe would be 0.375 inches-per-second PPV, which would exceed the 0.12 inches-per-second PPV threshold for category IV buildings (buildings extremely susceptible to vibration damage) for the historic buildings at 500 S. El Molino Avenue. However, the vibration from the small bulldozer or tractor/loader/backhoe would not exceed the 0.5 inches-per-second PPV threshold for category I buildings (reinforced-concrete, steel or timber [no plaster]) for the electrical substation building at 525 S. Oak Knoll Avenue.

At a distance of 15 feet, the vibration level from the small bulldozer or tractor/loader/backhoe would be 0.006 inches-per-second, which would not exceed the 0.30 inches-per-second PPV threshold for category II buildings (engineered concrete and masonry [no plaster]) for the multi-family residential buildings located at 518 S. El Molino Avenue to the west and at 501 S. Oak Knoll Avenue to the north. Furthermore, as stated above, a distance of 25 feet, the vibration level from the small bulldozer or tractor/loader/backhoe would be 0.003 inches-per-second PPV, which would not exceed the 0.12 inches-per-second PPV threshold for category IV buildings (buildings extremely susceptible to vibration damage) for the historic building at 541 S. Oak Knoll Avenue.

Therefore, the only buildings that may be impacted by construction vibration are the historic buildings at 500 S. El Molino Avenue, to the west of the project site.

As there is an existing wall located along the western the property line, it is anticipated that the area of activity for the small bulldozer or tractor/loader/backhoe would occur at least 2.5 feet from the wall at the property line. At a distance of 2.5 feet, the vibration level from the small bulldozer or tractor/loader/backhoe would be 0.095 inches-per-second PPV, which would not exceed the 0.12 inches-per-second PPV threshold for category IV buildings (buildings extremely susceptible to vibration damage).

As shown in above, the use of construction equipment would not exceed any FTA damage criteria to nearby buildings. Impacts are considered to be less than significant.

B. Operational Vibration

As the proposed project consists of proposed residential uses, the project does not include any significant sources of operational vibration; no impacts are anticipated.

3. OPERATIONAL NOISE

This impact discussion analyzes the potential for a substantial permanent increase in ambient noise levels in the project vicinity associated with operation of the proposed project, including impacts related to offsite vehicular noise and exposure of neighboring land uses to onsite noise.

A. Parking Noise

The proposed parking areas have the potential to generate noise due to cars entering and exiting, engines accelerating, braking, car alarms, squealing tires, and other general activities associated with people using the parking areas (i.e., talking, opening/closing doors, etc.). Noise levels within the parking areas would fluctuate with the amount of automobile and human activity. Activity levels would be highest in the early morning and evening when the largest number of people would enter and exit. However, these events would occur at low exiting and entering speeds, which would not generate high noise levels. During these times, the noise levels can range from 44 to 63 dBA Leq⁶. The parking area at Site is subterranean and, other than the driveway ramp leading down to the parking spaces, would be shielded by the walls of the parking structure. Therefore, noise generated from within the parking areas would not adversely affect off-site sensitive receptors. Chapter 9.36, of the PMC establishes exterior noise standards by land use and the maximum duration of time that the noise standards may be exceeded without being considered a nuisance punishable by law. As such, the City's Noise Ordinance prohibits any "unnecessary, excessive, or annoying noises" in the City. The Noise Ordinance does not control traffic noise, but applies to all noise sources located on private property. Therefore, through project design, and compliance with existing PMC regulations, noise impacts associated with parking would be less than significant and no mitigation measures are required.

B. Stationary Noise Sources

As part of the Project, HVAC units are anticipated to installed for the proposed use. A typical HVAC unit operates at a noise level of 66 dBA Leq at 3 feet from the source.⁷ The HVAC units will be placed on the flat roof of the building and shielded from the neighboring uses the parapet that would be tall enough to

⁶ Source: Gordon Bricken & Associates, 1996. Estimates are based on actual noise measurements taken at various parking lots.

⁷ Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, June 26, 2015.

completely block the HVAC units from view. The closest receptor would be located at least 20 feet from the closest HVAC unit. The noise generated from operation of the HVAC units would be less than 50 dBA at the closest receptor. As the existing noise levels in the project vicinity exceed 60 dBA (see Table 4), the HVAC would not exceed the ambient noise level.

The design of all mechanical equipment would be required to comply with the regulations. According to Section 9.36.050 of the PMC, the City generally limits intrusive noises from exceeding the ambient level at the property line by more than 5 dB, with adjustments made for steady audible tones, impulsive noise, and noise emitted for limited durations. The project is required to comply with the PMC; therefore, as the HVAC will not exceed ambient noise levels, impacts related to stationary noise sources are considered to be less than significant.

C. Traffic Noise

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL. In order for a new noise source to be audible, there would need to be a 3 dBA or greater CNEL noise increase⁸. Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways. The noise impacts related to vehicular traffic were modeled using a version of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108), as modified for CNEL and the “Calveno” energy curves. The existing and existing plus project average daily traffic (ADT) were calculated from the PM peak hour volumes given in the *Iteris 505 South Oak Knoll Avenue Residential Local Mobility Analysis*. FHWA calculation spreadsheets are included in Appendix C.

The calculated noise levels in **Table 8, Project-Related Increase in Traffic Noise** below show that there would be a marginal increase in noise due to the increase of project-related traffic on roadways in the project vicinity. The highest increase in traffic noise would be 0.2 dB at the road segment of Oak Knoll Avenue south of Del Mar Boulevard. As the project-related increase in traffic noise does not exceed 3 dBA, the project would not contribute to a substantial permanent increase in ambient noise levels in the project vicinity. Impacts are considered to be less than significant.

⁸ *FTA Highway Traffic Noise: Analysis and Abatement Guidance, page 9.*

Table 8: Project-Related Increase in Traffic Noise

Road Segments	Existing		Existing Plus Project		
	ADT	dB CNEL*	ADT	Total dB CNEL*	Project-Increase
El Molino Avenue					
n/o Del Mar Blvd	2,860	62.3	2,870	62.3	0.0
s/o Del Mar Blvd	5,060	64.7	5,060	64.7	0.0
n/o California Blvd	3,060	62.6	3,060	62.6	0.0
s/o California Blvd	4,090	63.8	4,090	63.8	0.0
Oak Knoll Avenue					
n/o Del Mar Blvd	570	55.3	580	55.3	0.0
s/o Del Mar Blvd	1,340	59.0	1,420	59.2	0.2
Lake Avenue					
n/o Del Mar Blvd	7,060	66.2	7,080	66.2	0.0
s/o Del Mar Blvd	8,890	67.2	8,890	67.2	0.0
n/o California Blvd	5,550	65.1	5,550	65.1	0.0
s/o California Blvd	7,010	66.2	7,010	66.2	0.0
Del Mar Boulevard					
w/o El Molino Ave	10,130	67.8	10,150	67.8	0.0
e/o El Molino Ave	9,620	67.5	9,660	67.5	0.0
w/o Oak Knoll Ave	11,120	68.2	11,140	68.2	0.0
e/o Oak Knoll Ave	9,930	67.7	9,960	67.7	0.0
w/o Lake Ave	8,740	67.1	8,790	67.1	0.0
e/o Lake Ave	10,500	67.9	10,510	67.9	0.0
California Boulevard					
w/o El Molino Ave	7,950	66.7	7,970	66.7	0.0
e/o El Molino Ave	9,470	67.5	9,490	67.5	0.0
w/o Lake Ave	9,610	67.5	9,630	67.5	0.0
e/o Lake Ave	7,180	66.3	7,190	66.3	0.0
* Noise levels at 50 feet from the roadway centerline. The uniform distance of 50 feet allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies.					

4. AIRPORT NOISE

This impact discussion analyzes the potential for nearby airports or private airstrips to expose people residing or working in the project area to excessive noise levels. The nearest airport is the San Gabriel Valley Airport, which is located approximately 6.7 miles southeast of the project site. The project site falls well outside the 65 dBA noise contour⁹ and is not considered as a source that contributes to the ambient noise levels on the project site. Impacts are considered to be less than significant.

⁹ Los Angeles County Airport Land Use Plan – 12-19-91 website: <https://planning.lacounty.gov/wp-content/uploads/2022/10/Los-Angeles-County-Airport-Land-Use-Plan.pdf>

VII. NOISE/VIBRATION REDUCTION TECHNIQUES

1. CONSTRUCTION TECHNIQUES

None required.

2. OPERATIONAL TECHNIQUES

None required.

VIII. LIST OF ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
dBA/DD	A-weighted decibel per each doubling of distance
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_{max} , L_{min}	RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. L_{min} is the minimum level.
L_v	Vibration Level
ONAC	Federal Office of Noise Abatement Control
ONC	California Department of Health Services Office of Noise Control
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
PMC	Pasadena Municipal Code
RMS	root mean square
SEL	Single Event Level
sq ft	square feet
UMTA	Urban Mass Transit Administration
VdB	L_v at 1 microinch per second

IX. REFERENCES

- Anon. 1977. Model Community Noise Control Ordinance. Berkley, CA: California Department of Health Services, Office of Noise Control.
- California, State of. Department of Transportation (Caltrans). 2004. Transportation- and Construction-Induced Vibration Guidance Manual. June. Website: <http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf>
- California, State of. Department of Transportation (Caltrans). 2009 and 1998. Technical Noise Supplement. November. Website: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf
- Federal Transit Administration. 2018. Transit Noise and Vibration Impact Assessment. September. Website: http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.
- Iteris. 2025. 505 S Oak Knoll Avenue Residential Local Mobility Analysis. Final Report. March 28.
- Pasadena, City of. 2021. Municipal Code, Section 9.36.080, Noise Ordinance
- Pasadena, City of. 2002. Revised Noise Element of the General Plan. December
- Pasadena, City of. 2015. General Plan Draft EIR. January
- U.S. Department of Transportation. 2006. FHWA Roadway Construction Noise Model User's Guide. January. Website: <http://www.fhwa.dot.gov/environment/noise/rcnm/rcnm.pdf>.

APPENDICES

Appendix A: Study Area Photographic Index and Noise Measurement Data

Appendix B: Noise Meter Print Outs

Appendix C: RCNM Construction Noise and FHWA Road Noise Calculations

APPENDIX A: STUDY AREA PHOTOGRAPHIC INDEX AND NOISE MEASUREMENT DATA

15-Minute Noise Measurement Datasheet

Project: 511 S. Oak Knoll Ave Project
Site Address/Location: 511 South Oak Knoll Avenue, Pasadena CA 91101
Date: 2/4/2025
Field Tech/Engineer: Ian Edward Gallagher
General Location: 511 South Oak Knoll Avenue, Pasadena CA 91101
Sound Meter: Larson Davis Sound Track LxT1 SN: 3099
Settings: A-weighted, slow, 10-sec, 15-minute interval
Meteorological Con.: 61 deg F, 5 mph wind, 57% humidity, 50% cloud, filtered sun.
Site ID: NM-1 thru 3

Site Observations:

Main noise sources are ground traffic & residential ambiance from human ground activity. Traffic noise from passing vehicles on S Oak Knoll Ave, El Molino Ave & E California Blvd. School N of site area, school yard ambiance. The bldgs reflect & refract much of the sound. Other noise sources include general city ambiance, bird song & pedestrians. Above, occasional propeller aircraft & helicopter passing overhead. Some leaf rustle from trees & vegetation due to 5 mph breeze.

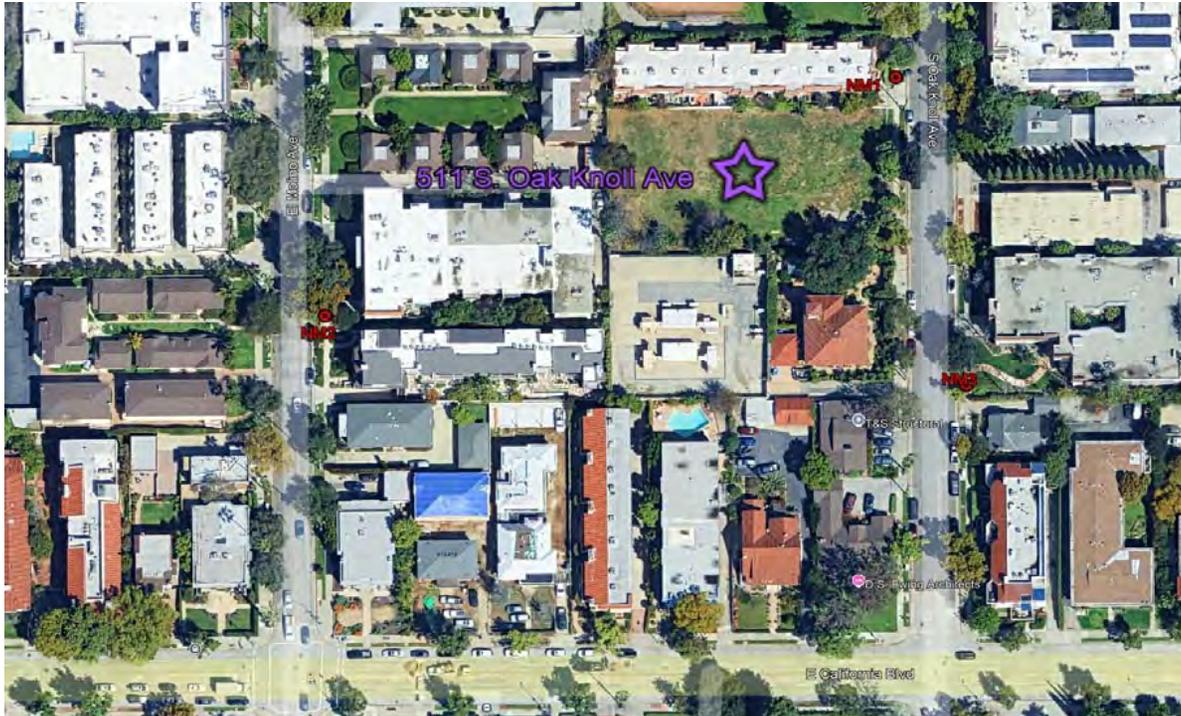
Site Topo: Urban, single & multifamily medium to high density residences

Ground Type: Urban like conditions, acoustically refractive, absorptive but mostly reflective off buildings and hard surfaces.

NM locations, latitude , longitude :

NM1 Meter: 34° 8'14.23"N 118° 8'6.88"W NM3 Meter: 34° 8'11.60"N 118° 8'6.22"W
 NM2 Meter: 34° 8'12.20"N 118° 8'12.24"W

Figure 1: Monitoring Locations



15-Minute Noise Measurement Datasheet - Cont.

Project: 511 S. Oak Knoll Ave Project
Site Address/Location: 511 South Oak Knoll Avenue, Pasadena CA 91101
Site ID: NM-1 thru 3

Figure 2: NM1 Photo



NM1 looking W at multifamily residence 501 S Oak Knoll Avenue, Pasadena.

Figure 3: NM2 Photo



NM2 looking SE towards multifamily residence 536 S El Molino Avenue, Pasadena.

15-Minute Noise Measurement Datasheet - Cont.

Project: 511 S. Oak Knoll Ave Project
Site Address/Location: 511 South Oak Knoll Avenue, Pasadena CA 91101
Site ID: NM-1 thru 3

Figure 4: NM3 Photo



NM3 looking E towards multifamily residence 534 S. Oak Knoll Avenue, Pasadena. 60Hz hum coming from nearby electrical transformer.

15-Minute Noise Measurement Datasheet - Cont.

Project: 511 S. Oak Knoll Ave Project
Site Address/Location: 511 South Oak Knoll Avenue, Pasadena CA 91101
Site ID: NM-1 thru 3

Table 1: Noise Measurement Summary

Location	Start	Stop	Leq/ dB	Lmax/ dB	Lmin/ dB	L2/ dB	L8/ dB	L25/ dB	L50/ dB	L90/ dB
NM1	1:37 PM	1:52 PM	62.9	74.7	40.7	70.8	68.5	63.9	55.5	43.8
NM2	2:08 PM	2:23 PM	61.1	71.3	44.2	68.0	66.2	62.4	56.5	50.8
NM3	2:37 PM	2:52 PM	62.3	84.0	42.9	68.9	65.8	60.7	54	48.0

APPENDIX B: NOISE METER PRINTOUTS

Measurement Report

Report Summary

Meter's File Name	LxT_Data.519.s	Computer's File Name	LxT_0003099-20250204 133703-LxT_Data.519.ldbin
Meter	LXT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM1 34° 8'14.23"N 118° 8'6.88"W
Job Description	15 minute noise measurement		
Note	KWAQN Project: 511 S Oak Knoll Avenue, Pasadena		
Start Time	2025-02-04 13:37:03	Duration	0:15:00.0
End Time	2025-02-04 13:52:03	Run Time	0:15:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA _{eq}	62.9 dB		
LAE	92.4 dB	SEA	--- dB
EA	194.8 μPa ² h	LAFTM5	67.8 dB
EA8	6.2 mPa ² h		
EA40	31.2 mPa ² h		
LA _{peak}	93.0 dB	2025-02-04 13:48:38	
LAS _{max}	74.7 dB	2025-02-04 13:45:15	
LAS _{min}	40.7 dB	2025-02-04 13:42:15	
LA _{eq}	62.9 dB		
LC _{eq}	69.3 dB	LC _{eq} - LA _{eq}	6.4 dB
LAI _{eq}	64.7 dB	LAI _{eq} - LA _{eq}	1.9 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	37	0:03:53.1
LAS > 85.0 dB	0	0:00:00.0
LA _{peak} > 135.0 dB	0	0:00:00.0
LA _{peak} > 137.0 dB	0	0:00:00.0
LA _{peak} > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB
	LDEN	LDay	LEve
	--- dB	--- dB	---
			LNight
			--- dB

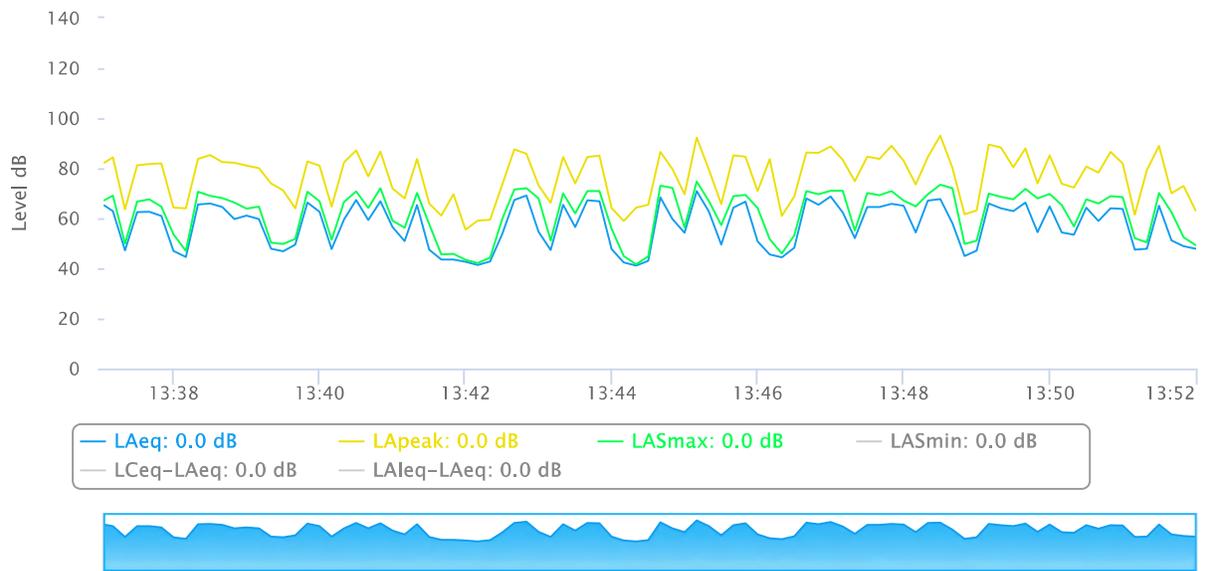
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	62.9 dB		69.3 dB		---	
LS _(max)	74.7 dB	2025-02-04 13:45:15	---		---	
LS _(min)	40.7 dB	2025-02-04 13:42:15	---		---	
L _{Peak(max)}	93.0 dB	2025-02-04 13:48:38	---		---	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

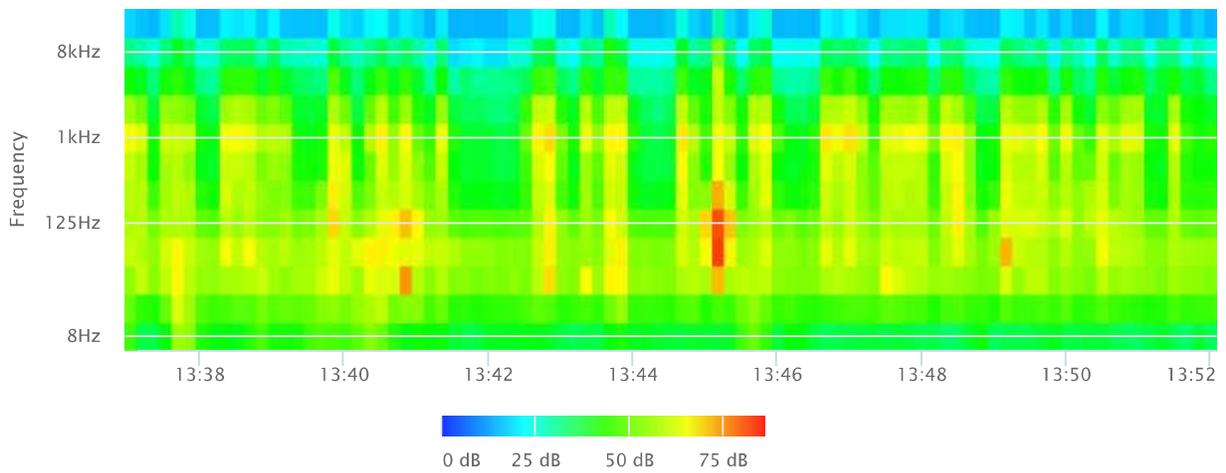
Statistics

LAS 2.0	70.8 dB
LAS 8.0	68.5 dB
LAS 25.0	63.9 dB
LAS 50.0	55.5 dB
LAS 66.6	50.2 dB
LAS 90.0	43.8 dB

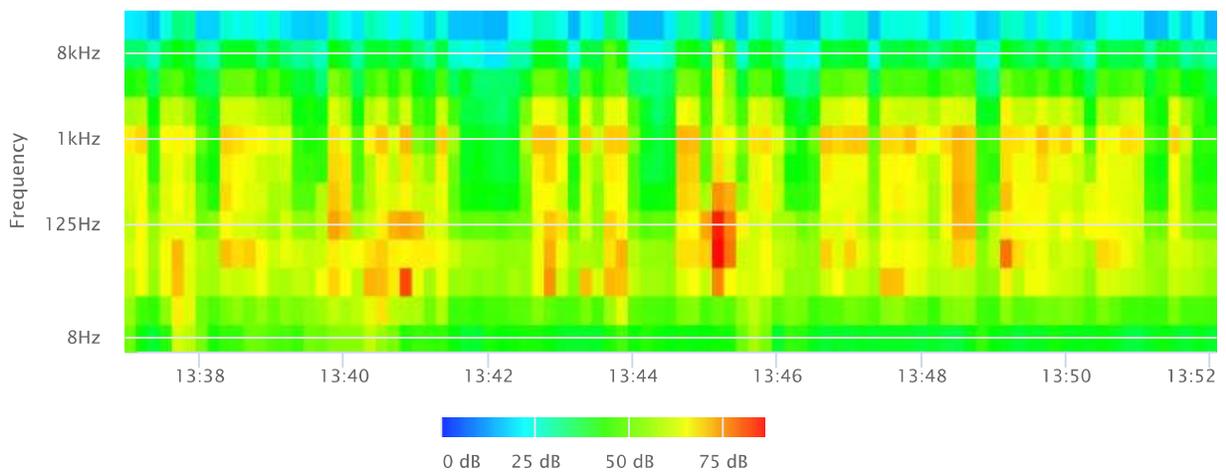
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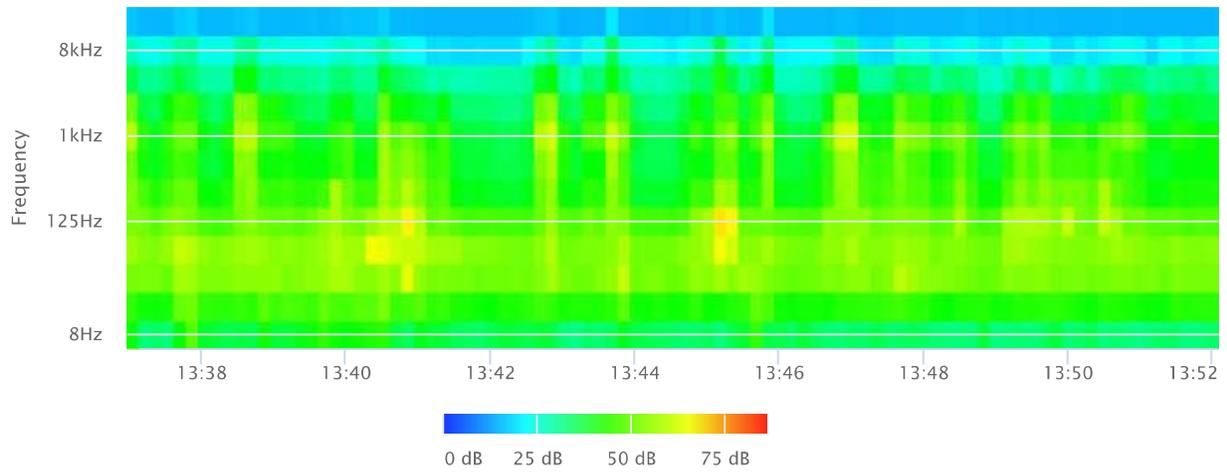
OBA 1/1 Leq



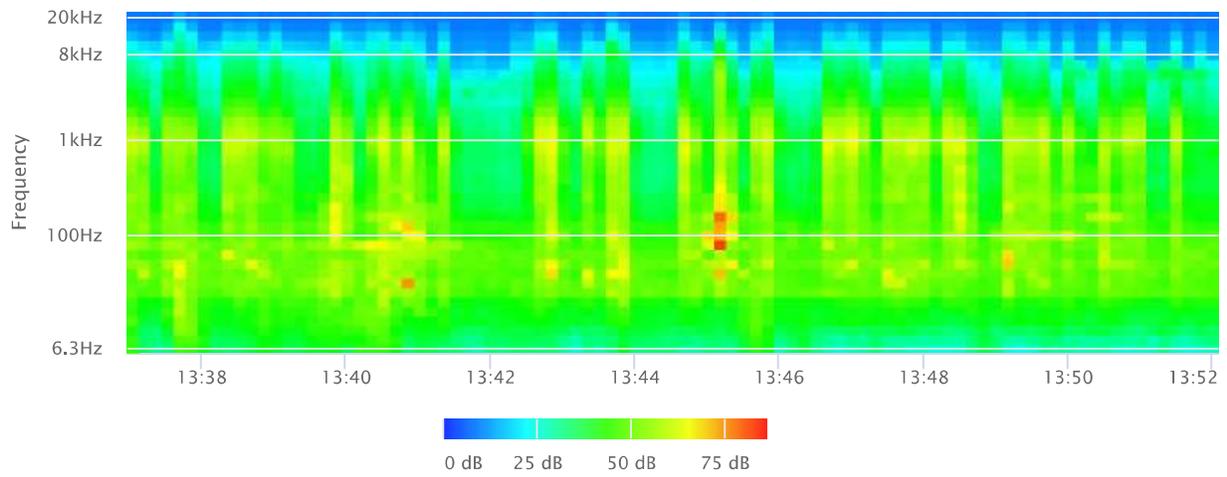
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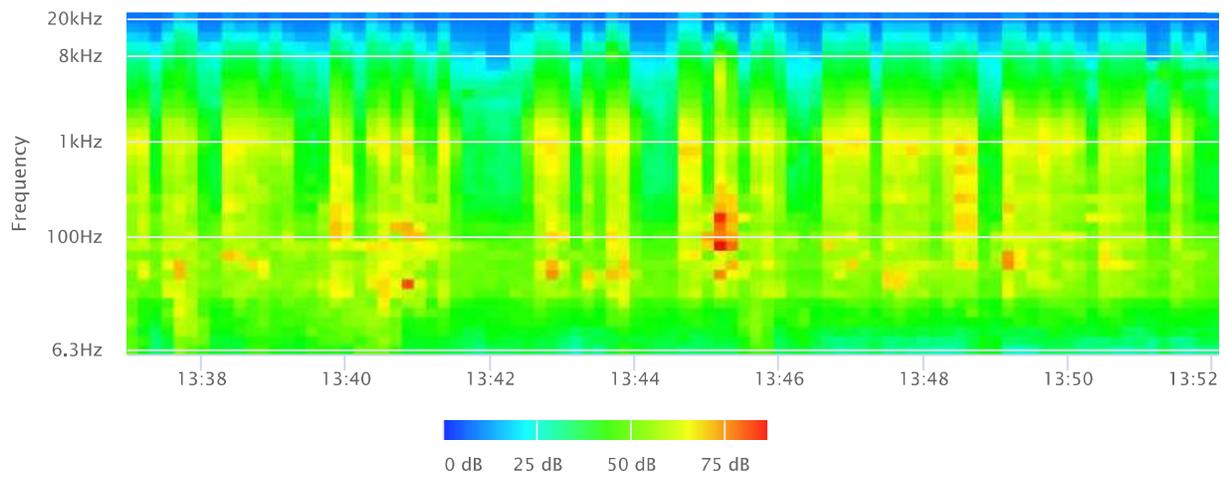
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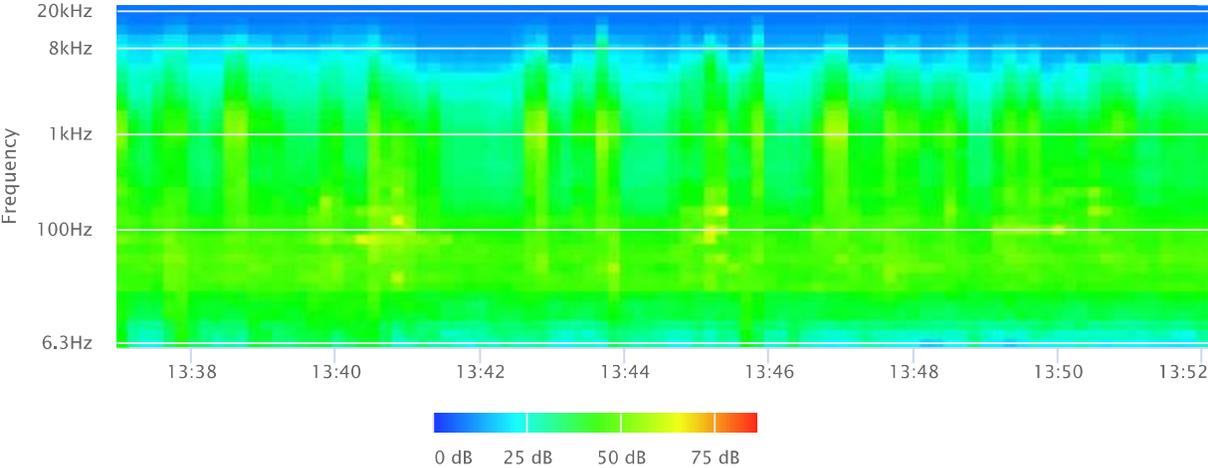
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



Measurement Report

Report Summary

Meter's File Name	LxT_Data.520.s	Computer's File Name	LxT_0003099-20250204 140829-LxT_Data.520.ldbin
Meter	LXT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM2 34° 8'12.20"N 118° 8'12.24"W
Job Description	15 minute noise measurement		
Note	KWAQN Project: 511 S Oak Knoll Avenue, Pasadena		
Start Time	2025-02-04 14:08:29	Duration	0:15:00.0
End Time	2025-02-04 14:23:29	Run Time	0:15:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA _{eq}	61.1 dB		
LAE	90.6 dB	SEA	--- dB
EA	128.1 μPa ² h	LAFTM5	65.9 dB
EA8	4.1 mPa ² h		
EA40	20.5 mPa ² h		
LA _{peak}	91.1 dB	2025-02-04 14:21:50	
LAS _{max}	71.3 dB	2025-02-04 14:10:47	
LAS _{min}	44.2 dB	2025-02-04 14:23:28	
LA _{eq}	61.1 dB		
LC _{eq}	70.0 dB	LC _{eq} - LA _{eq}	8.9 dB
LAI _{eq}	63.6 dB	LAI _{eq} - LA _{eq}	2.5 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	30	0:02:49.9
LAS > 85.0 dB	0	0:00:00.0
LA _{peak} > 135.0 dB	0	0:00:00.0
LA _{peak} > 137.0 dB	0	0:00:00.0
LA _{peak} > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A	C	Z
	Level	Level	Level
	Time Stamp	Time Stamp	Time Stamp
L _{eq}	61.1 dB	70.0 dB	--- dB
LS _(max)	71.3 dB	2025-02-04 14:10:47	--- dB
LS _(min)	44.2 dB	2025-02-04 14:23:28	--- dB
L _{Peak(max)}	91.1 dB	2025-02-04 14:21:50	--- dB

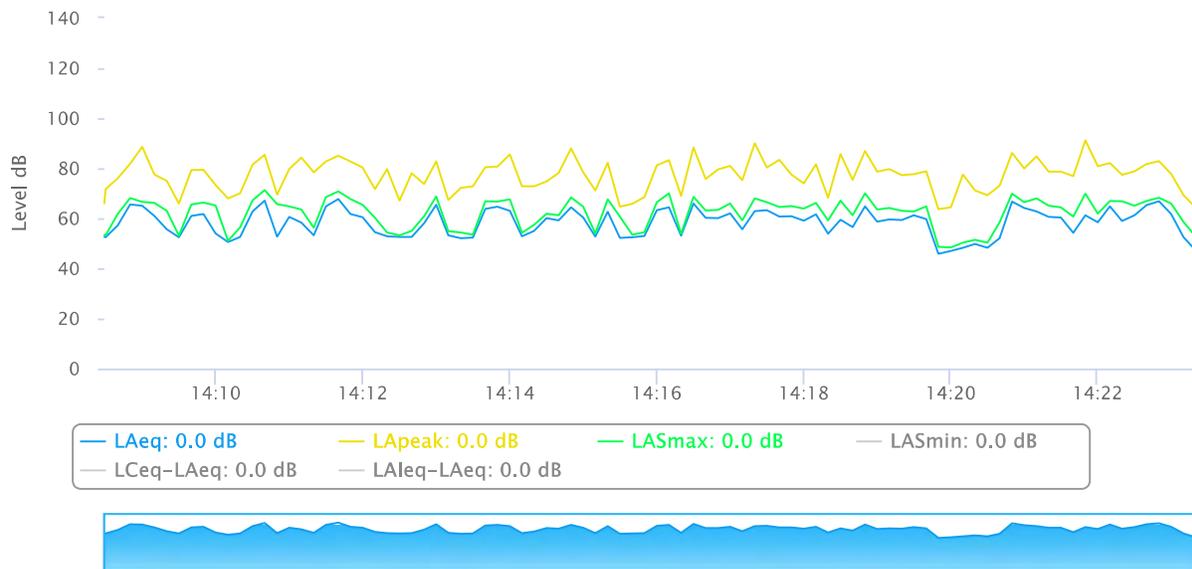
Overloads

Count	Duration	OBA Count	OBA Duration
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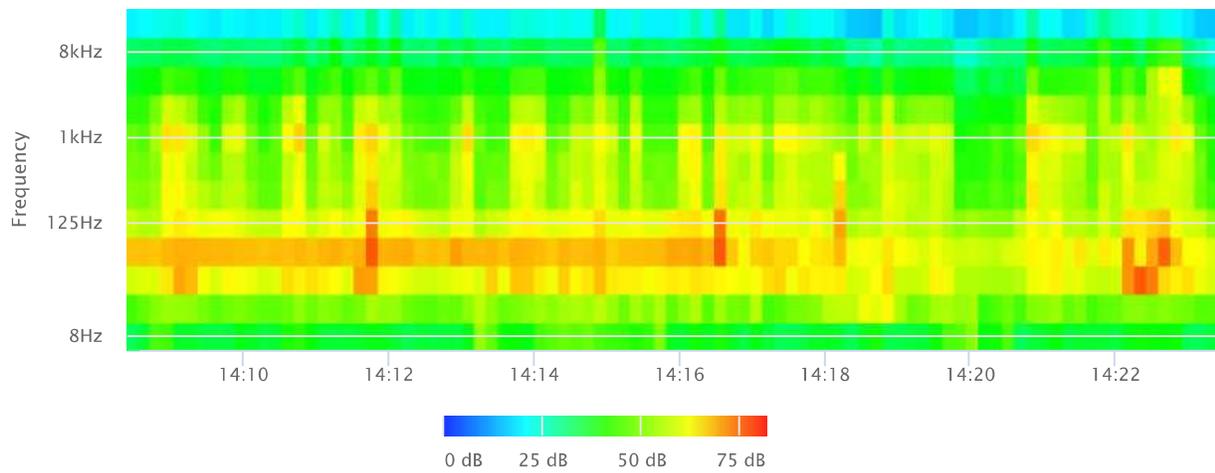
Statistics

LAS 2.0	68.0 dB
LAS 8.0	66.2 dB
LAS 25.0	62.4 dB
LAS 50.0	56.5 dB
LAS 66.6	53.4 dB
LAS 90.0	50.8 dB

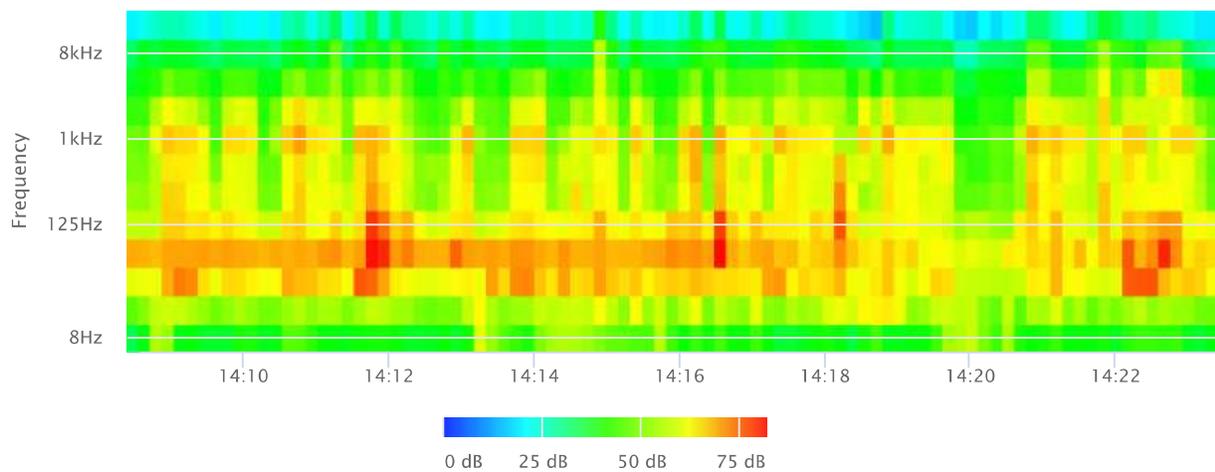
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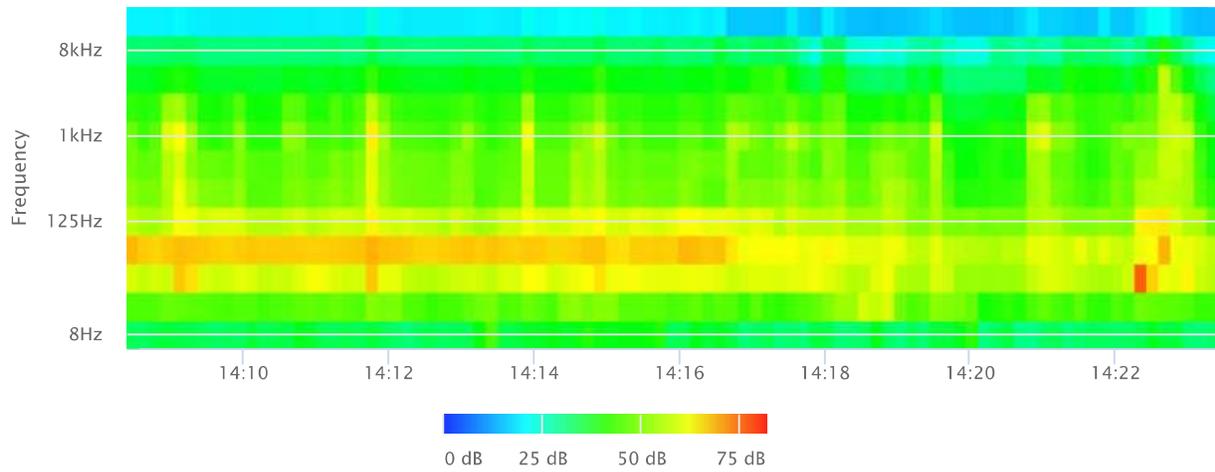
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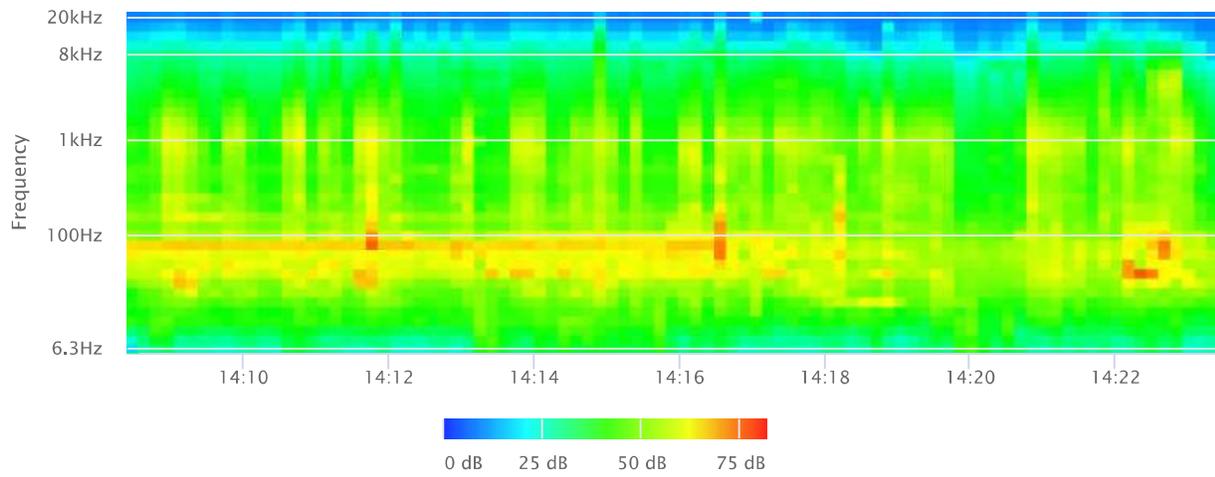
OBA 1/1 Lmax



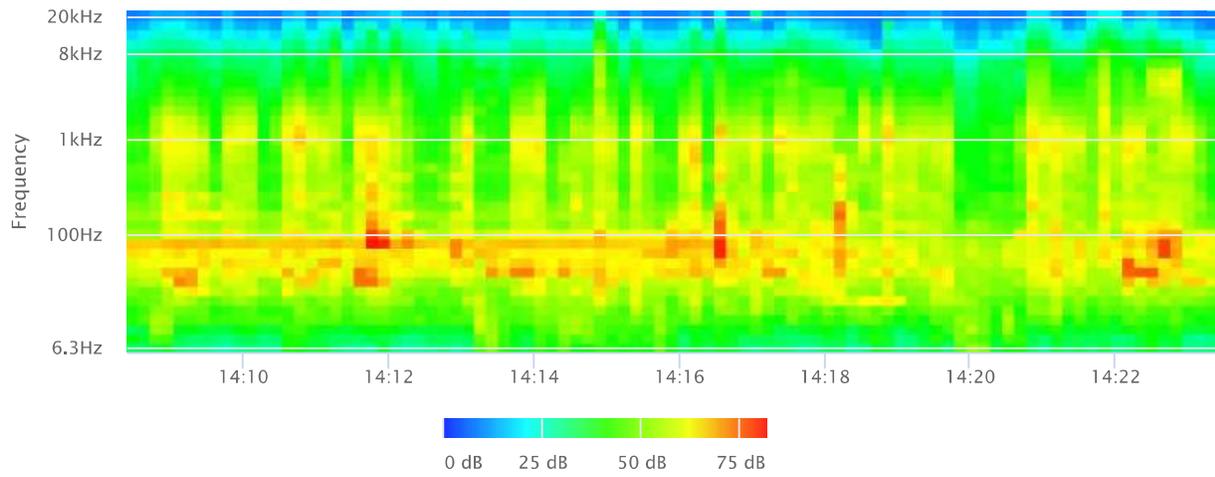
OBA 1/1 Lmin



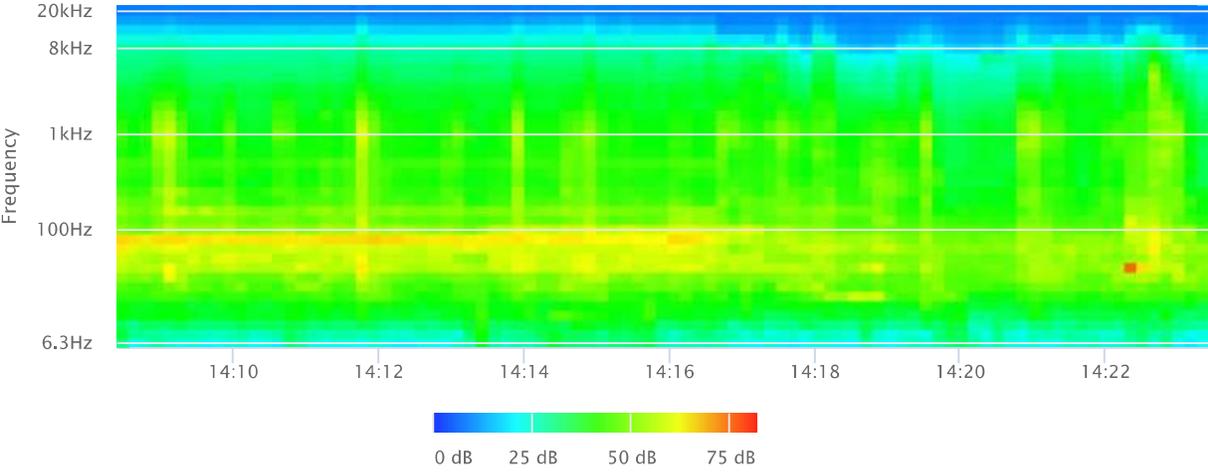
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



Measurement Report

Report Summary

Meter's File Name	LxT_Data.521.s	Computer's File Name	LxT_0003099-20250204 143742-LxT_Data.521.ldbin
Meter	LXT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM3 34° 8'11.60"N 118° 8'6.22"W
Job Description	15 minute noise measurement		
Note	KWAQN Project: 511 S Oak Knoll Avenue, Pasadena		
Start Time	2025-02-04 14:37:42	Duration	0:15:00.0
End Time	2025-02-04 14:52:42	Run Time	0:15:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA _{eq}	62.3 dB		
LAE	91.8 dB	SEA	--- dB
EA	167.9 μPa ² h	LAFTM5	67.8 dB
EA8	5.4 mPa ² h		
EA40	26.9 mPa ² h		
LA _{peak}	96.9 dB	2025-02-04 14:38:10	
LAS _{max}	84.0 dB	2025-02-04 14:38:11	
LAS _{min}	42.9 dB	2025-02-04 14:47:04	
LA _{eq}	62.3 dB		
LC _{eq}	68.4 dB	LC _{eq} - LA _{eq}	6.1 dB
LAI _{eq}	64.5 dB	LAI _{eq} - LA _{eq}	2.3 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	32	0:02:08.9
LAS > 85.0 dB	0	0:00:00.0
LA _{peak} > 135.0 dB	0	0:00:00.0
LA _{peak} > 137.0 dB	0	0:00:00.0
LA _{peak} > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
--- dB	--- dB	0.0 dB	
LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	62.3 dB		68.4 dB		--- dB	
LS _(max)	84.0 dB	2025-02-04 14:38:11	--- dB		--- dB	
LS _(min)	42.9 dB	2025-02-04 14:47:04	--- dB		--- dB	
L _{Peak(max)}	96.9 dB	2025-02-04 14:38:10	--- dB		--- dB	

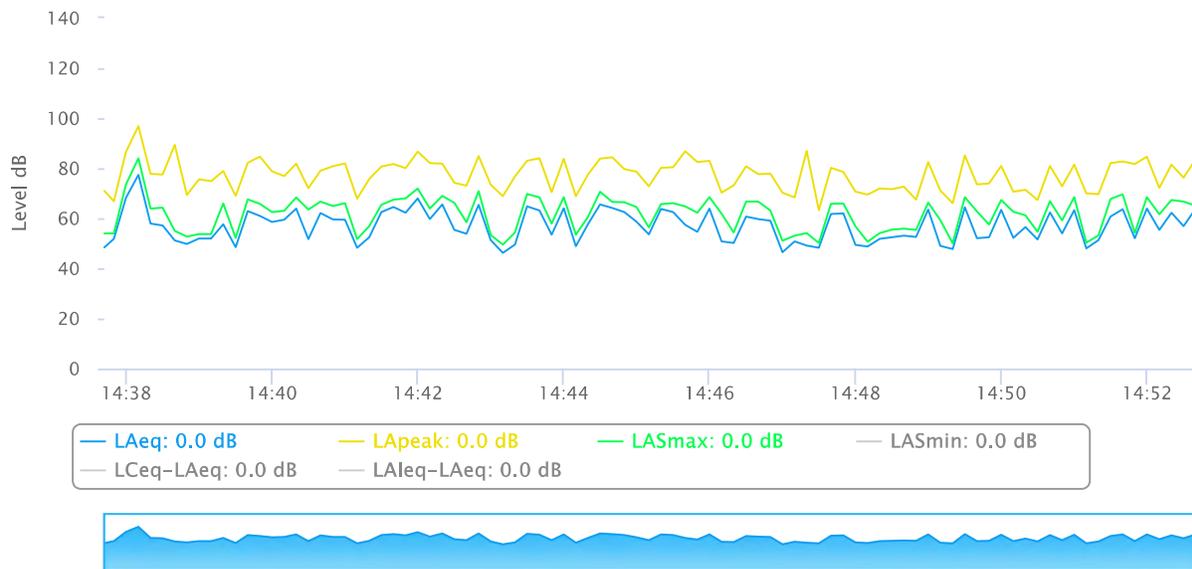
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

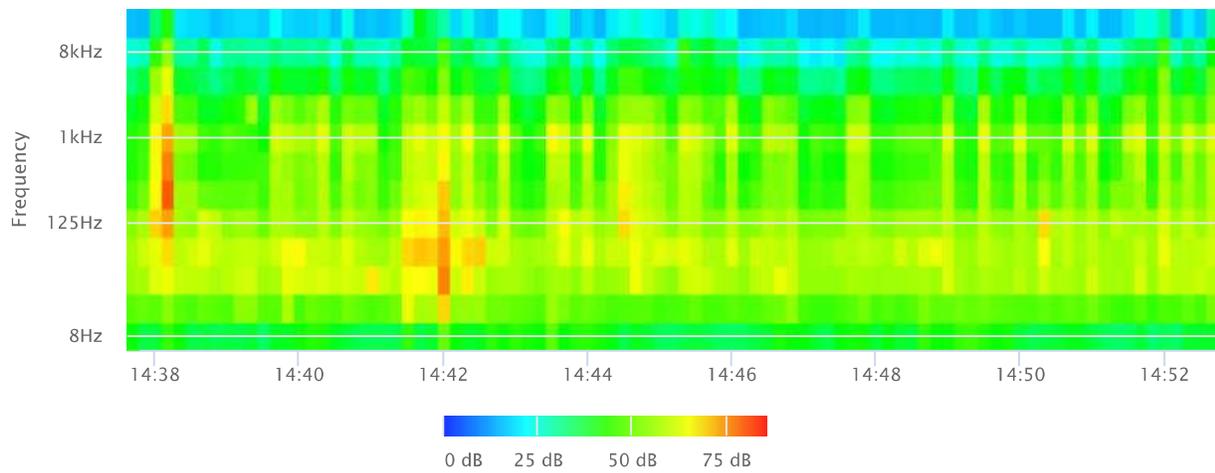
Statistics

LAS 2.0	68.9 dB
LAS 8.0	65.8 dB
LAS 25.0	60.7 dB
LAS 50.0	54.0 dB
LAS 66.6	51.5 dB
LAS 90.0	48.0 dB

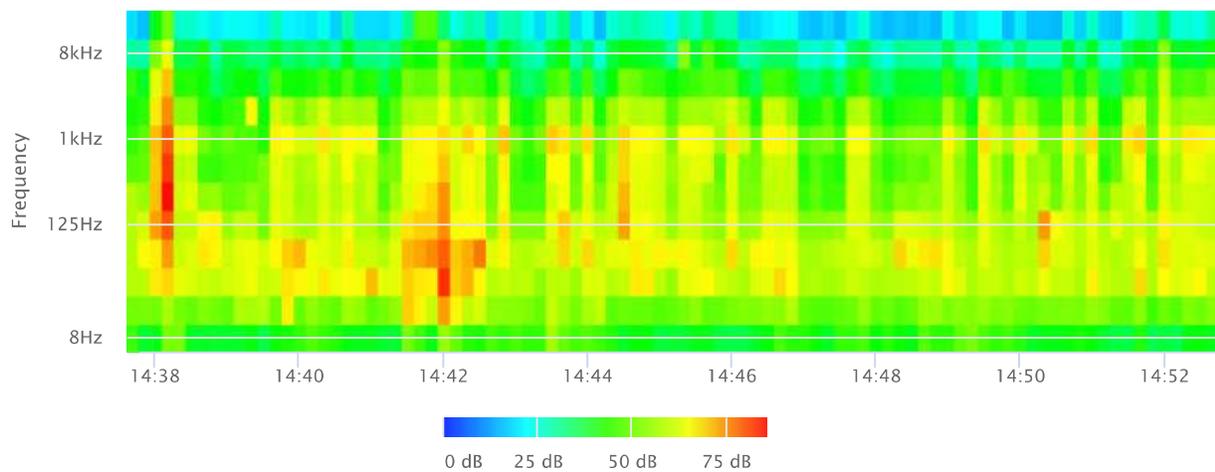
Time History



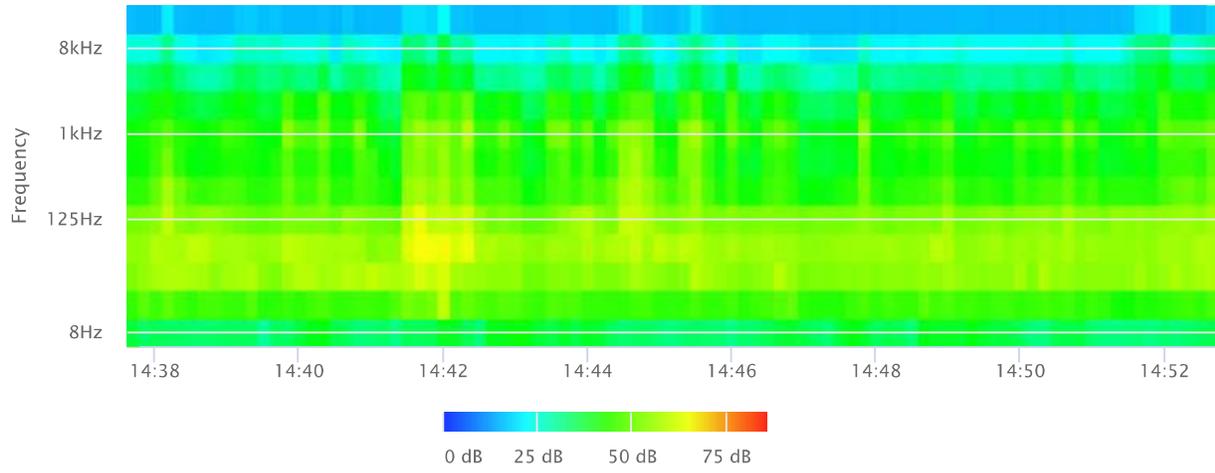
OBA 1/1 Leq



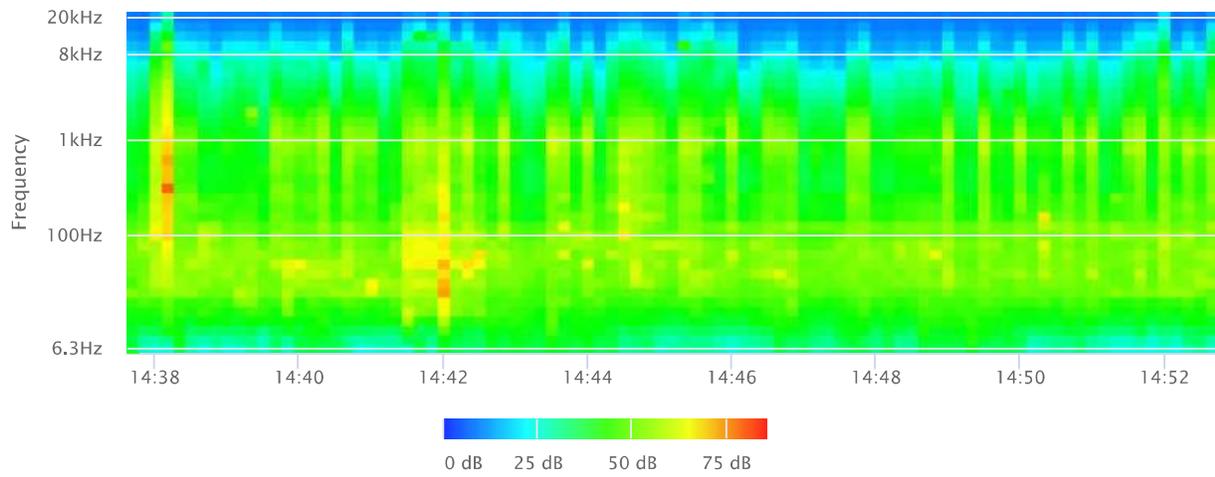
OBA 1/1 Lmax



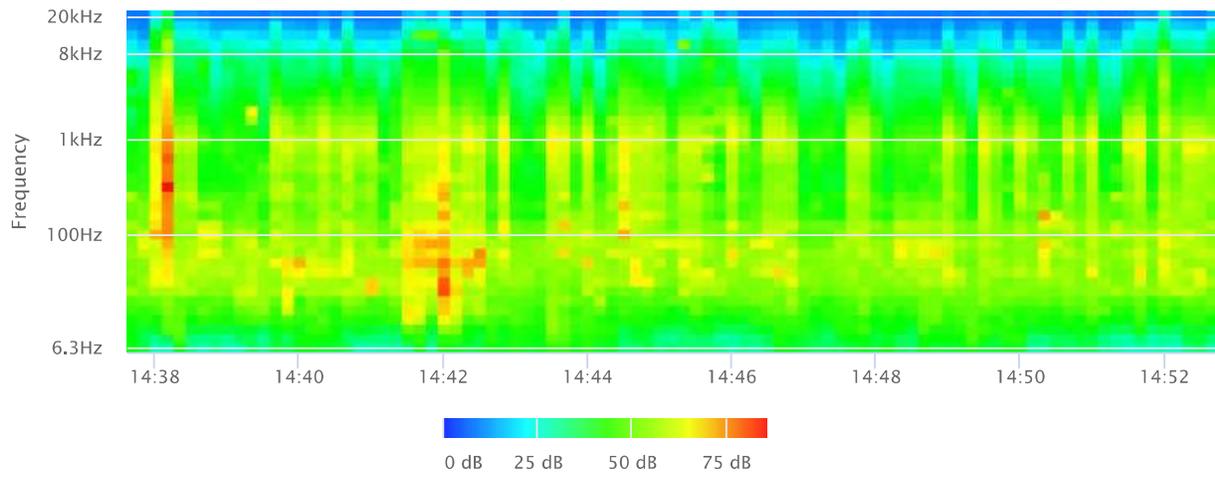
OBA 1/1 Lmin



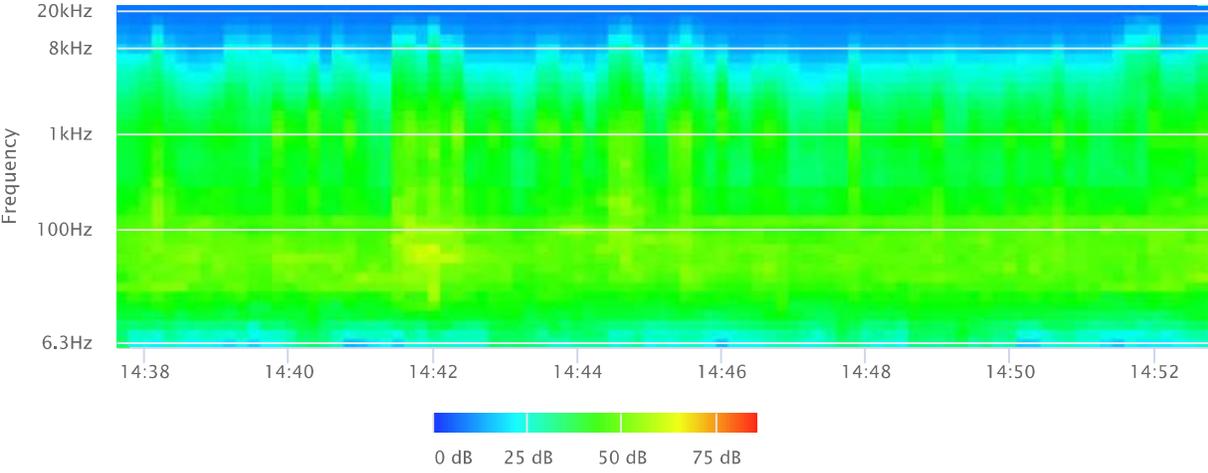
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



APPENDIX C: RCNM CONSTRUCTION AND FHWA ROAD NOISE CALCULATIONS

Table A
Construction Noise by Phase - 100 feet from Source

A	B	C	D	E	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA ^{1,2}	Distance to Receptor ³	Equipment Usage Percent	Noise Level Leq (dBA) at Receptor
Site Preparation					
Tractors/Loaders/Backhoes	1	79	100	40	69.0
					69.0
Excavation/Foundation					
Excavators	1	81	100	40	71.0
Rubber Tired Dozers	1	82	100	40	72.0
Tractors/Loaders/Backhoes	1	79	100	40	69.0
					75.6
Building Construction					
Cranes	1	81	100	16	67.0
Forklifts	2	58	100	50	52.0
Tractors/Loaders/Backhoes	2	79	100	40	72.0
Pumps	2	77	100	20	67.0
Cement and Mortar Mixers	1	79	100	40	69.0
					75.3
Architectural Coating					
Air Compressors	1	78	100	40	68.0
					68.0

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: Seixas, N. and Neitzel, R. (2004) "Noise exposure and hearing protection device use among construction workers in Washington state," Univ. of Washington Dept. of Env. and Occup. Health Sciences Rept., accessed Sept 10 2005 at http://staff.washington.edu/rneitzel/Noise_HPD.pdf

GROUNDBORNE VIBRATION ANALYSIS

Project: 505-511 S. Oak Knoll Date: 5/1/25
Source: Bulldozer
Scenario: Unmitigated
Location: Project Site
Address: Residential uses adjacent to northern and western boundaries
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.089 Reference PPV (in/sec) at 25 ft.
D = 15.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.191 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 500 S. El Molino Date: 5/1/25
Source: Large Bulldozer
Scenario: Unmitigated
Location: Project Site
Address: Historical residential use adjacent to western boundary and electrical substation to the south
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.089 Reference PPV (in/sec) at 25 ft.
D = 1.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 11.125 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 505-511 S. Oak Knoll Date: 5/1/25
Source: Large Bulldozer
Scenario: Unmitigated
Location: Project Site
Address: Historical residential use adjacent to southern boundary
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.089 Reference PPV (in/sec) at 25 ft.
D = 25.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.089 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 500 S. El Molino Date: 5/1/25
Source: Large Bulldozer
Scenario: Mitigated
Location: Project Site
Address: Historical residential use adjacent to western boundary
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.089 Reference PPV (in/sec) at 25 ft.
D = 21.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.116 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 500 S. El Molino Date: 5/1/25
Source: Large Bulldozer
Scenario: Mitigated
Location: Project Site
Address: Electrical substation to the south
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.089 Reference PPV (in/sec) at 25 ft.
D = 8.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.492 IN/SEC OUTPUT IN BLUE

Table B					
Noise Levels 50 feet from Roadway Centerline*					
Road Segments	Existing		Existing Plus Project		
	ADT	dB CNEL	ADT	Total	Project-Specific Increase
El Molino Avenue					
n/o Del Mar Blvd	2,860	62.3	2,870	62.3	0.0
s/o Del Mar Blvd	5,060	64.7	5,060	64.7	0.0
n/o California Blvd	3,060	62.6	3,060	62.6	0.0
s/o California Blvd	4,090	63.8	4,090	63.8	0.0
Oak Knoll Avenue					
n/o Del Mar Blvd	570	55.3	580	55.3	0.0
s/o Del Mar Blvd	1,340	59.0	1,420	59.2	0.2
Lake Avenue					
n/o Del Mar Blvd	7,060	66.2	7,080	66.2	0.0
s/o Del Mar Blvd	8,890	67.2	8,890	67.2	0.0
n/o California Blvd	5,550	65.1	5,550	65.1	0.0
s/o California Blvd	7,010	66.2	7,010	66.2	0.0
Del Mar Boulevard					
w/o El Molino Ave	10,130	67.8	10,150	67.8	0.0
e/o El Molino Ave	9,620	67.5	9,660	67.5	0.0
w/o Oak Knoll Ave	11,120	68.2	11,140	68.2	0.0
e/o Oak Knoll Ave	9,930	67.7	9,960	67.7	0.0
w/o Lake Ave	8,740	67.1	8,790	67.1	0.0
e/o Lake Ave	10,500	67.9	10,510	67.9	0.0
California Boulevard					
w/o El Molino Ave	7,950	66.7	7,970	66.7	0.0
e/o El Molino Ave	9,470	67.5	9,490	67.5	0.0
w/o Lake Ave	9,610	67.5	9,630	67.5	0.0
e/o Lake Ave	7,180	66.3	7,190	66.3	0.0
*The uniform distance of 50 feet allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies					