

AIR QUALITY IMPACT ANALYSIS

**NORTHGATE WALK PROJECT
CITY OF SAN RAFAEL, CALIFORNIA**

LSA

May 2018

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NORTHGATE WALK PROJECT CITY OF SAN RAFAEL, CALIFORNIA

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EXECUTIVE SUMMARY

LSA was retained to prepare an Air Quality Impact Analysis (AQIA) evaluating potential air quality and greenhouse gas (GHG) impacts for the proposed Northgate Walk Project (proposed project) located at 1005 and 1010 Northgate Drive in the City of San Rafael (City) in the County of Marin.

This AQIA provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The report provides data on existing air quality and evaluates potential air quality and GHG impacts associated with the proposed specific plan. This evaluation was prepared in conformance with appropriate standards, utilizing procedures and methodologies in the BAAQMD *CEQA Air Quality Guidelines*.¹ Air quality data posted on the respective websites of the California Air Resources Board (ARB) and the United States Environmental Protection Agency (EPA) are included to document the local air quality environment.

Emissions with regional effects during project construction, calculated with the California Emission Estimator Model (CalEEMod; Version 2016.3.2), would not exceed criteria pollutant thresholds established by the Bay Area Air Quality Management District (BAAQMD). Compliance with the Basic Construction Mitigation Measures required by the BAAQMD for all projects during construction would reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. With implementation of the Basic Construction Mitigation Measures, construction dust impacts would be reduced to a less-than-significant level.

Pollutant emissions from project operation were calculated using CalEEMod. The results of the CalEEMod analysis indicate the project would not exceed the significance criteria for daily or annual ROG, NO₂, PM₁₀ or PM_{2.5} emissions; therefore, the proposed project would not have a significant effect on regional air quality and mitigation would not be required. In addition, existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either State of California (State) or federal ambient air quality standards. The proposed project would not result in any significant impact in CO concentrations at intersections in the project vicinity.

In addition, a health risk assessment (HRA) was conducted to consider site-specific meteorological conditions and the proximity of the project site to the adjacent freeway and to determine the potential inhalation health risk to future residents from particulate matter, generated from the diesel vehicles and trucks on the adjacent freeway. The HRA results estimate a risk that would not exceed the BAAQMD criteria for mobile or stationary sources and therefore, future residents of the project site would not be exposed to substantial diesel particulate concentrations that would cause harmful effects. Health risk associated with the location of new sensitive receptors on the project site would be less than significant.

This AQIA also discusses the project's impacts related to the release of GHG emissions for both construction and project operation. Using CalEEMod, it was determined that the proposed project would not exceed any GHG emissions thresholds or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

¹ Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

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LIST OF ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AADT	annual average daily traffic
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
ARB	California Air Resources Board
ARB Handbook	California Air Resources Board Air Quality and Land Use Handbook
ASF	age sensitivity factor
AQIA	Air Quality Impact Analysis
BAAQMD	Bay Area Air Quality Management District
C_2F_6	hexafluoromethane
CAAQS	California Ambient Air Quality Standards
Cal Recycle	California Department of Resources, Recycling and Recovery
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAP	Clean Air Plan
CAT	Climate Action Team
CCAP	Climate Change Action Plan
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF_6	tetrafluoromethane
CH_4	methane
City	City of San Rafael
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
DPM	diesel particulate matter
EO	executive order
EV	electric vehicle
GDF	gasoline dispensing facility

GHGs	greenhouse gases
GWP	global warming potential
HFCs	hydrofluorocarbons
HRA	health risk assessment
IC	internal combustion
kWh	kilowatt hours
LEED	Leadership in Energy and Environmental Design
LOS	level of service
LSA	LSA Associates, Inc.
LUMs	Land Use and Local Impacts Measures
MMT	million metric tons
N/D	no data
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NHTSA	National Highway Traffic Safety Administration
O ₃	ozone
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PFCs	perfluorocarbons
PM	particulate matter
ppb	parts per billion
ppm	parts per million
ROG	reactive organic gases
REL	reference exposure level
SB	Senate Bill
SF ₆	sulfur hexafluoride
SMART	Sonoma-Marín Area Rapid Transit
SO ₂	sulfur dioxide
TAC	toxic air contaminant
USEPA	United States Environmental Protection Agency
VMT	vehicle miles traveled

INTRODUCTION

LSA Associates, Inc. (LSA) has completed an Air Quality Impact Analysis (AQIA) for the proposed Northgate Walk Project (proposed project) located at 1005 and 1010 Northgate Drive in the City of San Rafael (City) in the County of Marin.

This AQIA has been prepared using methods and assumptions recommended in the *CEQA Air Quality Guidelines* of the Bay Area Air Quality Management District (BAAQMD).² In keeping with these guidelines, this analysis describes existing air quality, potential impacts generated by the project on local carbon monoxide levels, emissions generated from project-related sources, and regional air pollution. An air quality emission analysis was conducted using the California Emissions Estimator Model (CalEEMod) to assess the potential air quality emissions associated with construction and operation of the project.

In accordance to the City of San Rafael General Plan Policy AW-2, Land Use Compatibility, the AQIA also includes a screening level analysis of toxic air contaminant (TAC) emissions from stationary source land uses in the vicinity of the project site using the analytical tools provided by the BAAQMD. A health risk assessment (HRA) was conducted to consider site-specific meteorological conditions and the proximity of the project site to the adjacent freeway and to determine the potential inhalation health risk to future residents from particulate matter, generated from the diesel vehicles and trucks on the adjacent freeway.

PROJECT DESCRIPTION

The proposed project is a residential infill project that would provide a mix of market-rate, senior, and low income housing. The proposed project is located near a variety of walkable amenities, including public transit stops and bikeways. The proposed project consists of three multi-family residential buildings adjacent to an existing hotel and office buildings, and utilizes previously developed or disturbed portions of the site. The proposed project includes two parcels: APN 178-240-17 (1005 Northgate Drive) and APN 178-240-21 (1010 Northgate Drive). As part of the project, the 1010 Northgate Drive parcel would be subdivided into three new parcels: 1010 Northgate Drive, 1020 Northgate Drive, and 1030 Northgate Drive. The project would also change the address 1005 Northgate Drive to 1007 Northgate Drive.

The 1007 Northgate Drive parcel would include the demolition of the existing commercial building and service station to construct a new 4-story, 30-unit, 50,573 square feet senior condominium building, and 6 of the units would be affordable. The 1010 Northgate Drive parcel would include the preservation of the existing hotel and a portion of the surface parking area for the hotel. The remaining structures, parking spaces, and landscaping would be demolished in order to develop 1020 and 1030 Northgate Drive. The proposed 1020 Northgate Drive lot would include the development of a 3-story, 48-unit, 146,693 square foot condominium building and an amenity building for the existing hotel. The proposed 2020 Northgate Drive would include 55,518 square feet of below-grade parking. The proposed 1030 Northgate Drive lot would be developed with a 3-story,

² Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

58-unit, 173,343 square foot building. The proposed 1030 Northgate Drive lot would include 106,960 square feet of below-grade parking.

Each residential building would include a subterranean parking garage, with a total of 367 parking spaces.

As discussed above, the proposed project is near shopping, transit, and major employers. The proposed project would include pathways that would give residents and hotel guests direct access to these nearby services via walking or bicycling. In addition, the proposed project would include a greenway buffer between the project, nearby concrete wash, and Highway 101. This buffer would contain a public pathway that provides access around the perimeter of the property. The proposed project would also incorporate “green” design elements, including:

- Leadership in Energy and Environmental Design (LEED) Silver certifiable design;
- Secure bike storage sites throughout the property;
- Shuttles to the nearby Sonoma-Marin Area Rapid Transit (SMART) train station;
- Dedicated car share spaces;
- Electric vehicle (EV) charging stations;
- Dedicated clean air vehicle spaces;
- Solar panels; and
- Water and power efficient landscaping and appliances.

A total of approximately 4,000 cubic yards of demolition and construction debris, including foundations, building materials, pavements, and utilities are anticipated to be recycled and off-hauled from the project site. Preliminary grading quantities include approximately 58,160 cubic yards of cut and 580 cubic yards of fill. The grading quantities are based on the difference between existing grade and finished grade. Final quantities will need to be adjusted to account for geotechnical conditions, trench spoils, foundation spoils, and surface conditions.

Demolition and construction activities are anticipated to begin in January 2019 and would occur over an approximately 15-month period. The proposed project is anticipated to be fully operational by mid-2020.

The approximate 7.81-acre project site is located within the Terra Linda neighborhood of the City. The project site is generally bounded to the north by existing residential development, to the east by Highway 101, to the south by the Freitas Parkway/Terra Linda freeway exit, and to the west by the Manuel T. Freitas Parkway. A segment of Las Gallinas Creek is located immediately north of the project site and separates the project site from the adjacent residential community.

The project site is located in a developed area of the City with the surrounding land uses including single- and medium-density residential, medium-to-high density residential, commercial office, and commercial shopping uses, including Northgate Mall. Land uses that are designated as large open spaces are located further east (approximately 0.9 miles) and to the northwest (approximately 0.8 miles) of the project site. A detailed vicinity map is shown in Figure 1.

AIR QUALITY BACKGROUND

This section provides background information on air pollutants and their health effects. It also provides brief information from the California Air Resources Board Air Quality and Land Use Handbook (ARB Handbook),³ a brief description of the general health risks of toxics, and the CEQA significance criteria for project evaluation.

Air Pollutants and Health Effects

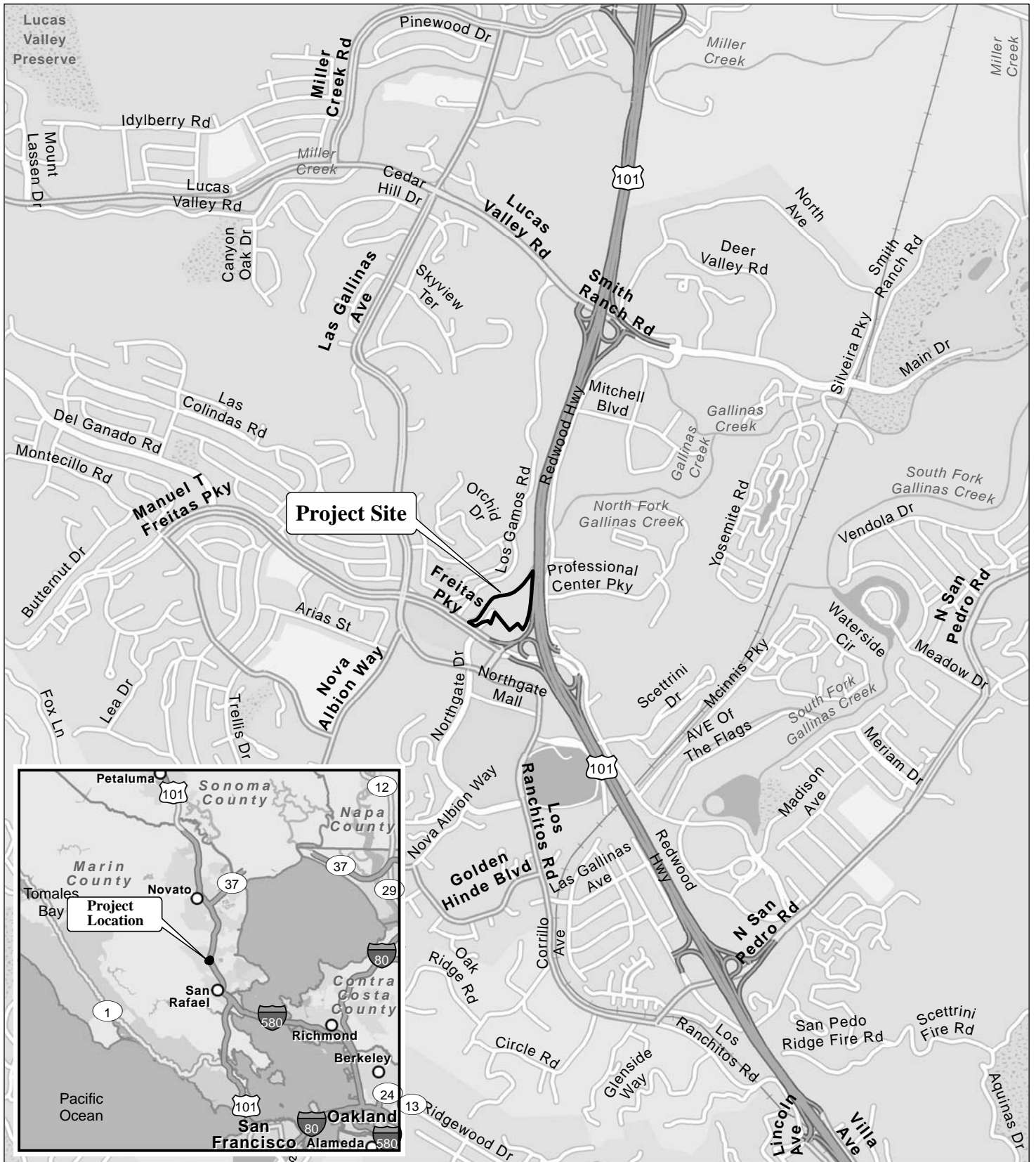
Both State and federal governments have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants:⁴ carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O₃ and NO₂, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO₂, and Pb are considered local pollutants that tend to accumulate in the air locally.

The primary pollutants of concern in the project area are O₃, CO, and PM. Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the Air Basin's projected attainment target goals for nonattainment criteria pollutants.

Because of the conservative nature of the significance thresholds, and the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic gases (ROG).

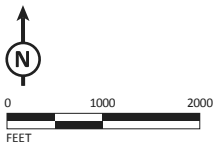
³ California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April.

⁴ Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.



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FIGURE 1



Occupants of facilities such as schools, day care centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

Ozone. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide. CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. While CO transport is limited, it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthy levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

Particulate Matter. Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is categorized in two size ranges: PM₁₀ for particles less than 10 microns in diameter and PM_{2.5} for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the California Air Resources Board (ARB), studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks, and studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function growth in children. The

ARB also reports that Statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.⁵

Nitrogen Dioxide. NO₂ is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO₂. Aside from its contribution to ozone formation, NO₂ also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO₂ may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO₂ decreases lung function and may reduce resistance to infection. On January 22, 2010, the United States Environmental Protection Agency (USEPA) strengthened the health-based National Ambient Air Quality Standards (NAAQS) for NO₂.

Sulfur Dioxide. SO₂ is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO₂ has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO₂ also reduces visibility and the level of sunlight at the ground surface.

Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the USEPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of USEPA regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants. In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the USEPA and ARB. In 1998, ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB has completed a risk management process that identified potential cancer risks for a range of activities

⁵ California Air Resources Board, 2011. *Fact Sheets*. October.

and land uses that are characterized by use of diesel fueled engines.⁶ High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

The BAAQMD regulates TACs using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, in order to provide a quantitative estimate of health risks.⁷ As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. Monitoring data and emissions inventories of TACs help the BAAQMD determine health risk to Bay Area residents.

Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for slightly over 50 percent of the average calculated cancer risk from ambient air in the Bay Area.⁸ According to the BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline. Due to this reduction, the calculated average cancer risk based on monitoring results has been reduced to 143 in 1,000,000; however, this risk does not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources - primarily "off-road" sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in urban parts of the Bay Area, while construction equipment typically operates for a limited time at various locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic.

Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined.⁹ The ARB Diesel Risk Reduction Plan is

⁶ California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

⁷ In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

⁸ Bay Area Air Quality Management District, 2015. *Toxic Air Contaminant Control Program Annual Report, Volume 1*. Website: www.baaqmd.gov/research-and-data/air-toxics/annual-report. May.

⁹ Ibid.

intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel - a step already implemented - and cleaner-burning diesel engines. The technology for reducing diesel particulate matter emissions from heavy-duty trucks is well established, and both State and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. ARB anticipates that by 2020 average Statewide diesel particulate matter concentrations will decrease by 85 percent from levels in 2000 with full implementation of the Diesel Risk Reduction Plan, meaning that the Statewide health risk from diesel particulate matter is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000. It is likely that the Bay Area cancer risk from diesel particulate matter will decrease by a similar factor by 2020.

Table A: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	<ul style="list-style-type: none"> • Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter. 	<ul style="list-style-type: none"> • Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO ₂)	<ul style="list-style-type: none"> • Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions. 	<ul style="list-style-type: none"> • Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O ₃)	<ul style="list-style-type: none"> • Atmospheric reaction of organic gases with nitrogen oxides in sunlight. 	<ul style="list-style-type: none"> • Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	<ul style="list-style-type: none"> • Contaminated soil. 	<ul style="list-style-type: none"> • Impairment of blood functions and nerve construction. • Behavioral and hearing problems in children.
Suspended Particulate Matter (PM _{2.5} and PM ₁₀)	<ul style="list-style-type: none"> • Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions. 	<ul style="list-style-type: none"> • Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO ₂)	<ul style="list-style-type: none"> • Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes. 	<ul style="list-style-type: none"> • Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2015.

Table B: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ^a		Federal Standards ^b		
		Concentration ^c	Method ^d	Primary ^{c,e}	Secondary ^{c,f}	Method ^g
Ozone (O ₃)	1-Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry		Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)		
Respirable Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³				
Fine Particulate Matter (PM _{2.5})	24-Hour		Gravimetric or Beta Attenuation	35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m ³		15 µg/m ³		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)		Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m ³)				
Nitrogen Dioxide (NO ₂) ^h	Annual Arithmetic Mean	0.03 ppm (57 µg/m ³)	Gas Phase Chemi-luminescence	0.053 ppb (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m ³)		100 ppb (188 µg/m ³)		
Lead (Pb) ^{i,k}	30-Day Average	1.5 µg/m ³	Atomic Absorption		Same as Primary Standard	High-Volume Sampler and Atomic Absorption
	Calendar Quarter			1.5 µg/m ³ (for certain areas) ^k		
	Rolling 3-Month Average ⁱ			0.15 µg/m ³		
Sulfur Dioxide (SO ₂) ⁱ	24-Hour	0.04 ppm (105 µg/m ³)	Ultraviolet Fluorescence	0.14 ppm (for certain areas) ⁱ	0.5 ppm (1300 µg/m ³)	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3-Hour					
	1-Hour	0.25 ppm (655 µg/m ³)		75 ppb (196 µg/m ³)		
	Annual Arithmetic Mean			0.030 ppm (for certain areas) ⁱ		
Visibility-Reducing Particles ^l	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m ³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence			
Vinyl Chloride ^j	24-Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography			

Table notes provided on the following page.

- ^a California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter (PM₁₀, PM_{2.5}, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- ^b National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.
- ^c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- ^d Any equivalent procedure which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
- ^e National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- ^f National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- ^g Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
- ^h To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb are identical to 0.100 ppm.
- ⁱ On June 2, 2010, a new 1-hour SO₂ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO₂ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standards to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
- ^j The ARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- ^k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
- ^l In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

°C = degrees Celsius

CARB = California Air Resources Board

EPA = United States Environmental Protection Agency

ppb = parts per billion

ppm = parts per million

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

Source: California Air Resources Board, 2015.

Greenhouse Gases and Global Climate Change

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose $0.6 \pm 0.2^\circ$ Celsius ($^\circ\text{C}$) or $1.1 \pm 0.4^\circ$ Fahrenheit ($^\circ\text{F}$) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other greenhouse gases (GHGs) are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.¹⁰

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2 , methane, and N_2O , some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this air quality analysis, the term "GHGs" will refer collectively to the six gases listed above only.

¹⁰ The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere (“atmospheric lifetime”). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO₂ over a specified time period. GHG emissions are typically measured in terms of pounds or tons of “CO₂ equivalents” (CO₂e). Table C shows the GWP for each type of GHG. For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

Table C: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF ₄)	50,000	7,390
PFC: Hexafluoromethane (C ₂ F ₆)	10,000	12,200
Sulfur Hexafluoride (SF ₆)	3,200	22,800

Source: IPCC, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.*

The following discussion summarizes the characteristics of the six GHGs.

Carbon Dioxide (CO₂). In the atmosphere, carbon generally exists in its oxidized form, as CO₂. Natural sources of CO₂ include the respiration (breathing) of humans, animals and plants, volcanic out gassing, decomposition of organic matter and evaporation from the oceans. Human caused sources of CO₂ include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO₂ each year, far outweighing the 7 billion tons of man-made emissions of CO₂ each year. Nevertheless, natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO₂, and consequently, the gas is building up in the atmosphere.

In 2002, CO₂ emissions from fossil fuel combustion accounted for approximately 98 percent of man-made CO₂ emissions and approximately 84 percent of California’s overall GHG emissions (CO₂e). The transportation sector accounted for California’s largest portion of CO₂ emissions, with gasoline consumption making up the greatest portion of these emissions. Electricity generation was California’s second largest category of GHG emissions.

Methane (CH₄). Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH₄ emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH₄ in California. Methane accounted for approximately 6 percent of gross climate change emissions (CO₂e) in California in 2002.

Total annual emissions of methane are approximately 500 million tons, with manmade emissions accounting for the majority. As with CO₂, the major removal process of atmospheric methane - a chemical breakdown in the atmosphere - cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

Nitrous Oxide (N₂O). Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N₂O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N₂O emissions in California. Nitrous oxide emissions accounted for nearly 7 percent of man-made GHG emissions (CO₂e) in California in 2002.

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF₆). HFCs are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.¹¹ PFCs and SF₆ are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semi-conductor industry leads to greater use of PFCs. HFCs, PFCs, and SF₆ accounted for about 3.5 percent of man-made GHG emissions in California in 2002.

Black Carbon. Black carbon is the most strongly light-absorbing component of PM formed by burning fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of PM_{2.5} and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in the atmosphere, black carbon can absorb a million times more energy than CO₂.¹² Black carbon contributes to climate change both directly, such as absorbing sunlight, and indirectly, such as affecting cloud formation. However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global-warming.

Most U.S. emissions of black carbon come from mobile sources (52 percent), especially diesel engines and vehicles. The other major source is open biomass burning, including wildfires, although

¹¹ The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

¹² United States Environmental Protection Agency. 2018. *Black Carbon*. Website: www3.epa.gov/blackcarbon/basic.html (accessed on May 11, 2018). May.

residential heating and industry also contribute. The ARB estimates that the annual black carbon emissions in California have decreased approximately 70 percent between 1990 and 2010 and are expected to continue to decline significantly due to controls on mobile diesel emissions.

Air Quality Regulatory Setting

The EPA and the California ARB regulate direct emissions from motor vehicles. The BAAQMD is the regional agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as monitoring ambient pollutant concentrations.

Federal Clean Air Act. The 1970 Federal Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

California Clean Air Act. In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards (CAAQS) for carbon monoxide, ozone, sulfur dioxide and nitrogen dioxide by the earliest practical date. The California Clean Air Act provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan (CAP) shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

California Air Resources Board Handbook. The California ARB has developed an Air Quality and Land Use Handbook,¹³ which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the ARB Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The ARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for “sensitive” land uses such as homes, medical facilities, daycare centers, schools and playgrounds.

Land use designations with air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners and large gasoline service

¹³ California Air Resources Board, 2005, *Air Quality and Land Use Handbook*, op. cit.

stations. Key recommendations in the ARB Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day.
- Within 1,000 feet of a major service and maintenance rail yard.
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries.
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet).
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The ARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site specific meteorology, freeway truck percentages or other factors that influence risk for a particular project site. The purpose of the land use compatibility analysis is to further examine the project site for actual health risk associated with the location of new housing on the project site, as required under the City's General Plan.

Bay Area Air Quality Management District. The BAAQMD has jurisdiction over most air quality matters in the San Francisco Bay Area Air Basin. The BAAQMD is tasked with implementing certain programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. The BAAQMD prepares plans to attain State and national ambient air quality standards.

The Clean Air Plan guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD 2017 Final Clean Air Plan is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter, and GHG emissions.

The BAAQMD Final 2017 Clean Air Plan, which was adopted on April 19, 2017, focuses on the following:

- The plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050;
- Updates the most recent Bay Area ozone plan, the *2010 Clean Air Plan* in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Provides a control strategy to reduce ozone precursors (ROG and NO_x), PM, TACs, and greenhouse gases in a single, integrated plan;

- Reviews progress in improving air quality in recent years; and
- Establishes emission control measures to be adopted or implemented in the 2017 to 2030 timeframe.

City of San Rafael General Plan. The City of San Rafael General Plan¹⁴ addresses air quality in the Air and Water Quality Element. Policies and programs work to provide clean air quality throughout the City and meet all ambient air quality standards. The following policies and programs from the Air and Water Quality Element specifically address air quality.

- Policy AW-1: State and Federal Standards. Continue to comply and strive to exceed state and federal standards for air quality for the benefit of the bay area.
 - Program AW-1a: Cooperation with Other Agencies. Cooperate with the BAAQMD and other agencies in their efforts to ensure compliance with existing air quality regulations.
- Policy AW-2: Land Use Compatibility. To ensure excellent air quality, promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where different land uses abut one another.
 - Program AW-2a: Sensitive Receptors. Through development review, ensure that siting of any new sensitive receptors provides for adequate buffers from existing sources of toxic air contaminants or odors. If development of a sensitive receptor (a facility or land use that includes members of the population sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses) is proposed within 500 feet of Highway 101 or I-580, an analysis of mobile source toxic air contaminant health risks should be performed. Development review should include an evaluation of the adequacy of the setback from the highway and, if necessary, identify design mitigation measures to reduce health risks to acceptable levels.
 - Program AW-2b: Buffers. Through development review, ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with existing health standards.
- Policy AW-4: Particulate Matter Pollution Reduction. Promote the reduction of particulate matter pollution from roads, parking lots, construction sites, agricultural lands, and other activities.
 - Program AW-4a: Pollution Reduction. Through development review, ensure that any proposed new sources of particulate matter use latest control technology (such as enclosures, paving unpaved areas, parking lot sweeping and landscaping) and provide adequate buffer setbacks to protect existing or future sensitive receptors.

¹⁴ San Rafael, City of, 2004. *The City of San Rafael General Plan 2020, Air and Water Quality Element.*

- Program AW-4b: Fireplaces and Woodburning Stoves. Cooperate with the local air quality district to monitor air pollution and enforce mitigations in areas affected by emissions from fireplaces and woodburning stoves. Encourage efficient use of home woodburning heating devices. Adopt and implement BAAQMD Model Woodsmoke Ordinance for new residential development.

Global Climate Change Regulation

This section describes regulations related to Global Climate Change at the Federal, State and local level.

Federal Regulations. The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the EPA has the authority to regulate CO₂ emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the EPA commenced several actions in 2009 to implement a regulatory approach to global climate change, including the ones described below.

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. In general, this national reporting requirement will provide the EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO₂ per year. This publicly-available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial GHGs, along with vehicle and engine manufacturers, will report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this rule.

On December 7, 2009, the EPA Administrator signed an endangerment finding action under the Clean Air Act, finding that six GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change. This EPA action does not impose any requirements on industry or other entities. However, the endangerment findings are a prerequisite to finalizing the GHG emission standards for light-duty vehicles mentioned below.

On April 1, 2010, the EPA and the Department of Transportation National Highway Traffic Safety Administration (NHTSA) announced a final joint rule to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. EPA has established the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA has adopted the Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act. The EPA GHG standards require light-duty vehicles to meet an estimated combined average emissions level of 250 grams of CO₂ per mile in model year 2016, equivalent to 35.5 miles per gallon. The EPA and the NHTSA also established standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses.

In May 2010, the USEPA sought to tailor existing regulations to accommodate GHG emissions for all stationary sources. However, the tailoring rule was challenged by several States, and the Supreme Court ruled on June 23, 2014 that the EPA cannot tailor an existing provision in the Clean Air Act. The Court ruled that the EPA may establish a de minimis threshold level for GHG (similar to the General Conformity Rule). On August 19, 2015, EPA published rule removing the tailoring provision vacated by the Court. EPA announced plans to proposed de minimis threshold for GHG in June 2016.

State Regulations. The ARB is the lead agency for implementing climate change regulations in the State. Since its formation, the ARB has worked with the public, the business sector, and local governments to find solutions to California’s air pollution problems. Key efforts by the State are described below.

Executive Order S-3-05 (2005). Governor Arnold Schwarzenegger signed Executive Order S-3-05 on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. The executive order declared that increased temperatures could reduce snowpack in the Sierra Nevada Mountains, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established California’s GHG emissions reduction targets, which established the following goals:

- GHG emissions should be reduced to 2000 levels by 2010;
- GHG emissions should be reduced to 1990 levels by 2020; and
- GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce GHGs. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California’s water supply, public health, agriculture, the coastline, and forestry, and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from State agencies as well as numerous other boards and departments. The CAT members work to coordinate Statewide efforts to implement global warming emission reduction programs and the State’s Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the Statewide GHG targets that were established in the executive order and further defined under Assembly Bill 32, the “Global Warming Solutions Act of 2006” (AB 32). The first CAT Report to the Governor and the Legislature was released in March 2006, which it laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The CAT Report to the Governor and Legislature and is updated periodically; the most recent was released in December 2010.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The ARB has established the level of GHG emissions in 1990 at 427 MMT CO₂e. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 requires the ARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures.¹⁵ The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The Scoping Plan, even after ARB approval, remains a recommendation. The measures in the Scoping Plan will not be binding until after they are adopted through the normal rulemaking process. The ARB rulemaking process includes preparation and release of each of the draft measures, public input through workshops, and a public comment period, followed by an ARB hearing and rule adoption.

In addition to reducing GHG emissions to 1990 levels by 2020, AB 32 directed the ARB and the newly created CAT to identify a list of "discrete early action GHG reduction measures" that could be adopted and made enforceable by January 1, 2010. On January 18, 2007, Governor Schwarzenegger signed Executive Order S-1-07, further solidifying California's dedication to reducing GHGs by setting a new Low Carbon Fuel Standard. The Executive Order sets a target to reduce the carbon intensity of California transportation fuels by at least 10 percent by 2020 and directs the ARB to consider the Low Carbon Fuel Standard as a discrete early action measure.

In June 2007, the ARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on GWP Refrigerants, and Landfill CH₄ Capture).¹⁶ Discrete early action measures are measures that were required to be adopted as regulations and made effective no later than January 1, 2010, the date established by Health and Safety Code Section 38560.5. The ARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures. These measures relate to truck efficiency, port electrification, reduction of PFCs from the semiconductor industry, reduction of propellants in consumer products, proper tire inflation, and SF₆ reductions from the non-electricity sector. The combination of early action measures is estimated to reduce State-wide GHG emissions by nearly 16 MMT.¹⁷

The ARB released the 2017 Climate Change Scoping Plan Update on January 20, 2017. This Scoping Plan Update establishes a proposed framework of action for California to meet the target of 40 percent reduction in GHGs by 2030 compared to 1990 levels. This goal builds on

¹⁵ California Air Resources Board, 2008. *Climate Change Scoping Plan: a framework for change*. December.

¹⁶ California Air Resources Board, 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. October.

¹⁷ California Air Resources Board, 2007. "ARB approves tripling of early action measures required under AB 32" News Release 07-46. Website: www.arb.ca.gov/newsrel/nr102507.htm. October 25.

California's success in establishing effective policies that have helped reduce emissions of GHGs while delivering substantial economic and environmental benefits. Further, the goal aligns California with the rest of the world in the global effort to fight climate change.

The first Scoping Plan was required by AB 32, the Global Warming Solutions Act, and was adopted in 2008. Under that plan, California set in place a range of effective programs to slash GHGs from cars, trucks, fuels, industry, and electrical generation, and the State is well on its way to achieving the goal of AB 32 to reach 1990 levels of GHGs by 2020. The 2017 Climate Change Scoping Plan Update builds on those programs and takes aim at the 2030 target established by SB 32 (Pavley). That bill, and related laws, is designed specifically to continue California's leadership in the fight against climate change and guide the State toward an equitable clean energy economy and prosperous future. To reach that future, the 2017 Climate Change Scoping Plan Update draws on the successes and the lessons learned from the first chapter of California's efforts to fight climate change under AB 32. The 2017 Climate Change Scoping Plan Update builds on key programs such as the Cap-and-Trade Regulation; the Low Carbon Fuel Standard; and much cleaner cars, trucks, and freight movement, powering the State off cleaner renewable energy, and strategies to reduce methane emissions from agricultural and other wastes by using methane to meet energy needs.

The ARB acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO₂e will be achieved associated with implementation of SB 375.

City of San Rafael General Plan. The City of San Rafael General Plan¹⁸ sets policies and programs addressing GHGs and climate change in the Sustainability Element. This Element serves as the City's guiding strategy to actively adapt to ongoing changes within the community and in the environment. It defines the City's goal of becoming a sustainable community by providing stewardship of shared natural resources, creating economic resilience, and contributing to the social well-being of its citizens. The following policies and programs are applicable to the proposed project.

- Policy SU-1: Land Use. Implement General Plan land use policies to increase residential and commercial densities within walking distance of high frequency transit centers and corridors.
 - Program SU-1a: Transportation Alternatives. Consider land use and transportation alternatives (better bicycle and pedestrian access and increased transit feeder service) to best use the future Civic Center SMART Station.
- Policy SU-7: New and Existing Trees. Plant new and retain existing trees to maximize energy conservation and carbon sequestration benefits.

¹⁸ San Rafael, City of, 2016. *The City of San Rafael General Plan 2020, Sustainability Element*. November.

- Program SU-7a: Tree Inventory. Inventory tree and vegetative cover to determine existing resources and carbon sequestration, and establish citywide goals and strategies to increase carbon sequestration.
- Program SU-7b: Tree Preservation. Adopt ordinances to regulate the removal and replacement of significant trees.
- Program SU-7c: Parking Lot Landscaping. Update zoning regulations for parking lot landscaping to increase shading and reduce thermal gain.
- Program SU-7d: Carbon Offset Program. Consider the feasibility of a local carbon offset program to support tree planting and maintenance.
- Policy SU-10: Zero Waste. Reduce material consumption and waste generation, increase resource re-use and composting of organic waste, and recycle to significantly reduce and ultimately eliminate landfill disposal.
 - Program SU-10a: Zero Waste. Adopt a Zero Waste Goal and a Zero Waste Strategic Plan to achieve this goal.
 - Program SU-10b: Home Composting. Develop a program to assist and educate residents in home-composting.
 - Program SU-10c: Community Composting. Create a community-scale composting program for food and green waste.
 - Program SU-10d: Organic Waste-to-Energy. Encourage the creation of an organic waste-to-energy program.
 - Program SU-10e: Incentives for Waste Reduction and Recycling. Work with the City's waste franchisee to create additional incentives in the rate structure for waste reduction and recycling and expand the range of recycled products if resale markets exist.
 - Program SU-10f: Construction Debris. Adopt construction debris and re-use ordinance.
 - Program SU-10g: Reuse Facilities. Assist in the development of additional reuse facilities (resale shops, refilling stations, repair shops and resource recovery yards).
 - Program SU-10h: Non-Recyclable Single Use Items. Investigate options for banning nonrecyclable single-use items, such as plastic bags and polystyrene takeout food containers.

City of San Rafael Climate Change Action Plan. The City of San Rafael Climate Change Action Plan (CCAP) was adopted in April 2009.¹⁹ The City is working to comply with State and federal regulations to reduce GHG emissions. Through the implementation of identified strategies, the CCAP seeks to

¹⁹ San Rafael, City of, 2009. *City of San Rafael Climate Change Action Plan*. April.

reduce GHG emissions and achieve a more sustainable society which utilizes and replenishes its resources on three levels: its environmental resources, its community resources, and its economy. The strategies included in the CCAP include:

- Lifestyle strategies including: compact, transit-oriented development; non-auto mobility; energy efficient vehicles; and waste reduction.
- Buildings strategies including: resource and energy conservation, renewable energy production, and water conservation.
- Environmental strategies including: urban forestry and local food production, habitat protection and restoration, and adaption to climate change.
- Economic strategies including: green businesses and social equity.

ENVIRONMENTAL SETTING

Attainment Status

The ARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA also designates areas as attainment, nonattainment, or classified. Table D provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

Table D: San Francisco Bay Area Attainment Status

	Averaging Time	California Standards ^a		National Standards ^b	
		Concentration	Attainment Status	Concentration ^c	Attainment Status
Ozone (O₃)	8-Hour	0.070 ppm (137 µg/m ³)	Nonattainment ^h	0.075 ppm	Nonattainment ^d
	1-Hour	0.09 ppm (180 µg/m ³)	Nonattainment	Not Applicable	Not Applicable ^e
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m ³)	Attainment	9 ppm (10 mg/m ³)	Attainment ^f
	1-Hour	20 ppm (23 mg/m ³)	Attainment	35 ppm (40 mg/m ³)	Attainment
Nitrogen Dioxide (NO₂)	1-Hour	0.18 ppm (339 µg/m ³)	Attainment	0.100 ppm	Unclassified ^j
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)		0.053 ppm (100 µg/m ³)	Attainment
Sulfur Dioxide^k (SO₂)	24-Hour	0.04 ppm (105 µg/m ³)	Attainment	0.14 ppm (365 µg/m ³)	Attainment ^k
	1-Hour	0.25 ppm (655 µg/m ³)	Attainment	0.075 ppm (196 µg/m ³)	Attainment ^k
	Annual Arithmetic Mean			0.030 ppm (80 µg/m ³)	Attainment ^k
Coarse Particulate Matter (PM₁₀)	Annual Arithmetic Mean	20 µg/m ³	Nonattainment ^g	Not Applicable	
	24-Hour	50 µg/m ³	Nonattainment	150 µg/m ³	Unclassified
Fine Particulate Matter (PM_{2.5})	Annual Arithmetic Mean	12 µg/m ³	Nonattainment ^g	15 µg/m ³	Attainment
	24-Hour			35 µg/m ³ ^l	Nonattainment

^a California standards for ozone, carbon monoxide (except in the Lake Tahoe air basin), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on average. The Lake Tahoe CO standard is 6.0 ppm, a level one-third the national standard and two-thirds the State standard.

^b National standards shown are the “primary standards” designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM₁₀ standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially-averaged across officially-designed clusters of sites falls below the standard.

^c National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.

^d On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. EPA will make recommendations on attainment designations by October 1, 2016, and issue final designations October 1, 2017. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.

Table notes continued on the following page.

- ^e The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.
- ^f In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
- ^g In June 2002, ARB established new annual standards for PM_{2.5} and PM₁₀.
- ^h The 8-hour California ozone standard was approved by the ARB on April 28, 2005 and became effective on May 17, 2006.
- ⁱ On January 9, 2013, USEPA issued a final rule to determine that the Bay Area attains the 24-hour PM_{2.5} national standard. This USEPA rule suspends key SIP requirement as long as monitoring data continues to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour PM_{2.5} standard until such time as the Air District submits a redesignation request and a maintenance plan to USEPA and USEPA approves the proposed redesignation.
- ^j To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010). The US Environmental Protection Agency (EPA) expects to make a designation for the Bay Area by the end of 2017.
- ^k On June 2, 2010, the USEPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO₂ NAAQS, however, must be used until one year following USEPA initial designations of the new 1-hour SO₂ NAAQS.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

Source: Bay Area Air Quality Management District. 2018.

Website: <http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status>, accessed May 2018.

Existing Climate and Air Quality

The City of San Rafael is located in the Marin County climate subregion in the San Francisco Bay Area. The proximity of the San Francisco Bay and Pacific Ocean has a moderating influence on the climate. The shallow San Francisco Air Basin is ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

Marin County is in the North Bay, which consists of Marin, Napa, Solano, and Sonoma Counties and is connected to San Francisco by the Golden Gate Bridge and to the East Bay by the Richmond – San Rafael Bridge and the Carquinez Bridge. The area is mostly hilly with most of the terrain between 800 to 1,000 feet high, which is often not high enough to block the marine layer. Marin County is subject to marine air flow. The further from the ocean the marine air travels, the more the ocean's effect is diminished.

The west coast and southern portions of Marin County are often subject to cool marine air and substantial fog. Temperatures in these areas remain steady through the year because of the nearby ocean. The eastern side of Marin County is warmer and has less fog, due in large part to its distance from the ocean. Prevailing winds throughout the county are generally from the northwest, with wind speeds highest along the west coast. Annual rainfall in the mountains is generally higher than in most parts of the Bay Area, averaging 37 to 49 inches. The majority of rainfall across the county occurs November through March. Air temperatures are moderated by the county's proximity to the Bay and to the sea breeze.²⁰

²⁰ Bay Area Air Quality Management District, 2016. *Climate in Marin County*. Website: www.baaqmd.gov/in-your-community/marin-county. April.

Along the Marin County coast and in southern Marin County, clean air from the Pacific Ocean helps to keep air pollution at a minimum. Elsewhere in Marin County, ozone only rarely becomes a concern, but the hilly terrain and colder winter temperatures can trap PM_{2.5} near the surface, resulting in air quality that exceeds health standards. However, despite these factors, air quality monitoring indicates that air quality in Marin County has generally been good.

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Ozone levels, measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the BAAQMD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health; however the Bay Area still exceeds the State standard for 1-hour ozone as well as the State and federal 8-hour standards. Levels of PM₁₀ have exceeded State standards two of the last three years, and the area is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM₁₀ standard.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

Air Quality Monitoring Results

Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the EPA to identify regions as "attainment" or "nonattainment" depending on whether the regions met the requirements stated in the primary NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

Pollutant monitoring results for the years 2015 to 2017 at the San Rafael ambient air quality monitoring station, shown in Table E, indicate that air quality in San Rafael has generally been good. As indicated in the monitoring results, no violation of the State and federal PM₁₀ standard occurred during the 3-year period. PM_{2.5} levels exceeded the federal standard twice in 2015, none in 2016,

Table E: Ambient Air Quality at the San Rafael Monitoring Station

Pollutant	Standard	2015	2016	2017
Carbon Monoxide (CO)				
Maximum 1-hour concentration (ppm)		1.4	1.4	2.6
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		0.9	1.0	1.6
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O₃)				
Maximum 1-hour concentration (ppm)		0.081	0.088	0.088
Number of days exceeded:	State: > 0.09 ppm	0	0	0
Maximum 8-hour concentration (ppm)		0.07	0.067	0.063
Number of days exceeded:	State: > 0.07 ppm	0	0	0
	Federal: > 0.08 ppm	0	0	0
Coarse Particulates (PM₁₀)				
Maximum 24-hour concentration (µg/m ³)		42.2	26.6	91
Number of days exceeded:	State: > 50 µg/m ³	0	0	N/D
	Federal: > 150 µg/m ³	0	0	0
Annual arithmetic average concentration (µg/m ³)		15.7	13.4	N/D
Exceeded for the year:	State: > 20 µg/m ³	No	No	N/D
	Federal: > 50 µg/m ³	No	No	N/D
Fine Particulates (PM_{2.5})				
Maximum 24-hour concentration (µg/m ³)		36.3	15.6	74.7
Number of days exceeded:	Federal: > 35 µg/m ³	2	0	N/D
Annual arithmetic average concentration (µg/m ³)		8.6	6.5	9.7
Exceeded for the year:	State: > 12 µg/m ³	No	No	No
	Federal: > 12 µg/m ³	No	No	No
Nitrogen Dioxide (NO₂)				
Maximum 1-hour concentration (ppm)		0.044	0.046	0.053
Number of days exceeded:	State: > 0.18 ppm	0	0	0
	Federal: > 100 ppb	0	0	0
Annual arithmetic average concentration (ppm)		0.011	.009	0.010
Exceeded for the year:	State: > 0.030 ppm	No	No	No
	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO₂)^a				
Maximum 1-hour concentration (ppm)		N/D	N/D	N/D
Number of days exceeded:	State: > 0.25 ppm	0	0	0
	Federal: > 75 ppb	0	0	0
Maximum 3-hour concentration (ppm)		N/D	N/D	N/D
Number of days exceeded:	Federal: > 0.50 ppm	0	0	0
Maximum 24-hour concentration (ppm)		N/D	N/D	N/D
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		N/D	N/D	N/D
Exceeded for the year:	Federal: > 0.030 ppm	N/D	N/D	N/D

Notes: Data from the 534 4th Street, San Rafael monitoring site.
Source: ARB and USEPA, 2018.
ppm = parts per million
ppb = parts per billion
µg/m³ = micrograms per cubic meter

N/D = No data. There was insufficient (or no) data to determine the value. There is no monitoring for SO₂ in the City of San Rafael.

and no data is currently present for 2017. The State 1-hour and 8-hour ozone standards, as well as the federal 8-hour standard, were not exceeded in the 3-year period. The CO and NO₂ standards were also not exceeded in this area during the 3-year period. SO₂ is not monitored in Marin County.

Greenhouse Gas Emissions Inventory

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, California, and local GHG emission inventories.

Global Emissions. Worldwide net emissions (including the effects of land use and forestry) of GHGs in 2010 were 46 billion metric tons²¹ of CO₂e per year.²² This represents a 35 percent increase from 1990.

United States Emissions. In 2014, the United States emitted approximately 6.9 million metric tons of CO₂e. The total 2012 CO₂e emissions represent a 7 percent increase since 1990, along with a 7 percent decrease since 2005. Of the six major sectors nationwide – residential, commercial, agricultural, industry, transportation, and electricity generation – transportation accounts for the highest amount of GHG emissions (approximately 28 percent), with electricity being a close second at also approximately 28 percent; these emissions are generated entirely from direct fossil fuel combustion.²³

State of California Emissions. The ARB is responsible for developing the California GHG Emission Inventory. This inventory estimates the amount of GHGs emitted to and removed from the atmosphere by human activities within the State and supports the AB 32 Climate Change Program.

According to ARB emission inventory estimates, the State emitted approximately 440.4 million metric tons of CO₂e (MMT CO₂e) emissions in 2015. This is a decrease of 1.5 MMT CO₂e since 2014 and a 10 percent decrease since 2004 (CARB 2016b).

The ARB estimates that transportation was the source of approximately 37 percent of the State's GHG emissions in 2015, followed by industrial sources at 21 percent and electricity generation (both in State and out of State) at 19 percent. The remaining sources of GHG emissions were residential and commercial activities at 9 percent, agriculture at 8 percent, high-GWP gases at 4 percent, and recycling and waste at 2 percent (CARB 2016b).

California GHG emissions from the transportation sector—still the State's largest single source of GHGs, contributing 37 percent of total emissions—was relatively constant through 2007, declined

²¹ A metric ton is equivalent to approximately 1.1 tons.

²² United States Environmental Protection Agency, 2014. *Climate Change Indicators in the United States: Global Greenhouse Gas Emissions*. Website: www.epa.gov/climatechange/science/indicators/ghg/global-ghg-emissions.html.

²³ Ibid.

through 2013, and has increased slightly over the past few years. On-road GHGs, primarily from fuel use, account for 99 percent of the increase. Regulations and improved fuel efficiency of the State's vehicle fleet would result in a reduction of emissions over time; however, population growth, lower fuel prices, and improved economic conditions contribute to increased fuel use, resulting in GHG emissions.²⁴

San Francisco Bay Area Emissions. The BAAQMD established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The BAAQMD regularly prepares inventories of criteria and toxic air pollutants to support planning, regulatory and other programs. The most recent emissions inventory estimates GHG emissions produced by the San Francisco Bay Area in 2011.²⁵ The inventory, which was published January 2015, updates the previous BAAQMD GHG emission inventory for base year 2007.

In 2011, 86.6 million metric tons of CO₂e of GHGs were emitted by the San Francisco Bay Area. Fossil fuel consumption in the transportation sector was the single largest source of the San Francisco Bay Area's GHG emissions in 2011. The transportation sector (including on-road motor vehicles, locomotives, ships and boats, and aircraft) contributed 39.7 percent of GHG emissions and the industrial and commercial sectors (excluding electricity and agriculture) contributed 35.7 percent of GHG emissions in the Bay Area. Energy production activities such as electricity generation and co-generation were the third largest contributor with approximately 14 percent of the total GHG emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 1.5 percent of GHG emissions.

City of San Rafael Emissions. In February 2018, The Marin Climate & Energy Partnership prepared the City of San Rafael Community Greenhouse Gas Emissions Inventory for Year 2015 to determine the progress the City has made on reducing GHG emissions since 2005.²⁶ The inventory quantifies GHG emissions from a wide variety of sources and is arranged by sector to facilitate detailed analysis of emissions sources and comparison of increases and decreases since 2005.²⁷

As shown in Table F, the City reduced communitywide GHG emissions by approximately 16 percent since 2005 from 473,881 to 399,832 MT CO₂e. The largest percentage of GHG emissions are from the transportation sector, approximately 62 percent, followed by the residential sector and the non-residential sector, both at 17 percent respectively. The waste sector was responsible for approximately 3 percent, while the off-road, wastewater, and water sectors represented 1 percent or less of all GHG emissions.

²⁴ California Air Resources Board, 2017. *California Greenhouse Gas Emissions for 2000 to 2015*. Website: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2015/ghg_inventory_trends_00-15.pdf.

²⁵ Bay Area Air Quality Management District, 2015. *Source Inventory of Bay Area Greenhouse Gas Emissions*. January.

²⁶ Marin Climate & Energy Partnership, 2018. *City of San Rafael Community Greenhouse Gas Emissions Inventory for Year 2015*. February.

²⁷ Ibid.

Table F: City of San Rafael Greenhouse Gas Emissions by Sector, 2005 and 2015

Sector	2005 Greenhouse Gas Emissions		2015 Greenhouse Gas Emissions		Change in Greenhouse Gas Emissions	
	Metric Tons CO ₂ e	Percent of Total	Metric Tons CO ₂ e	Percent of Total	Change in Metric Tons CO ₂ e	Percent Change in Metric Tons
Residential Energy	89,940	19.0	67,850	17.0	-22,090	-24.6
Non-residential Energy	90,899	19.2	67,931	17.0	-22,968	-25.3
Transportation	268,187	56.6	245,746	61.5	-22,441	-8.4
Waste	15,917	3.4	11,498	2.9	-4,419	-27.8
Water	2,712	0.6	1,166	0.3	-1,546	-57.0
Wastewater	1,479	0.3	1,588	0.4	109	7.4
Off-Road	4,747	1.0	4,053	1.0	-694	-14.6
Total	473,881	100	399,832	100	-30,329	-15.6

Source: Marin Climate & Energy Partnership, 2018.

METHODOLOGY

Numerous air quality modeling tools are available to assess air quality impacts of projects; however, certain air districts such as the BAAQMD have created guidelines and requirements to conduct air quality analysis. The analysis of air quality impacts for the proposed project followed the BAAQMD CEQA Air Quality Guidelines.²⁸

In June 2010, BAAQMD adopted updated draft California Environmental Quality Act (CEQA) Air Quality Guidelines and finalized them in May 2011. These guidelines superseded previously adopted agency air quality guidelines of 1999 and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In late 2010, the Building Industry Association filed a lawsuit in Alameda Superior Court, challenging the BAAQMD CEQA Guidelines on the grounds that the agency did not comply with CEQA. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD CEQA Air Quality Guidelines. The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD complied with CEQA. In May of 2012, the BAAQMD filed an appeal of the court's decision. In August of 2013 the First District Court of Appeal overturned the trial court and held that the thresholds of significance were not subject to CEQA review. The Court of Appeal decision was appealed to the California Supreme Court, which granted limited review.

²⁸ Bay Area Air Quality Management District, 2011, op. cit.

On December 21, 2015, the California Supreme Court rejected the BAAQMD requirement for a so-called reverse CEQA analysis, and concluding that CEQA does not generally require a lead agency to consider the effects of existing environmental conditions on a proposed project's future residents. The Court also noted that assessing the impacts of the environment on the project is not required by CEQA.

In May 2017, the BAAQMD published an updated version of the CEQA Guidelines, which includes revisions made to address the Supreme Court's opinion. The 2017 CEQA Guidelines include thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These protective thresholds are appropriate in the context of the size, scale, and location of the project.

Operational Emissions. The air quality analysis includes estimating emissions associated with long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by mobile (indirect) sources associated with the proposed project. In addition, localized air quality impacts (i.e., higher carbon monoxide concentrations or "hot spots") near intersections or roadway segments in the project vicinity would potentially occur due to project generated vehicle trips.

Consistent with BAAQMD guidance for estimating emissions associated with land use development projects, the latest version of the computer program CalEEMod (v.2016.3.2) was used to calculate the long-term operational emissions associated with the project.

Construction Emissions. Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. Construction activities are considered temporary; however, short term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline powered equipment, portable auxiliary equipment, and worker commute trips. CalEEMod was used to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site.

Greenhouse Gas Emissions. GHG emissions associated with the project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term GHG emissions associated with project-related vehicular trips. Recognizing that the field of global climate change analysis is rapidly evolving, the approaches advocated most recently indicate that lead agencies should calculate, or estimate, emissions from vehicular traffic, energy consumption, water conveyance and treatment, waste generation, construction activities, and any other significant source of emissions within the project area. CalEEMod was used to quantify GHG emissions generated by the proposed project.

Mobile Source Health Risk Assessment. Determining how hazardous a substance is depends on many factors, including the amount of the substance in the air, how it enters the body, how long the exposure lasts, and what organs in the body are affected. One major way hazardous substances might enter the body is through inhalation of either gases or particulates. Many gases and very small particles that penetrate deeply into the lungs are potentially harmful and can contribute to a variety

of health problems. Exhaust from diesel engines is a major source of harmful airborne particles. The inhalation of diesel exhaust particulates is associated with both cancer and non-cancer health effects.

The California Office of Environmental Health Hazard Assessment (OEHHA) has determined that long-term exposure to diesel exhaust particulates poses the highest cancer risk of any toxic air contaminant (TAC) it has evaluated. Exposure to diesel exhaust can also have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheaded-ness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Fortunately, improvements to diesel fuel and diesel engines have already reduced emissions of some of the contaminants. When fully implemented these improvements result in a 75 percent reduction in particle emissions from diesel-powered trucks and other equipment today as compared to year 2000 levels and an 85 percent reduction is expected by 2020.²⁹ Similarly, improvements have been made to significantly reduce TAC emissions from gasoline-powered vehicles. These improvements are anticipated to continue into the foreseeable future.

According to ARB,³⁰ when conducting an HRA, the surrogate for whole diesel exhaust is diesel particulate matter (DPM), and is used as the basis for the potential risk calculations. When conducting an HRA, the potential cancer risk from inhalation exposure to DPM will outweigh the potential noncancerous health impacts. Therefore, inhalation cancer risk is required for every HRA. When comparing whole diesel exhaust to speciated diesel exhaust (i.e., speciation means looking at the individual components of the exhaust, such as polynuclear aromatic hydrocarbons and metals), potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components. For this reason, there are few situations where an analysis of multi-pathway risk is necessary. The analysis herein assesses whole diesel exhaust emissions as DPM.³¹

To estimate the potential cancer risk associated with the proposed project from diesel vehicle engine exhaust, a dispersion model was used to translate an emission rate from a source location (i.e., Highway 101) to a concentration at the receptor locations of interest (i.e., the proposed project site). Dispersion modeling varies from the simpler, more conservative screening-level analysis to the more complex and refined detailed analysis. This assessment was conducted using the EPA dispersion model AERMOD version 18081. The model provides a detailed estimate of concentrations

²⁹ California Environmental Protection Agency, Office of Environmental Health Hazard Assessment and American Lung Association of California, 2002. *Health Effects of Diesel Exhaust*. April.

³⁰ California Air Resources Board, 2005. *Appendix K, Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines*. Available online at: www.arb.ca.gov/toxics/harp/docs/userguide/appendixK.pdf.

³¹ California Office of Environmental Health Hazard Assessment, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, Appendix D, Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Vehicles, Section B*. February.

considering site and source geometry, source strength, distance to receptor, wake effects on plume distribution, and site specific meteorological data.

The HRA was conducted following the OEHHA and BAAQMD Guidelines and recommendations of the ARB.³² The analysis consists of several steps: determining the PM₁₀ emission factor, determining source emission rates, and determining concentrations at a project site; translating the PM₁₀ concentrations into health risk values; and comparing the health risk values to BAAQMD thresholds to determine significance.

According to rulemaking on the identification of particulate emissions from diesel-fueled engines as a toxic air contaminant, the available data from studies of humans exposed to diesel exhaust are not sufficient for deriving an acute noncancerous reference exposure level (REL) value.³³ While the lung is a major target organ for diesel exhaust, studies of the gross respiratory effects of diesel exhaust in exposed workers have not provided sufficient exposure information to establish a short-term noncancerous REL value for respiratory effects. Therefore, only long-term carcinogenic impacts are evaluated for DPM.³⁴

Analyses conducted by the OEHHA indicate that both the prenatal and postnatal life stages can be much more susceptible to developing cancer than the adult life stage. The analyses also indicate that the age sensitivity factors (ASFs) for these age windows vary by chemical, gender, and species. The BAAQMD recommends a cancer risk adjustment factor of 1.7 for a 70 year evaluation period for projects to account for exposure from as early as the third trimester through the 70 year analysis period. The exposure assumptions are very conservative in that they assume an individual would reside at a location from birth through 70 years, while typically, for residential projects similar to the proposed project, residents live there for approximately 5 years.

THRESHOLDS OF SIGNIFICANCE

The State CEQA Guidelines indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors);

³² California Air Resources Board, 2005. *HARP Model Documentation, Appendix K, Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines*. February.

³³ California Air Resources Board, 1998. *Identifying Particulate Emissions from Diesel-Fueled Engines as a Toxic Air Contaminant*. July.

³⁴ Note that OEHHA, ARB, and BAAQMD have not identified acute health effects from diesel exhaust. Therefore, acute health effects are not included in this analysis.

- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The BAAQMD has further defined these criteria of significance to indicate the project would result in a significant air quality impact if it would:

- Violate the Bay Area Air Quality Management District's air quality standards or contribute substantially to an existing or projected air quality violation by:
 - Generating average daily criteria air pollutant emissions of ROG, NO_x or PM_{2.5} exhaust emissions in excess of 54 pounds per day or PM₁₀ exhaust emissions of 82 pounds per day during project construction;
 - For project operations, generating average daily criteria air pollutant emissions of ROG, NO_x, or PM_{2.5} in excess of 54 pounds per day, or maximum annual emissions of 10 tons per year. For emissions of PM₁₀, generating average daily emissions of 82 pounds per day or 15 tons per year; or
 - Contributing to CO concentrations exceeding the State ambient air quality standards of 9 ppm averaged over 8 hours and 20 ppm for 1-hour for project operations.
- Expose sensitive receptors (including residential areas) or the general public to toxic air contaminants in excess of the following thresholds:
 - An excess cancer risk level of more than 10 in one million, or non-cancer (i.e., chronic or acute) risk greater than 1.0 hazard index from a single source;
 - An incremental increase of greater than 0.3 µg/m³ annual average PM_{2.5} from a single source;
 - An excess cancer risk level of more than 100 in one million, or non-cancer risk greater than 100 in one million from all sources; or
 - An incremental increase of greater than 0.8 µg/m³ annual average PM_{2.5} from all sources.

It should be noted that the emission thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

The State CEQA Guidelines indicate that a project would normally have a significant adverse greenhouse gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

The BAAQMD has further defined these criteria of significance to indicate the project would result in a less-than-significant air quality impact if it would:

- Result in operational-related greenhouse gas emissions of less than 1,100 metric tons of CO₂e a year, or
- Result in operational-related greenhouse gas emissions of less than 4.6 metric tons of CO₂e per service population (residents plus employees).

IMPACTS AND MITIGATION MEASURES

The project would affect air quality both during construction and operation. Operational impacts would be indirect and related to vehicle trips generated by future residents.

This section identifies the air quality impacts associated with implementation of the proposed project. Mitigation measures are recommended, as appropriate, for significant impacts to eliminate or reduce them to a less-than-significant level. This section also identifies impacts that are considered to be less-than-significant.

Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly-emitted particulate matter (PM_{2.5} and PM₁₀), and TACs such as diesel exhaust particulate matter.

Site preparation and project construction would involve grading, paving, and building activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM₁₀ emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM₁₀ emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The BAAQMD has established standard measures for reducing fugitive dust

emissions (PM₁₀). With the implementation of these Basic Construction Mitigation Measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM₁₀ emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO₂, NO_x, VOCs and some soot particulate (PM_{2.5} and PM₁₀) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

The project would include the demolition of 4,000 cubic yards of existing building material, 58,160 cubic yards of cut, and 580 cubic yards of material fill, all of which were included as inputs to the CalEEMod analysis. Other construction activities would be typical for this type of project; therefore, default assumptions (e.g., construction fleet activities and duration) from CalEEMod were used. For purposes of this CalEEMod analysis, the construction schedule for all improvements was assumed to be approximately 15 months. Construction emissions were estimated for the project using CalEEMod, consistent with BAAQMD recommendations. Construction-related emissions are presented in Table G. CalEEMod output sheets are included in Appendix A.

Table G: Project Construction Emissions in Pounds Per Day

Project Construction	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}
Average Daily Emissions	6.6	22.7	0.9	0.9
BAAQMD Thresholds	54.0	54.0	82.0	54.0
Exceed Threshold?	No	No	No	No

Source: LSA, May 2018.

As shown in Table G, construction emissions associated with the project would be less than significant for ROG, NO_x and PM_{2.5} and PM₁₀ exhaust emissions. The BAAQMD requires the implementation of Basic Construction Mitigation Measures to reduce construction dust impacts to a less-than-significant level as follows:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.

- Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact at the City of San Rafael regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations.

Operational Air Quality Impacts

Long-term air emission impacts are those associated with area sources and mobile sources involving any change related to the proposed project. In addition to the short-term construction emissions, the project would also generate long-term air emissions, such as those associated with changes in permanent use of the project site. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with the proposed project. Area sources, such as natural gas heaters, landscape equipment, and use of consumer products, would also result in pollutant emissions.

PM₁₀ emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM₁₀ occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. Since much of the project traffic fleet would be made up of light-duty gasoline-powered vehicles, a majority of the PM₁₀ emissions would result from entrainment of roadway dust from vehicle travel.

Energy source emissions result from activities in buildings for which electricity and natural gas are used (non-hearth). The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Major sources of energy demand include building mechanical systems, such as heating and air conditioning, lighting, and plug-in electronics, such as refrigerators or cooking equipment. Greater building or appliance efficiency reduces the amount of energy for a given activity and thus lowers the resultant emissions. The emission factor is determined by the fuel source, with cleaner energy sources, like renewable energy, producing fewer emissions than conventional sources.

Area source emissions associated with the project would include emissions from water heating and the use of landscaping equipment.

Emission estimates for the project were calculated using CalEEMod. Model results are shown in Table H. The traditional residential units were assumed to be condo/townhouse units while the senior residential units were assumed to be mid-rise apartment units. Trip generation rates for the project were based on the project’s trip generation memorandum which estimates the proposed project would generate approximately 719 trips per day. The project site is currently developed with a gas station which generates 1,145 trips per day. Therefore, the project would result in a net decrease of 426 trips per day over existing conditions.³⁵

The daily emissions associated with project operational trip generation, energy and area sources are identified in Table H for ROG, NO_x, PM₁₀, and PM_{2.5}. The primary emissions associated with the project are regional in nature, meaning that air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the air basin. Because the resulting emissions are dispersed rapidly and contribute only a small fraction of the region’s air pollution, air quality in the immediate vicinity of the project site would not substantially change compared to existing conditions or the air quality monitoring data reported in Table D.

Table H: Project Operational Emissions

	ROG	NO _x	PM ₁₀	PM _{2.5}
Emissions in Pounds Per Day				
Area Source Emissions	3.9	0.1	0.1	0.1
Energy Source Emissions	0.1	0.6	0.0	0.0
Mobile Source Emissions	0.0	0.0	0.0	0.0
Total Emissions	4.0	0.7	0.1	0.1
BAAQMD Significance Threshold	54.0	54.0	82.0	54.0
Exceed?	No	No	No	No
Emissions in Tons Per Year				
Area Source Emissions	0.7	0.0	0.0	0.0
Energy Source Emissions	0.0	0.1	0.0	0.0
Mobile Source Emissions	0.0	0.0	0.0	0.0
Total Emissions	0.7	0.1	0.0	0.0
BAAQMD Significance Threshold	10.0	10.0	15.0	10.0
Exceed?	No	No	No	No

Source: LSA, May 2018.

The results shown in Table H indicate the project would not exceed the significance criteria for daily or annual ROG, NO₂, PM₁₀ or PM_{2.5} emissions; therefore, the proposed project would not have a significant effect on regional air quality and mitigation would not be required.

³⁵ WTrans, 2016. *Trip Generation for 1005, 1020, and 1025 Northgate Drive*. February.

Localized CO Impacts

The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to BAAQMD CEQA Guidelines, a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, and the regional transportation plan and local congestion management agency plans.

- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, or below-grade roadway).

Implementation of the proposed project would not conflict with the Transportation Authority of Marin Congestion Management Program for designated roads or highways, a regional transportation plan, or other agency plans. The project site is not located in an area where vertical or horizontal mixing of air is substantially limited. In addition, the proposed project is expected to generate approximately 719 trips per day, which is a net decrease of 426 trips per day over existing conditions on the project site. Therefore, the proposed project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour and would not result in localized CO concentrations that exceed State or federal standards.

Exposure of Sensitive Receptors to Toxic Air Contaminants

Future residents of the project site could be exposed to elevated levels of toxic air contaminants from vehicle emissions on high volume roadways or from stationary sources in the project vicinity. LSA conducted a mobile source HRA to determine the health risk to future residents.

Mobile Source HRA. Annual traffic data obtained from Caltrans were used as an input to the model. According to Caltrans, the total annual average daily traffic (AADT) along Highway 101 is 186,000 vehicles. Emission factors for vehicle emissions were determined using the ARB EMFAC2017. EMFAC 2017 is a mathematical model that was developed to calculate emission rates from motor vehicles that operate on highways, freeways, and local roads in California and is used by the ARB to project changes in future emissions from on-road mobile sources. EMFAC2017 also includes assumptions of technological and regulatory changes that will reduce emission rates over time. The model only allows for a single emission rate for the entire 70-year health risk evaluation period. BAAQMD guidance allows for the consideration of changes in emission factors from a base year to future year to represent the long-term 70-year evaluation period. This HRA did not include any adjustment to account for future reduction in PM₁₀ truck emissions and instead selected a conservative year for estimating a worst-case exposure estimate.

The derivation of the emission rates by the total AADT and the average speed, including the classification of the total AADT into diesel vehicle type categories and the corresponding total emissions for that volume of diesel vehicles at the aggregate speed (5-90 MPH) are shown in Appendix B. For the purpose of this assessment, it is assumed that the traffic volumes are constant throughout the year. The PM₁₀ emission rates used in the analysis were determined based on the vehicle distribution by type according to ARB EMFAC2017 Project Level Burden fleet mix³⁶ and Caltrans traffic data for Highway 101.³⁷

For purposes of this analysis, diesel vehicle exhaust was modeled along Highway 101 as an 8-lane highway with 231 volume sources for each lane. The sources were modeled to approximately a half a mile along the northeastern and southeastern edges of the project site. The analysis also assumes that all units would include standard air conditioning and heating systems. Model snap shots of the sources are shown in Appendix C.

Modeled receptors were placed at the project site to characterize the risk level isopleths. Meteorological data to represent the conditions at the project site were obtained from the ARB for the Marin County Airport (i.e., Gness Field) meteorological station. The meteorological data indicate a frequent presence of wind at the project site from the west, with speeds averaging about 5.04 miles per hour. See Appendix C for the model’s graphical representation of the receptor grid for the site. Appendix B includes the risk calculation inputs and results.

Results of the analysis are shown in Table I. Results indicate that vehicle exhaust concentrations at the project site would result in health risk levels that would not exceed significance thresholds established by BAAQMD.

Table I: Inhalation Health Risks from all Roadway Sources

Exposure Duration	Carcinogenic Inhalation Health Risk	Chronic Inhalation Hazard Index	PM _{2.5} Concentration (µg/m ³)
70 years	6.94	0.0025	0.083
Threshold	10 in a million	1.0	0.3

Source: LSA, May 2018.

Carcinogenic and Chronic Impacts. The results for carcinogenic and chronic impacts are also shown in Table I. Results of the analysis indicate that the maximum single source MEI inhalation cancer risk, associated with living at the proposed development for 70 years would be 6.94 in 1 million, which would be lower than the threshold of 10 in 1 million. Risk calculations are included in Appendix C. The maximum chronic Hazard Index would be 0.0025, which is below the threshold of 1.0.

³⁶ California Air Resources Board. Mobile Source Emissions Inventory – Categories. Website: www.arb.ca.gov/msei/categories.htm (accessed December 2015).

³⁷ California Department of Transportation. Traffic Census Program, Traffic Counts. Website: traffic-counts.dot.ca.gov (accessed December 2015).

Ambient PM_{2.5}. The annual average concentration standard for PM_{2.5} is 0.3 micrograms per cubic meter. As shown in Table I, for future residents of the project site, the total concentration would be 0.083, which is below the threshold of 0.3. Therefore, the exposure to PM_{2.5} concentrations would not be significant.

As shown in Table I, a 70-year outdoor exposure of freeway emissions, including diesel particulate matter, at the proposed residential units on the project site would result in a maximum exposure of future residents to a risk level that is below the BAAQMD criterion of significance for cancer health effects (10 in 1 million). Key factors affecting HRA results include the site's distance from Highway 101, truck traffic density and wind direction and speed. The project is located approximately 30 feet from Highway 101. Based on data collected by Caltrans; this section of Highway 101 has 4.4 percent truck traffic. The percentage of truck traffic increases the resulting carcinogenic inhalation health risk; however, given this relatively low level of truck traffic and distance from the freeway, this source of emissions was demonstrated to be less than significant.

The HRA results estimate a risk that would not exceed the BAAQMD criteria for mobile source cancer health risks and therefore, future residents of the project site would not be exposed to substantial diesel particulate concentrations that would cause harmful effects. Health risk associated with the location of new sensitive receptors on the project site would be less than significant.

Stationary Sources. The stationary source analysis evaluated the risk levels from permitted sources in the project vicinity, using the toxic air contaminant emissions reported to the BAAQMD for the stationary sources in Marin County. The BAAQMD identified four sources of emissions that were within 1,000 feet of the project site at 1005 Northgate Drive, all of which are gas stations. Five sources of emissions were identified within 1,000 feet of the project site at 1010 Northgate Drive, of which five are gas stations and one is a generator. The results of the stationary source analysis are presented in Tables J and Table K. Following BAAQMD guidance, the stationary sources were scaled for distance using the BAAQMD Gasoline Dispensing Facility (GDF) Distance Multiplier Tool and Diesel Internal Combustion (IC) Engine Distance Multiplier Tool, both of which are shown in Appendix D. The results indicate that sources in the project vicinity would not exceed the stationary source threshold for risk and hazard at the individual or cumulative level. Therefore, future residents of the project site would not be exposed to significant health risk impacts from nearby stationary sources.

Consistency with Existing Air Quality Plans

The applicable air quality plan is the BAAQMD Final 2017 Clean Air Plan, which was adopted on April 19, 2017. The Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defines a control strategy to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce GHG emissions to protect the climate. Consistency with the Clean Air Plan can be determined if the project does the following: 1) supports the goals of the Clean Air Plan; 2) includes applicable control measures from the Clean Air Plan; and 3) would not disrupt or hinder implementation of any control measures from the Clean Air Plan.

Table J: Stationary Sources within 1,000 feet of 1005 Northgate Drive

Facility ID	Plant ID	Stationary Source (address & name)	Distance (feet)	Adjusted Risk (in one million)	PM _{2.5} Concentration (µg/m ³)	Hazard
149	G1909	949 Del Presidio Blvd, Chevron Station (gas station)	455	2.09	n/a	0.002
1011	G11970	921 Del Presidio Blvd, Unocal SS #4774 (gas station)	561	1.19	n/a	0.001
662	G12308	950 Del Presidio Blvd, Northgate Shell (gas station)	661	1.83	n/a	0.002
663	G10516	930 Del Presidio Blvd, Northgate Valero (gas station)	763	1.64	n/a	0.001
Total Health Risk				6.75	n/a	0.006
BAAQMD Cumulative Threshold				100 in a million	0.80	10.0
Exceed? (Yes/No)				No	No	No

Notes: n/a= Not Applicable

Source: BAAQMD, 2018; LSA May 2018.

Table K: Stationary Sources within 1,000 feet of 1010 Northgate Drive

Facility ID	Plant ID	Stationary Source (address & name)	Distance (feet)	Adjusted Risk (in one million)	PM _{2.5} Concentration (µg/m ³)	Hazard
149	G1909	949 Del Presidio Blvd, Chevron Station (gas station)	455	2.09	n/a	0.002
662	G12308	950 Del Presidio Blvd, Northgate Shell (gas station)	480	3.10	n/a	0.003
1011	G11970	921 Del Presidio Blvd, Unocal SS #4774 (gas station)	697	0.85	n/a	0.001
663	G10516	930 Del Presidio Blvd, Northgate Valero (gas station)	761	1.64	n/a	0.001
48	18422	7 Professional Center Parkway, AT&T (generator)	375	1.22	0.000	0.002
Total Health Risk				8.9	n/a	0.0125
BAAQMD Cumulative Threshold				100 in a million	0.80	10.0
Exceed? (Yes/No)				No	No	No

Notes: n/a= Not Applicable

Source: BAAQMD, 2015; LSA, May 2018.

Transportation and Mobile Source Control Measures. The BAAQMD identifies control measures as part of the Clean Air Plan to reduce ozone precursor emissions from stationary, area, mobile, and transportation sources. The Transportation Control Measures are designed to reduce emissions

from motor vehicles by reducing vehicle trips and vehicle miles traveled (VMT) in addition to vehicle idling and traffic congestion. The proposed project would not conflict with the identified Transportation and Mobile Source Control Measures of the Clean Air Plan.

Land Use and Local Impact Measures. The Clean Air Plan includes Land Use and Local Impacts Measures (LUMs) to achieve the following: promote mixed-use, compact development to reduce motor vehicle travel and emissions; and ensure that planned growth is focused in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. The LUMs identified by the BAAQMD are not specifically applicable to the proposed project as they relate to actions the BAAQMD will take to reduce impacts from goods movement and health risks in affected communities. However, the proposed project is pedestrian-adjacent to shopping, transit, and multiple major employers. The project integrates pathways designed for access to nearby services via walking or biking. These features ensure the project would not conflict with any of the LUMs of the Clean Air Plan.

Energy Measures. The Clean Air Plan also includes Energy and Climate Control Measures, which are designed to reduce ambient concentrations of criteria pollutants and reduce emissions of CO₂. Implementation of these measures is intended to promote energy conservation and efficiency in buildings throughout the community, promote renewable forms of energy production, reduce the “urban heat island” effect by increasing reflectivity of roofs and parking lots, and promote the planting of (low-VOC-emitting) trees to reduce biogenic emissions, lower air temperatures, provide shade, and absorb air pollutants. The measures include voluntary approaches to reduce the heat island effect by increasing shading in urban and suburban areas through the planting of trees. The proposed project would include paved area that could result in a heating effect. In addition, with development of the proposed project, existing trees would be removed. However, the proposed project includes landscaping with trees and shrubs throughout the site. The energy measures of the Clean Air Plan are not specifically applicable to the proposed project. Therefore the project would not conflict with the Energy and Climate Control Measures.

As discussed above, implementation of the proposed project would not disrupt or hinder implementation of the applicable measures outlined in the Clean Air Plan, including Transportation and Mobile Source Control Measures, Land Use and Local Impact Measures, and Energy Measures.

Cumulative Impact Assessment

CEQA defines a cumulative impact as two or more individual effects, which when considered together, are considerable or which compound or increase other environmental impacts. According to the BAAQMD, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself; result in nonattainment of ambient air quality standards. Instead, a project’s individual emissions contribute to existing cumulatively significant adverse air quality impacts. Therefore, if daily average or annual emissions of operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a cumulatively significant impact.

As shown in Table H, above, implementation of the proposed project would generate less than significant operational emissions. As shown in the project-specific air quality impacts discussion

above, the proposed project would not result in individually significant impacts and therefore would also not make a cumulatively considerable contribution to regional air quality impacts.

Greenhouse Gas Analysis

This section discusses the project's impacts related to the release of GHG emissions for both construction and project operation.

Construction Activities. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO₂, CH₄, and N₂O. Furthermore, CH₄ is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction.

Using CalEEMod, it is estimated that the project would generate approximately 923.4 metric tons of CO₂e per year. Implementation of the BAAQMD Basic Construction Mitigation Measures would reduce GHG emissions during the construction period to a less-than-significant level.

Operational GHG Emissions. Long-term operation of the proposed project would generate GHG emissions from area and mobile sources as well as indirect emissions from sources associated with energy consumption. Mobile-source GHG emissions would include project-generated vehicle trips associated with resident's trips to the project site. Area-source emissions would be associated with activities such as landscaping and maintenance of proposed land uses, and other sources.

Operational emissions estimates for the proposed project are discussed below and were calculated using a method that is consistent with methodology recommended in the BAAQMD CEQA Air Quality Guidelines, as described below.

Methodology. The methodology and/or qualitative description of the sources of GHG emissions associated with transportation, electricity, water use, and solid waste disposal are described below.

Transportation. Transportation associated with the proposed project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips. Transportation is the largest source of GHG emissions in California and represents approximately 37 percent of annual CO₂ emissions in the State. For land use development projects, vehicle miles traveled (VMT) and vehicle trips are the most direct indicators of GHG emissions associated with the proposed project. The proposed project is expected to generate approximately 719 trips per day, which is a net decrease of 426 trips per day based on counts of existing trips to the project site.

Electricity and Natural Gas. Buildings represent 39 percent of United States primary energy use and 70 percent of electricity consumption.³⁸ Electricity use can result in GHG production if the electricity is generated by combusting fossil fuel. The project is anticipated to increase the use of electricity and natural gas; however, as part of the project's compliance with the latest California building code standards, the project is expected to be relatively energy efficient and would incorporate green building measures in compliance with current CALGreen standard building measures for residential buildings and Title 24 requirements.

Water Use. Water and wastewater related GHG emissions are based on water supply and conveyance, water treatment, water distribution, and wastewater treatment. Each element of the water use cycle has unique energy intensities (kilowatt hours [kWh]/million gallons). Recognizing that the actual energy intensity in each component of the water use cycle will vary by utility, the California Energy Commission (CEC) assumes that approximately 3,950 kWh per million gallons are consumed for water that is supplied, treated, consumed, treated again, and disposed of in northern California.

Solid Waste Disposal. Solid waste generated by the project could contribute to GHG emissions in a variety of ways. Average waste generation rates from a variety of sources are available from the California Department of Resources, Recycling and Recovery (Cal Recycle).³⁹ Land filling and other methods of disposal use energy for transporting and managing the waste, and these activities produce additional GHGs to varying degrees. Land filling, the most common waste management practice, results in the release of CH₄ from the anaerobic decomposition of organic materials. CH₄ is 25 times more potent a GHG than CO₂. However, landfill CH₄ can also be a source of energy. In addition, many materials in landfills do not decompose fully, and the carbon that remains is sequestered in the landfill and not released into the atmosphere.

Project Emissions. When calculating project GHG emissions to compare to the thresholds of significance, the BAAQMD recommends that the lead agency consider project design features, attributes, and local development requirements as part of the project as proposed and not as mitigation measures. Consistent with BAAQMD guidance, GHG emissions were estimated using CalEEMod.

Table L shows the calculated GHG emissions for the proposed project. The project would not generate any new vehicle trips; therefore, the project would not have mobile source emissions. Energy use is the largest category at approximately 83 percent of CO₂e emissions. Area source emissions are approximately 1 percent of the total emissions, and waste and water source emissions are approximately 6 percent and 10 percent of the total, respectively. Additional calculation details are provided in Appendix A.

Based on the analysis results, the proposed project would generate 311.8 metric tons of CO₂e which would be well below BAAQMD numeric threshold of 1,100 metric tons CO₂e.

³⁸ United States Department of Energy, 2003. *Buildings Energy Data Book*.

³⁹ California Department of Resources, Recycling and Recovery, 2012. *Estimated Solid Waste Generation and Disposal Rates*. Website: www.calrecycle.ca.gov/wastechar/wastegenrates/.

Table L: GHG Emissions (Metric Tons Per Year)

Emissions Source	Operational Emissions				Percent of Total
	CO ₂	CH ₄	N ₂ O	CO ₂ e	
Area Sources Emissions	1.7	0.0	0.0	1.7	1
Energy Source Emissions	259.1	0.0	0.0	260.9	83
Mobile Source Emissions	0.0	0.0	0.0	0.0	0
Waste Source Emissions	12.7	0.8	0.0	31.5	10
Water Source Emissions	10.3	0.2	0.0	17.8	6
Total Annual Emissions				311.8	100

Source: LSA, May 2018.

The project would develop 136 residential units which would provide residence for approximately 332 people.⁴⁰ The proposed project would also result in an addition of approximately five new employees; therefore the total service population (residents plus employees) would be 337 people. Therefore, the project’s GHG emissions would result in a GHG efficiency of 0.9 metric tons CO₂e per service population which is also well below the BAAQMD threshold of 4.6. According to the BAAQMD, a project would have less-than-significant GHG emissions if it would meet one or more of the criteria. Therefore, because the project results in emissions below the 4.6 metric tons CO₂e per service and numeric threshold, the project would not have a significant effect on the environment related to GHG emissions.

⁴⁰ San Rafael, City of. 2014. *City of San Rafael 2015-2023. Housing Element Update*. July. Based on 2.44 persons per household.

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APPENDIX A

CALEEMOD DATA

Northgate Walk Project - Bay Area AQMD Air District, Annual

Northgate Walk Project
Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	106.00	Dwelling Unit	5.00	106,000.00	303
Apartments Mid Rise	30.00	Dwelling Unit	0.81	30,000.00	86
Unenclosed Parking with Elevator	354.00	Space	1.00	141,600.00	0
Parking Lot	166.00	Space	1.00	66,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	5			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	313	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Northgate Walk Project - Bay Area AQMD Air District, Annual

Project Characteristics - CO2 intensity factor based on 5-year average (2016-2020) per PG&E, 2015

Land Use - Condo/Townhouse represents the traditional condos

Apartments Mid Rise represents the senior units

Project site is approximately 7.81 acres

Construction Phase - Default

Grading -

Demolition -

Vehicle Trips - Trip rates based on trip generation memorandum prepared for this project (W-Trans, 2016)

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Northgate Walk Project - Bay Area AQMD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	58,160.00
tblGrading	MaterialExported	0.00	4,000.00
tblGrading	MaterialImported	0.00	580.00
tblLandUse	LotAcreage	6.63	5.00
tblLandUse	LotAcreage	0.79	0.81
tblLandUse	LotAcreage	3.19	1.00
tblLandUse	LotAcreage	1.49	1.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	313
tblVehicleTrips	ST_TR	6.39	0.00
tblVehicleTrips	ST_TR	5.67	0.00
tblVehicleTrips	SU_TR	5.86	0.00
tblVehicleTrips	SU_TR	4.84	0.00
tblVehicleTrips	WD_TR	6.65	0.00
tblVehicleTrips	WD_TR	5.81	0.00

2.0 Emissions Summary

Northgate Walk Project - Bay Area AQMD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2019	3-31-2019	2.1922	2.1922
2	4-1-2019	6-30-2019	1.0053	1.0053
3	7-1-2019	9-30-2019	1.0163	1.0163
4	10-1-2019	12-31-2019	1.0241	1.0241
5	1-1-2020	3-31-2020	1.4518	1.4518
		Highest	2.1922	2.1922

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9898	0.0190	1.4501	9.1000e-004		0.0674	0.0674		0.0674	0.0674	6.2002	4.2055	10.4057	0.0116	4.1000e-004	10.8169
Energy	0.0144	0.1230	0.0524	7.9000e-004		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	278.0281	278.0281	0.0153	5.2100e-003	279.9630
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	12.6991	0.0000	12.6991	0.7505	0.0000	31.4615
Water						0.0000	0.0000		0.0000	0.0000	2.8112	9.5831	12.3942	0.2896	7.0000e-003	21.7212
Total	1.0042	0.1420	1.5024	1.7000e-003	0.0000	0.0773	0.0773	0.0000	0.0773	0.0773	21.7105	291.8166	313.5271	1.0670	0.0126	343.9625

Northgate Walk Project - Bay Area AQMD Air District, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6760	0.0118	1.0180	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6588	1.6588	1.6300e-003	0.0000	1.6996
Energy	0.0132	0.1124	0.0478	7.2000e-004		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	259.0649	259.0649	0.0144	4.8600e-003	260.8734
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	12.6991	0.0000	12.6991	0.7505	0.0000	31.4615
Water						0.0000	0.0000		0.0000	0.0000	2.2489	8.0523	10.3012	0.2317	5.6100e-003	17.7659
Total	0.6891	0.1241	1.0658	7.7000e-004	0.0000	0.0147	0.0147	0.0000	0.0147	0.0147	14.9481	268.7760	283.7241	0.9983	0.0105	311.8004

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	31.37	12.60	29.06	54.71	0.00	81.01	81.01	0.00	81.01	81.01	31.15	7.90	9.51	6.44	17.04	9.35

3.0 Construction Detail

Construction Phase

Northgate Walk Project - Bay Area AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Paving	Paving	1/28/2020	2/24/2020	5	20	
6	Architectural Coating	Architectural Coating	2/25/2020	3/23/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 2

Residential Indoor: 275,400; Residential Outdoor: 91,800; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,480 (Architectural Coating – sqft)

OffRoad Equipment

Northgate Walk Project - Bay Area AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Northgate Walk Project - Bay Area AQMD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	68.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	396.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	5,808.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	185.00	49.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	37.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.3800e-003	0.0000	7.3800e-003	1.1200e-003	0.0000	1.1200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8672
Total	0.0351	0.3578	0.2206	3.9000e-004	7.3800e-003	0.0180	0.0253	1.1200e-003	0.0167	0.0178	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8672

Northgate Walk Project - Bay Area AQMD Air District, Annual

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.1000e-004	0.0107	2.0800e-003	3.0000e-005	5.7000e-004	4.0000e-005	6.1000e-004	1.6000e-004	4.0000e-005	2.0000e-004	0.0000	2.6334	2.6334	1.4000e-004	0.0000	2.6369
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	4.0000e-004	4.1100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0722	1.0722	3.0000e-005	0.0000	1.0729
Total	8.5000e-004	0.0111	6.1900e-003	4.0000e-005	1.7600e-003	5.0000e-005	1.8000e-003	4.8000e-004	5.0000e-005	5.2000e-004	0.0000	3.7056	3.7056	1.7000e-004	0.0000	3.7098

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.3800e-003	0.0000	7.3800e-003	1.1200e-003	0.0000	1.1200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8671
Total	0.0351	0.3578	0.2206	3.9000e-004	7.3800e-003	0.0180	0.0253	1.1200e-003	0.0167	0.0178	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8671

Northgate Walk Project - Bay Area AQMD Air District, Annual

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.1000e-004	0.0107	2.0800e-003	3.0000e-005	5.7000e-004	4.0000e-005	6.1000e-004	1.6000e-004	4.0000e-005	2.0000e-004	0.0000	2.6334	2.6334	1.4000e-004	0.0000	2.6369
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	4.0000e-004	4.1100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0722	1.0722	3.0000e-005	0.0000	1.0729
Total	8.5000e-004	0.0111	6.1900e-003	4.0000e-005	1.7600e-003	5.0000e-005	1.8000e-003	4.8000e-004	5.0000e-005	5.2000e-004	0.0000	3.7056	3.7056	1.7000e-004	0.0000	3.7098

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	0.0217	0.2279	0.1103	1.9000e-004	0.0903	0.0120	0.1023	0.0497	0.0110	0.0607	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195

Northgate Walk Project - Bay Area AQMD Air District, Annual

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8100e-003	0.0620	0.0121	1.6000e-004	3.3400e-003	2.4000e-004	3.5800e-003	9.2000e-004	2.3000e-004	1.1500e-003	0.0000	15.3359	15.3359	8.1000e-004	0.0000	15.3561
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.4000e-004	2.4600e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6433	0.6433	2.0000e-005	0.0000	0.6437
Total	2.1400e-003	0.0622	0.0146	1.7000e-004	4.0500e-003	2.4000e-004	4.3000e-003	1.1100e-003	2.3000e-004	1.3400e-003	0.0000	15.9792	15.9792	8.3000e-004	0.0000	15.9998

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	0.0217	0.2279	0.1103	1.9000e-004	0.0903	0.0120	0.1023	0.0497	0.0110	0.0607	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195

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3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8100e-003	0.0620	0.0121	1.6000e-004	3.3400e-003	2.4000e-004	3.5800e-003	9.2000e-004	2.3000e-004	1.1500e-003	0.0000	15.3359	15.3359	8.1000e-004	0.0000	15.3561
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.4000e-004	2.4600e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6433	0.6433	2.0000e-005	0.0000	0.6437
Total	2.1400e-003	0.0622	0.0146	1.7000e-004	4.0500e-003	2.4000e-004	4.3000e-003	1.1100e-003	2.3000e-004	1.3400e-003	0.0000	15.9792	15.9792	8.3000e-004	0.0000	15.9998

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	26.6423	26.6423	8.4300e-003	0.0000	26.8530
Total	0.0258	0.2835	0.1629	3.0000e-004	0.0655	0.0140	0.0795	0.0337	0.0129	0.0465	0.0000	26.6423	26.6423	8.4300e-003	0.0000	26.8530

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3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0265	0.9093	0.1776	2.3200e-003	0.0491	3.4600e-003	0.0525	0.0135	3.3100e-003	0.0168	0.0000	224.9261	224.9261	0.0119	0.0000	225.2225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	4.0000e-004	4.1100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0722	1.0722	3.0000e-005	0.0000	1.0729
Total	0.0271	0.9097	0.1817	2.3300e-003	0.0502	3.4700e-003	0.0537	0.0138	3.3200e-003	0.0171	0.0000	225.9982	225.9982	0.0119	0.0000	226.2953

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	26.6422	26.6422	8.4300e-003	0.0000	26.8530
Total	0.0258	0.2835	0.1629	3.0000e-004	0.0655	0.0140	0.0795	0.0337	0.0129	0.0465	0.0000	26.6422	26.6422	8.4300e-003	0.0000	26.8530

Northgate Walk Project - Bay Area AQMD Air District, Annual

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0265	0.9093	0.1776	2.3200e-003	0.0491	3.4600e-003	0.0525	0.0135	3.3100e-003	0.0168	0.0000	224.9261	224.9261	0.0119	0.0000	225.2225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	4.0000e-004	4.1100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0722	1.0722	3.0000e-005	0.0000	1.0729
Total	0.0271	0.9097	0.1817	2.3300e-003	0.0502	3.4700e-003	0.0537	0.0138	3.3200e-003	0.0171	0.0000	225.9982	225.9982	0.0119	0.0000	226.2953

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0349	248.0349	0.0604	0.0000	249.5455
Total	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0349	248.0349	0.0604	0.0000	249.5455

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3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.6546	0.1680	1.4200e-003	0.0339	4.5000e-003	0.0384	9.8000e-003	4.3000e-003	0.0141	0.0000	136.2291	136.2291	7.5500e-003	0.0000	136.4178
Worker	0.0708	0.0524	0.5345	1.5400e-003	0.1542	1.0600e-003	0.1553	0.0410	9.8000e-004	0.0420	0.0000	139.5053	139.5053	3.7400e-003	0.0000	139.5988
Total	0.0952	0.7071	0.7025	2.9600e-003	0.1881	5.5600e-003	0.1937	0.0508	5.2800e-003	0.0561	0.0000	275.7344	275.7344	0.0113	0.0000	276.0165

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0346	248.0346	0.0604	0.0000	249.5452
Total	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0346	248.0346	0.0604	0.0000	249.5452

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3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.6546	0.1680	1.4200e-003	0.0339	4.5000e-003	0.0384	9.8000e-003	4.3000e-003	0.0141	0.0000	136.2291	136.2291	7.5500e-003	0.0000	136.4178
Worker	0.0708	0.0524	0.5345	1.5400e-003	0.1542	1.0600e-003	0.1553	0.0410	9.8000e-004	0.0420	0.0000	139.5053	139.5053	3.7400e-003	0.0000	139.5988
Total	0.0952	0.7071	0.7025	2.9600e-003	0.1881	5.5600e-003	0.1937	0.0508	5.2800e-003	0.0561	0.0000	275.7344	275.7344	0.0113	0.0000	276.0165

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0030	22.0030	5.3700e-003	0.0000	22.1372
Total	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0030	22.0030	5.3700e-003	0.0000	22.1372

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3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-003	0.0537	0.0135	1.3000e-004	3.0500e-003	2.6000e-004	3.3100e-003	8.8000e-004	2.5000e-004	1.1300e-003	0.0000	12.1877	12.1877	6.3000e-004	0.0000	12.2034
Worker	5.8300e-003	4.1700e-003	0.0432	1.3000e-004	0.0139	9.0000e-005	0.0140	3.6900e-003	9.0000e-005	3.7800e-003	0.0000	12.1668	12.1668	2.9000e-004	0.0000	12.1742
Total	7.6300e-003	0.0579	0.0567	2.6000e-004	0.0169	3.5000e-004	0.0173	4.5700e-003	3.4000e-004	4.9100e-003	0.0000	24.3545	24.3545	9.2000e-004	0.0000	24.3776

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0029	22.0029	5.3700e-003	0.0000	22.1371
Total	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0029	22.0029	5.3700e-003	0.0000	22.1371

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3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-003	0.0537	0.0135	1.3000e-004	3.0500e-003	2.6000e-004	3.3100e-003	8.8000e-004	2.5000e-004	1.1300e-003	0.0000	12.1877	12.1877	6.3000e-004	0.0000	12.2034
Worker	5.8300e-003	4.1700e-003	0.0432	1.3000e-004	0.0139	9.0000e-005	0.0140	3.6900e-003	9.0000e-005	3.7800e-003	0.0000	12.1668	12.1668	2.9000e-004	0.0000	12.1742
Total	7.6300e-003	0.0579	0.0567	2.6000e-004	0.0169	3.5000e-004	0.0173	4.5700e-003	3.4000e-004	4.9100e-003	0.0000	24.3545	24.3545	9.2000e-004	0.0000	24.3776

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1902
Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0149	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1902

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3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1901
Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0149	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1901

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3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4200e-003	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	1.0032	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582

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3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	8.8000e-004	9.0900e-003	3.0000e-005	2.9200e-003	2.0000e-005	2.9400e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.5614	2.5614	6.0000e-005	0.0000	2.5630
Total	1.2300e-003	8.8000e-004	9.0900e-003	3.0000e-005	2.9200e-003	2.0000e-005	2.9400e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.5614	2.5614	6.0000e-005	0.0000	2.5630

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4200e-003	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	1.0032	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582

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3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	8.8000e-004	9.0900e-003	3.0000e-005	2.9200e-003	2.0000e-005	2.9400e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.5614	2.5614	6.0000e-005	0.0000	2.5630
Total	1.2300e-003	8.8000e-004	9.0900e-003	3.0000e-005	2.9200e-003	2.0000e-005	2.9400e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.5614	2.5614	6.0000e-005	0.0000	2.5630

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	0.00	0.00	0.00		
Condo/Townhouse	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Condo/Townhouse	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Parking Lot	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Unenclosed Parking with Elevator	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	128.9268	128.9268	0.0120	2.4700e-003	129.9619
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	135.5388	135.5388	0.0126	2.6000e-003	136.6270
NaturalGas Mitigated	0.0132	0.1124	0.0478	7.2000e-004		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	130.1382	130.1382	2.4900e-003	2.3900e-003	130.9115
NaturalGas Unmitigated	0.0144	0.1230	0.0524	7.9000e-004		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	142.4893	142.4893	2.7300e-003	2.6100e-003	143.3360

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	261913	1.4100e-003	0.0121	5.1400e-003	8.0000e-005		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	13.9767	13.9767	2.7000e-004	2.6000e-004	14.0597
Condo/Townhouse	2.40824e+006	0.0130	0.1110	0.0472	7.1000e-004		8.9700e-003	8.9700e-003		8.9700e-003	8.9700e-003	0.0000	128.5126	128.5126	2.4600e-003	2.3600e-003	129.2763
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0144	0.1230	0.0524	7.9000e-004		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	142.4893	142.4893	2.7300e-003	2.6200e-003	143.3360

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5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	243567	1.3100e-003	0.0112	4.7800e-003	7.0000e-005		9.1000e-004	9.1000e-004		9.1000e-004	9.1000e-004	0.0000	12.9976	12.9976	2.5000e-004	2.4000e-004	13.0749
Condo/Townhouse	2.19513e+006	0.0118	0.1012	0.0430	6.5000e-004		8.1800e-003	8.1800e-003		8.1800e-003	8.1800e-003	0.0000	117.1405	117.1405	2.2500e-003	2.1500e-003	117.8366
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0132	0.1124	0.0478	7.2000e-004		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	130.1382	130.1382	2.5000e-003	2.3900e-003	130.9115

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	126660	17.9824	1.6700e-003	3.4000e-004	18.1268
Condo/Townhouse	530067	75.2559	6.9700e-003	1.4400e-003	75.8601
Parking Lot	23240	3.2995	3.1000e-004	6.0000e-005	3.3260
Unenclosed Parking with Elevator	274704	39.0009	3.6100e-003	7.5000e-004	39.3141
Total		135.5388	0.0126	2.5900e-003	136.6270

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5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	119971	17.0329	1.5800e-003	3.3000e-004	17.1696
Condo/Townhouse	517287	73.4416	6.8000e-003	1.4100e-003	74.0312
Parking Lot	20916	2.9695	2.8000e-004	6.0000e-005	2.9934
Unenclosed Parking with Elevator	249924	35.4828	3.2900e-003	6.8000e-004	35.7677
Total		128.9268	0.0120	2.4800e-003	129.9619

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6760	0.0118	1.0180	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6588	1.6588	1.6300e-003	0.0000	1.6996
Unmitigated	0.9898	0.0190	1.4501	9.1000e-004		0.0674	0.0674		0.0674	0.0674	6.2002	4.2055	10.4057	0.0116	4.1000e-004	10.8169

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1001					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5446					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.3138	7.2200e-003	0.4321	8.6000e-004		0.0618	0.0618		0.0618	0.0618	6.2002	2.5467	8.7469	9.9600e-003	4.1000e-004	9.1172
Landscaping	0.0313	0.0118	1.0180	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6588	1.6588	1.6300e-003	0.0000	1.6996
Total	0.9898	0.0190	1.4501	9.1000e-004		0.0674	0.0674		0.0674	0.0674	6.2002	4.2055	10.4057	0.0116	4.1000e-004	10.8169

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1001					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5446					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0313	0.0118	1.0180	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6588	1.6588	1.6300e-003	0.0000	1.6996
Total	0.6760	0.0118	1.0180	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6588	1.6588	1.6300e-003	0.0000	1.6996

7.0 Water Detail

7.1 Mitigation Measures Water

- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Install Low Flow Shower
- Use Water Efficient Irrigation System
- Use Water Efficient Landscaping

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	10.3012	0.2317	5.6100e-003	17.7659
Unmitigated	12.3942	0.2896	7.0000e-003	21.7212

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	1.95462 / 1.23226	2.7340	0.0639	1.5400e-003	4.7914
Condo/Townhouse	6.90633 / 4.35399	9.6602	0.2257	5.4600e-003	16.9297
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		12.3942	0.2896	7.0000e-003	21.7212

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	1.5637 / 1.15709	2.2723	0.0511	1.2400e-003	3.9189
Condo/Townhouse	5.52506 / 4.0884	8.0289	0.1806	4.3700e-003	13.8469
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		10.3012	0.2317	5.6100e-003	17.7659

8.0 Waste Detail

8.1 Mitigation Measures Waste

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Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	12.6991	0.7505	0.0000	31.4615
Unmitigated	12.6991	0.7505	0.0000	31.4615

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	13.8	2.8013	0.1656	0.0000	6.9400
Condo/Townhouse	48.76	9.8978	0.5850	0.0000	24.5215
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		12.6991	0.7505	0.0000	31.4615

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8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	13.8	2.8013	0.1656	0.0000	6.9400
Condo/Townhouse	48.76	9.8978	0.5850	0.0000	24.5215
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		12.6991	0.7505	0.0000	31.4615

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

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Equipment Type	Number
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11.0 Vegetation

Northgate Walk Project - Bay Area AQMD Air District, Summer

Northgate Walk Project
Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	106.00	Dwelling Unit	5.00	106,000.00	303
Apartments Mid Rise	30.00	Dwelling Unit	0.81	30,000.00	86
Unenclosed Parking with Elevator	354.00	Space	1.00	141,600.00	0
Parking Lot	166.00	Space	1.00	66,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	5			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	313	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Northgate Walk Project - Bay Area AQMD Air District, Summer

Project Characteristics - CO2 intensity factor based on 5-year average (2016-2020) per PG&E, 2015

Land Use - Condo/Townhouse represents the traditional condos

Apartments Mid Rise represents the senior units

Project site is approximately 7.81 acres

Construction Phase - Default

Grading -

Demolition -

Vehicle Trips - Trip rates based on trip generation memorandum prepared for this project (W-Trans, 2016)

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Northgate Walk Project - Bay Area AQMD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	58,160.00
tblGrading	MaterialExported	0.00	4,000.00
tblGrading	MaterialImported	0.00	580.00
tblLandUse	LotAcreage	6.63	5.00
tblLandUse	LotAcreage	0.79	0.81
tblLandUse	LotAcreage	3.19	1.00
tblLandUse	LotAcreage	1.49	1.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	313
tblVehicleTrips	ST_TR	6.39	0.00
tblVehicleTrips	ST_TR	5.67	0.00
tblVehicleTrips	SU_TR	5.86	0.00
tblVehicleTrips	SU_TR	4.84	0.00
tblVehicleTrips	WD_TR	6.65	0.00
tblVehicleTrips	WD_TR	5.81	0.00

2.0 Emissions Summary

Northgate Walk Project - Bay Area AQMD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.435 1	524.3169	1,662.752 0	1.5779	0.0805	1,726.178 7
Energy	0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	59.8905	2.0414	85.4942	0.1473	0.0000	10.6073	10.6073	0.0000	10.6073	10.6073	1,138.435 1	1,384.961 0	2,523.396 0	1.5944	0.0963	2,591.937 2

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171
Energy	0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.9523	0.7464	11.5729	4.5300e-003	0.0000	0.1119	0.1119	0.0000	0.1119	0.1119	0.0000	806.3596	806.3596	0.0351	0.0144	811.5308

Northgate Walk Project - Bay Area AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	93.40	63.43	86.46	96.92	0.00	98.95	98.95	0.00	98.95	98.95	100.00	41.78	68.04	97.80	85.03	68.69

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Paving	Paving	1/28/2020	2/24/2020	5	20	
6	Architectural Coating	Architectural Coating	2/25/2020	3/23/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 2

Residential Indoor: 275,400; Residential Outdoor: 91,800; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,480 (Architectural Coating – sqft)

OffRoad Equipment

Northgate Walk Project - Bay Area AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Northgate Walk Project - Bay Area AQMD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	68.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	396.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	5,808.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	185.00	49.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	37.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7383	0.0000	0.7383	0.1118	0.0000	0.1118			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	3.5134	35.7830	22.0600	0.0388	0.7383	1.7949	2.5332	0.1118	1.6697	1.7815		3,816.8994	3,816.8994	1.0618		3,843.4451

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0307	1.0426	0.2010	2.7400e-003	0.0594	4.0200e-003	0.0634	0.0163	3.8500e-003	0.0201		292.3041	292.3041	0.0150		292.6779
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0357	0.4473	1.2800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		127.1127	127.1127	3.3800e-003		127.1972
Total	0.0877	1.0783	0.6483	4.0200e-003	0.1826	4.8400e-003	0.1875	0.0490	4.6000e-003	0.0536		419.4168	419.4168	0.0183		419.8750

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7383	0.0000	0.7383	0.1118	0.0000	0.1118			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	3.5134	35.7830	22.0600	0.0388	0.7383	1.7949	2.5332	0.1118	1.6697	1.7815	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0307	1.0426	0.2010	2.7400e-003	0.0594	4.0200e-003	0.0634	0.0163	3.8500e-003	0.0201		292.3041	292.3041	0.0150		292.6779
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0357	0.4473	1.2800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		127.1127	127.1127	3.3800e-003		127.1972
Total	0.0877	1.0783	0.6483	4.0200e-003	0.1826	4.8400e-003	0.1875	0.0490	4.6000e-003	0.0536		419.4168	419.4168	0.0183		419.8750

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298		3,766.4529	3,766.4529	1.1917		3,796.2445

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3572	12.1427	2.3411	0.0319	0.6918	0.0468	0.7386	0.1896	0.0448	0.2344		3,404.483 2	3,404.483 2	0.1741		3,408.836 4
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	0.4257	12.1856	2.8779	0.0334	0.8397	0.0478	0.8875	0.2288	0.0457	0.2745		3,557.018 4	3,557.018 4	0.1782		3,561.473 0

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.452 9	3,766.452 9	1.1917		3,796.244 5
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298	0.0000	3,766.452 9	3,766.452 9	1.1917		3,796.244 5

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3572	12.1427	2.3411	0.0319	0.6918	0.0468	0.7386	0.1896	0.0448	0.2344		3,404.4832	3,404.4832	0.1741		3,408.8364
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	0.4257	12.1856	2.8779	0.0334	0.8397	0.0478	0.8875	0.2288	0.0457	0.2745		3,557.0184	3,557.0184	0.1782		3,561.4730

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292		2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	6.5523	1.3974	7.9497	3.3675	1.2856	4.6531		2,936.8068	2,936.8068	0.9292		2,960.0361

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6195	89.0465	17.1682	0.2337	5.0731	0.3434	5.4165	1.3902	0.3285	1.7187		24,966.2103	24,966.2103	1.2769		24,998.1337
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0357	0.4473	1.2800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		127.1127	127.1127	3.3800e-003		127.1972
Total	2.6766	89.0823	17.6155	0.2350	5.1963	0.3442	5.5406	1.4229	0.3293	1.7522		25,093.3229	25,093.3229	1.2803		25,125.3308

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	6.5523	1.3974	7.9497	3.3675	1.2856	4.6531	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6195	89.0465	17.1682	0.2337	5.0731	0.3434	5.4165	1.3902	0.3285	1.7187		24,966.2103	24,966.2103	1.2769		24,998.1337
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0570	0.0357	0.4473	1.2800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		127.1127	127.1127	3.3800e-003		127.1972
Total	2.6766	89.0823	17.6155	0.2350	5.1963	0.3442	5.5406	1.4229	0.3293	1.7522		25,093.3229	25,093.3229	1.2803		25,125.3308

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2272	6.1198	1.4944	0.0136	0.3317	0.0423	0.3740	0.0955	0.0405	0.1360		1,438.4199	1,438.4199	0.0761		1,440.3214
Worker	0.7035	0.4407	5.5164	0.0157	1.5197	0.0101	1.5298	0.4031	9.2700e-003	0.4124		1,567.7230	1,567.7230	0.0417		1,568.7650
Total	0.9308	6.5604	7.0108	0.0293	1.8514	0.0524	1.9038	0.4986	0.0498	0.5484		3,006.1429	3,006.1429	0.1177		3,009.0864

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2272	6.1198	1.4944	0.0136	0.3317	0.0423	0.3740	0.0955	0.0405	0.1360		1,438.4199	1,438.4199	0.0761		1,440.3214
Worker	0.7035	0.4407	5.5164	0.0157	1.5197	0.0101	1.5298	0.4031	9.2700e-003	0.4124		1,567.7230	1,567.7230	0.0417		1,568.7650
Total	0.9308	6.5604	7.0108	0.0293	1.8514	0.0524	1.9038	0.4986	0.0498	0.5484		3,006.1429	3,006.1429	0.1177		3,009.0864

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1858	5.5842	1.3320	0.0135	0.3317	0.0274	0.3591	0.0955	0.0262	0.1217		1,429.3694	1,429.3694	0.0704		1,431.1292
Worker	0.6430	0.3893	4.9636	0.0152	1.5197	9.8400e-003	1.5296	0.4031	9.0700e-003	0.4122		1,518.4366	1,518.4366	0.0366		1,519.3514
Total	0.8288	5.9735	6.2957	0.0287	1.8514	0.0372	1.8886	0.4986	0.0353	0.5338		2,947.8061	2,947.8061	0.1070		2,950.4805

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.1858	5.5842	1.3320	0.0135	0.3317	0.0274	0.3591	0.0955	0.0262	0.1217		1,429.3694	1,429.3694	0.0704			1,431.1292
Worker	0.6430	0.3893	4.9636	0.0152	1.5197	9.8400e-003	1.5296	0.4031	9.0700e-003	0.4122		1,518.4366	1,518.4366	0.0366			1,519.3514
Total	0.8288	5.9735	6.2957	0.0287	1.8514	0.0372	1.8886	0.4986	0.0353	0.5338		2,947.8061	2,947.8061	0.1070			2,950.4805

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140			2,225.5841
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000				0.0000
Total	1.4876	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140			2,225.5841

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.4876	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	100.0743					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	100.3165	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1286	0.0779	0.9927	3.0500e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		303.6873	303.6873	7.3200e-003		303.8703
Total	0.1286	0.0779	0.9927	3.0500e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		303.6873	303.6873	7.3200e-003		303.8703

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	100.0743					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	100.3165	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

Northgate Walk Project - Bay Area AQMD Air District, Summer

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1286	0.0779	0.9927	3.0500e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		303.6873	303.6873	7.3200e-003		303.8703
Total	0.1286	0.0779	0.9927	3.0500e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		303.6873	303.6873	7.3200e-003		303.8703

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

Northgate Walk Project - Bay Area AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	0.00	0.00	0.00		
Condo/Townhouse	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Northgate Walk Project - Bay Area AQMD Air District, Summer

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Condo/Townhouse	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Parking Lot	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Unenclosed Parking with Elevator	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137
NaturalGas Unmitigated	0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584

Northgate Walk Project - Bay Area AQMD Air District, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	717.57	7.7400e-003	0.0661	0.0281	4.2000e-004		5.3500e-003	5.3500e-003		5.3500e-003	5.3500e-003		84.4200	84.4200	1.6200e-003	1.5500e-003	84.9216
Condo/Townhouse	6597.9	0.0712	0.6080	0.2587	3.8800e-003		0.0492	0.0492		0.0492	0.0492		776.2241	776.2241	0.0149	0.0142	780.8368
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584

Northgate Walk Project - Bay Area AQMD Air District, Summer

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	0.667306	7.2000e-003	0.0615	0.0262	3.9000e-004		4.9700e-003	4.9700e-003		4.9700e-003	4.9700e-003		78.5066	78.5066	1.5000e-003	1.4400e-003	78.9731
Condo/Townhouse	6.01406	0.0649	0.5542	0.2359	3.5400e-003		0.0448	0.0448		0.0448	0.0448		707.5361	707.5361	0.0136	0.0130	711.7406
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

Northgate Walk Project - Bay Area AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171
Unmitigated	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.4351	524.3169	1,662.7520	1.5779	0.0805	1,726.1787

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5484					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9841					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	55.9314	1.2365	73.8964	0.1424		10.4907	10.4907		10.4907	10.4907	1,138.4351	504.0000	1,642.4351	1.5579	0.0805	1,705.3617
Landscaping	0.3478	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621		20.3169	20.3169	0.0200		20.8171
Total	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.4351	524.3169	1,662.7520	1.5779	0.0805	1,726.1787

Northgate Walk Project - Bay Area AQMD Air District, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5484					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9841					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3478	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621		20.3169	20.3169	0.0200		20.8171
Total	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171

7.0 Water Detail

7.1 Mitigation Measures Water

- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Install Low Flow Shower
- Use Water Efficient Irrigation System
- Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Northgate Walk Project - Bay Area AQMD Air District, Summer

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Northgate Walk Project - Bay Area AQMD Air District, Winter

Northgate Walk Project
Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	106.00	Dwelling Unit	5.00	106,000.00	303
Apartments Mid Rise	30.00	Dwelling Unit	0.81	30,000.00	86
Unenclosed Parking with Elevator	354.00	Space	1.00	141,600.00	0
Parking Lot	166.00	Space	1.00	66,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	5			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	313	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Northgate Walk Project - Bay Area AQMD Air District, Winter

Project Characteristics - CO2 intensity factor based on 5-year average (2016-2020) per PG&E, 2015

Land Use - Condo/Townhouse represents the traditional condos

Apartments Mid Rise represents the senior units

Project site is approximately 7.81 acres

Construction Phase - Default

Grading -

Demolition -

Vehicle Trips - Trip rates based on trip generation memorandum prepared for this project (W-Trans, 2016)

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Northgate Walk Project - Bay Area AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	58,160.00
tblGrading	MaterialExported	0.00	4,000.00
tblGrading	MaterialImported	0.00	580.00
tblLandUse	LotAcreage	6.63	5.00
tblLandUse	LotAcreage	0.79	0.81
tblLandUse	LotAcreage	3.19	1.00
tblLandUse	LotAcreage	1.49	1.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	313
tblVehicleTrips	ST_TR	6.39	0.00
tblVehicleTrips	ST_TR	5.67	0.00
tblVehicleTrips	SU_TR	5.86	0.00
tblVehicleTrips	SU_TR	4.84	0.00
tblVehicleTrips	WD_TR	6.65	0.00
tblVehicleTrips	WD_TR	5.81	0.00

2.0 Emissions Summary

Northgate Walk Project - Bay Area AQMD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.435 1	524.3169	1,662.752 0	1.5779	0.0805	1,726.178 7
Energy	0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	59.8905	2.0414	85.4942	0.1473	0.0000	10.6073	10.6073	0.0000	10.6073	10.6073	1,138.435 1	1,384.961 0	2,523.396 0	1.5944	0.0963	2,591.937 2

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171
Energy	0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.9523	0.7464	11.5729	4.5300e-003	0.0000	0.1119	0.1119	0.0000	0.1119	0.1119	0.0000	806.3596	806.3596	0.0351	0.0144	811.5308

Northgate Walk Project - Bay Area AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	93.40	63.43	86.46	96.92	0.00	98.95	98.95	0.00	98.95	98.95	100.00	41.78	68.04	97.80	85.03	68.69

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Paving	Paving	1/28/2020	2/24/2020	5	20	
6	Architectural Coating	Architectural Coating	2/25/2020	3/23/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 2

Residential Indoor: 275,400; Residential Outdoor: 91,800; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,480 (Architectural Coating – sqft)

OffRoad Equipment

Northgate Walk Project - Bay Area AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Northgate Walk Project - Bay Area AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	68.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	396.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	5,808.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	185.00	49.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	37.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7383	0.0000	0.7383	0.1118	0.0000	0.1118			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	3.5134	35.7830	22.0600	0.0388	0.7383	1.7949	2.5332	0.1118	1.6697	1.7815		3,816.8994	3,816.8994	1.0618		3,843.4451

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0316	1.0690	0.2177	2.6900e-003	0.0594	4.1000e-003	0.0635	0.0163	3.9300e-003	0.0202		287.4996	287.4996	0.0158		287.8934
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0603	0.0442	0.4223	1.1800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		117.0948	117.0948	3.1800e-003		117.1743
Total	0.0919	1.1131	0.6400	3.8700e-003	0.1826	4.9200e-003	0.1875	0.0490	4.6800e-003	0.0536		404.5943	404.5943	0.0189		405.0677

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7383	0.0000	0.7383	0.1118	0.0000	0.1118			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	3.5134	35.7830	22.0600	0.0388	0.7383	1.7949	2.5332	0.1118	1.6697	1.7815	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0316	1.0690	0.2177	2.6900e-003	0.0594	4.1000e-003	0.0635	0.0163	3.9300e-003	0.0202		287.4996	287.4996	0.0158		287.8934
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0603	0.0442	0.4223	1.1800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		117.0948	117.0948	3.1800e-003		117.1743
Total	0.0919	1.1131	0.6400	3.8700e-003	0.1826	4.9200e-003	0.1875	0.0490	4.6800e-003	0.0536		404.5943	404.5943	0.0189		405.0677

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298		3,766.4529	3,766.4529	1.1917		3,796.2445

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3674	12.4502	2.5352	0.0314	0.6918	0.0478	0.7396	0.1896	0.0457	0.2353		3,348.524 2	3,348.524 2	0.1835		3,353.111 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0724	0.0530	0.5068	1.4100e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		140.5138	140.5138	3.8200e-003		140.6092
Total	0.4398	12.5032	3.0420	0.0328	0.8397	0.0488	0.8884	0.2288	0.0466	0.2754		3,489.037 9	3,489.037 9	0.1873		3,493.720 1

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.452 9	3,766.452 9	1.1917		3,796.244 5
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298	0.0000	3,766.452 9	3,766.452 9	1.1917		3,796.244 5

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3674	12.4502	2.5352	0.0314	0.6918	0.0478	0.7396	0.1896	0.0457	0.2353		3,348.524 2	3,348.524 2	0.1835		3,353.111 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0724	0.0530	0.5068	1.4100e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		140.5138	140.5138	3.8200e-003		140.6092
Total	0.4398	12.5032	3.0420	0.0328	0.8397	0.0488	0.8884	0.2288	0.0466	0.2754		3,489.037 9	3,489.037 9	0.1873		3,493.720 1

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.806 8	2,936.806 8	0.9292		2,960.036 1
Total	2.5805	28.3480	16.2934	0.0297	6.5523	1.3974	7.9497	3.3675	1.2856	4.6531		2,936.806 8	2,936.806 8	0.9292		2,960.036 1

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6945	91.3018	18.5918	0.2299	5.0731	0.3504	5.4235	1.3902	0.3352	1.7254		24,555.8439	24,555.8439	1.3455		24,589.4805
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0603	0.0442	0.4223	1.1800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		117.0948	117.0948	3.1800e-003		117.1743
Total	2.7548	91.3459	19.0141	0.2311	5.1963	0.3512	5.5476	1.4229	0.3360	1.7589		24,672.9387	24,672.9387	1.3486		24,706.6548

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	6.5523	1.3974	7.9497	3.3675	1.2856	4.6531	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6945	91.3018	18.5918	0.2299	5.0731	0.3504	5.4235	1.3902	0.3352	1.7254		24,555.8439	24,555.8439	1.3455		24,589.4805
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0603	0.0442	0.4223	1.1800e-003	0.1232	8.2000e-004	0.1240	0.0327	7.5000e-004	0.0334		117.0948	117.0948	3.1800e-003		117.1743
Total	2.7548	91.3459	19.0141	0.2311	5.1963	0.3512	5.5476	1.4229	0.3360	1.7589		24,672.9387	24,672.9387	1.3486		24,706.6548

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2382	6.2026	1.7059	0.0133	0.3317	0.0430	0.3747	0.0955	0.0412	0.1366		1,402.6349	1,402.6349	0.0824		1,404.6944
Worker	0.7438	0.5447	5.2086	0.0145	1.5197	0.0101	1.5298	0.4031	9.2700e-003	0.4124		1,444.1691	1,444.1691	0.0392		1,445.1496
Total	0.9819	6.7473	6.9145	0.0278	1.8514	0.0531	1.9045	0.4986	0.0504	0.5490		2,846.8040	2,846.8040	0.1216		2,849.8440

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2382	6.2026	1.7059	0.0133	0.3317	0.0430	0.3747	0.0955	0.0412	0.1366		1,402.6349	1,402.6349	0.0824		1,404.6944
Worker	0.7438	0.5447	5.2086	0.0145	1.5197	0.0101	1.5298	0.4031	9.2700e-003	0.4124		1,444.1691	1,444.1691	0.0392		1,445.1496
Total	0.9819	6.7473	6.9145	0.0278	1.8514	0.0531	1.9045	0.4986	0.0504	0.5490		2,846.8040	2,846.8040	0.1216		2,849.8440

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1955	5.6466	1.5239	0.0132	0.3317	0.0278	0.3595	0.0955	0.0266	0.1221		1,393.2035	1,393.2035	0.0761		1,395.1069
Worker	0.6801	0.4810	4.6618	0.0140	1.5197	9.8400e-003	1.5296	0.4031	9.0700e-003	0.4122		1,398.7210	1,398.7210	0.0342		1,399.5763
Total	0.8756	6.1276	6.1856	0.0272	1.8514	0.0377	1.8891	0.4986	0.0357	0.5343		2,791.9245	2,791.9245	0.1104		2,794.6832

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1955	5.6466	1.5239	0.0132	0.3317	0.0278	0.3595	0.0955	0.0266	0.1221		1,393.2035	1,393.2035	0.0761		1,395.1069
Worker	0.6801	0.4810	4.6618	0.0140	1.5197	9.8400e-003	1.5296	0.4031	9.0700e-003	0.4122		1,398.7210	1,398.7210	0.0342		1,399.5763
Total	0.8756	6.1276	6.1856	0.0272	1.8514	0.0377	1.8891	0.4986	0.0357	0.5343		2,791.9245	2,791.9245	0.1104		2,794.6832

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.4876	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.4876	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	100.0743					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	100.3165	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1360	0.0962	0.9324	2.8100e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		279.7442	279.7442	6.8400e-003		279.9153
Total	0.1360	0.0962	0.9324	2.8100e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		279.7442	279.7442	6.8400e-003		279.9153

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	100.0743					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	100.3165	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

Northgate Walk Project - Bay Area AQMD Air District, Winter

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1360	0.0962	0.9324	2.8100e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		279.7442	279.7442	6.8400e-003		279.9153
Total	0.1360	0.0962	0.9324	2.8100e-003	0.3040	1.9700e-003	0.3059	0.0806	1.8100e-003	0.0824		279.7442	279.7442	6.8400e-003		279.9153

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

Northgate Walk Project - Bay Area AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	0.00	0.00	0.00		
Condo/Townhouse	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Northgate Walk Project - Bay Area AQMD Air District, Winter

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Condo/Townhouse	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Parking Lot	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812
Unenclosed Parking with Elevator	0.573139	0.040894	0.193976	0.114604	0.017740	0.005371	0.017133	0.024527	0.002545	0.002442	0.005942	0.000877	0.000812

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137
NaturalGas Unmitigated	0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584

Northgate Walk Project - Bay Area AQMD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	717.57	7.7400e-003	0.0661	0.0281	4.2000e-004		5.3500e-003	5.3500e-003		5.3500e-003	5.3500e-003		84.4200	84.4200	1.6200e-003	1.5500e-003	84.9216
Condo/Townhouse	6597.9	0.0712	0.6080	0.2587	3.8800e-003		0.0492	0.0492		0.0492	0.0492		776.2241	776.2241	0.0149	0.0142	780.8368
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0789	0.6742	0.2869	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.6440	860.6440	0.0165	0.0158	865.7584

Northgate Walk Project - Bay Area AQMD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	0.667306	7.2000e-003	0.0615	0.0262	3.9000e-004		4.9700e-003	4.9700e-003		4.9700e-003	4.9700e-003		78.5066	78.5066	1.5000e-003	1.4400e-003	78.9731
Condo/Townhouse	6.01406	0.0649	0.5542	0.2359	3.5400e-003		0.0448	0.0448		0.0448	0.0448		707.5361	707.5361	0.0136	0.0130	711.7406
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0721	0.6157	0.2620	3.9300e-003		0.0498	0.0498		0.0498	0.0498		786.0426	786.0426	0.0151	0.0144	790.7137

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

Northgate Walk Project - Bay Area AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171
Unmitigated	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.4351	524.3169	1,662.7520	1.5779	0.0805	1,726.1787

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5484					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9841					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	55.9314	1.2365	73.8964	0.1424		10.4907	10.4907		10.4907	10.4907	1,138.4351	504.0000	1,642.4351	1.5579	0.0805	1,705.3617
Landscaping	0.3478	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621		20.3169	20.3169	0.0200		20.8171
Total	59.8116	1.3672	85.2073	0.1430		10.5528	10.5528		10.5528	10.5528	1,138.4351	524.3169	1,662.7520	1.5779	0.0805	1,726.1787

Northgate Walk Project - Bay Area AQMD Air District, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5484					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9841					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3478	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621		20.3169	20.3169	0.0200		20.8171
Total	3.8803	0.1307	11.3109	6.0000e-004		0.0621	0.0621		0.0621	0.0621	0.0000	20.3169	20.3169	0.0200	0.0000	20.8171

7.0 Water Detail

7.1 Mitigation Measures Water

- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Install Low Flow Shower
- Use Water Efficient Irrigation System
- Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Northgate Walk Project - Bay Area AQMD Air District, Winter

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

APPENDIX B

HRA EMISSION RATES AND CALCULATIONS

HWY 101	AADT (A)	Trucks - % TOT (A)	Truck AADT	Modeled Distance (m)	Modeled Distance (mi)	Standard AC	Weighted Emissions Adjustment
MANUEL FREITAS PARKWAY	187000	4.40	8228	703.2	0.44	30%	56%

Emfac2017 (Year 2018)

Vehicle Category	AADT	PM10 EF (g/mi)	PM10 Emissions (g/day)	PM10 Emissions (Lbs/Yr)	PM2.5 EF (g/mi)	PM2.5 Emissions (g/day)	PM2.5 Emissions (g/sec)
ALL OTHER BUSES - DSL	29.17	0.19	0.95	0.76	0.18	0.91	0.000
LDA - DSL	1543.74	0.02	4.05	3.26	0.01	3.87	0.000
LDT1 - DSL	3.90	0.23	0.15	0.12	0.22	0.14	0.000
LDT2 - DSL	377.40	0.01	0.36	0.29	0.01	0.35	0.000
LHD1 - DSL	1915.91	0.04	11.66	9.38	0.03	11.16	0.000
LHD2 - DSL	569.26	0.03	2.73	2.20	0.03	2.61	0.000
MDV - DSL	787.31	0.01	0.79	0.63	0.01	0.75	0.000
MH - DSL	42.80	0.13	0.94	0.76	0.12	0.90	0.000
MOTOR COACH - DSL	29.58	0.16	0.82	0.66	0.15	0.79	0.000
PTO - DSL	27.96	0.28	1.35	1.09	0.27	1.30	0.000
SBUS - DSL	89.70	0.06	0.85	0.69	0.05	0.82	0.000
T6 CAIRP HEAVY - DSL	22.41	0.05	0.19	0.16	0.05	0.19	0.000
T6 CAIRP SMALL - DSL	0.61	0.12	0.01	0.01	0.11	0.01	0.000
T6 INSTATE CONSTRUCTION HEAVY - DSL	31.51	0.23	1.27	1.02	0.22	1.22	0.000
T6 INSTATE CONSTRUCTION SMALL - DSL	33.87	0.20	1.17	0.94	0.19	1.12	0.000
T6 INSTATE HEAVY - DSL	514.44	0.21	18.46	14.85	0.20	17.66	0.000
T6 INSTATE SMALL - DSL	217.93	0.17	6.24	5.02	0.16	5.97	0.000
T6 OOS HEAVY - DSL	13.35	0.05	0.12	0.09	0.05	0.11	0.000
T6 OOS SMALL - DSL	0.47	0.09	0.01	0.01	0.09	0.01	0.000
T6 PUBLIC - DSL	24.92	0.03	0.14	0.12	0.03	0.14	0.000
T6 UTILITY - DSL	1.95	0.01	0.00	0.00	0.01	0.00	0.000
T7 CAIRP - DSL	276.79	0.07	3.28	2.64	0.07	3.14	0.000
T7 CAIRP CONSTRUCTION - DSL	22.64	0.07	0.27	0.22	0.07	0.26	0.000
T7 NNOOS - DSL	337.69	0.08	4.55	3.66	0.07	4.35	0.000
T7 NOOS - DSL	108.63	0.07	1.29	1.04	0.07	1.24	0.000
T7 OTHER PORT - DSL	27.07	0.03	0.16	0.13	0.03	0.16	0.000
T7 POAK - DSL	146.14	0.04	0.98	0.79	0.04	0.94	0.000
T7 PUBLIC - DSL	93.65	0.06	0.96	0.77	0.06	0.91	0.000
T7 SINGLE - DSL	168.22	0.23	6.78	5.45	0.22	6.48	0.000
T7 SINGLE CONSTRUCTION - DSL	56.16	0.27	2.61	2.10	0.26	2.49	0.000
T7 SWCV - DSL	115.77	0.02	0.35	0.28	0.02	0.34	0.000
T7 TRACTOR - DSL	485.35	0.14	11.46	9.22	0.13	10.97	0.000
T7 TRACTOR CONSTRUCTION - DSL	46.33	0.22	1.75	1.40	0.21	1.67	0.000
T7 UTILITY - DSL	2.25	0.02	0.01	0.01	0.02	0.01	0.000
UBUS - DSL	63.12	0.01	0.08	0.06	0.01	0.08	0.000
Total	8228.00	---	87	69.8	---	83	0.0010
			Per lane	8.73	Per lane	10.38	0.00012

Sub-Area	GAI	Sub-Area	Cal_Year	Veh_Tech	County Total VMT	Axles	% VMT By Axle
Marin (SF)	41	Marin (SF)	2018	ALL OTHER BUSES - DSL	1,430.4	3	0.35%
Marin (SF)	41	Marin (SF)	2018	LDA - DSL	79,506.1	2	18.76%
Marin (SF)	41	Marin (SF)	2018	LDT1 - DSL	200.9	2	0.05%
Marin (SF)	41	Marin (SF)	2018	LDT2 - DSL	19,436.7	2	4.59%
Marin (SF)	41	Marin (SF)	2018	LHD1 - DSL	98,673.9	2	23.29%
Marin (SF)	41	Marin (SF)	2018	LHD2 - DSL	29,318.1	2	6.92%
Marin (SF)	41	Marin (SF)	2018	MDV - DSL	38,606.1	3	9.57%
Marin (SF)	41	Marin (SF)	2018	MH - DSL	2,098.9	3	0.52%
Marin (SF)	41	Marin (SF)	2018	MOTOR COACH - DSL	1,450.4	3	0.36%
Marin (SF)	41	Marin (SF)	2018	PTO - DSL	1,370.8	3	0.34%
Marin (SF)	41	Marin (SF)	2018	SBUS - DSL	4,398.7	3	1.09%
Marin (SF)	41	Marin (SF)	2018	T6 CAIRP HEAVY - DSL	919.9	5	0.27%
Marin (SF)	41	Marin (SF)	2018	T6 CAIRP SMALL - DSL	100.6	4	0.01%
Marin (SF)	41	Marin (SF)	2018	T6 INSTATE CONSTRUCTION HEAVY - DSL	1,293.3	5	0.38%
Marin (SF)	41	Marin (SF)	2018	T6 INSTATE CONSTRUCTION SMALL - DSL	5,589.9	4	0.41%
Marin (SF)	41	Marin (SF)	2018	T6 INSTATE HEAVY - DSL	21,112.2	5	6.25%
Marin (SF)	41	Marin (SF)	2018	T6 INSTATE SMALL - DSL	35,969.8	4	2.65%
Marin (SF)	41	Marin (SF)	2018	T6 OOS HEAVY - DSL	547.7	5	0.16%
Marin (SF)	41	Marin (SF)	2018	T6 OOS SMALL - DSL	78.2	4	0.01%
Marin (SF)	41	Marin (SF)	2018	T6 PUBLIC - DSL	4,113.5	4	0.30%
Marin (SF)	41	Marin (SF)	2018	T6 UTILITY - DSL	321.3	4	0.02%
Marin (SF)	41	Marin (SF)	2018	T7 CAIRP - DSL	11,359.1	5	3.36%
Marin (SF)	41	Marin (SF)	2018	T7 CAIRP CONSTRUCTION - DSL	929.0	5	0.28%
Marin (SF)	41	Marin (SF)	2018	T7 NNOOS - DSL	13,858.5	5	4.10%
Marin (SF)	41	Marin (SF)	2018	T7 NOOS - DSL	4,458.2	5	1.32%
Marin (SF)	41	Marin (SF)	2018	T7 OTHER PORT - DSL	1,110.9	5	0.33%
Marin (SF)	41	Marin (SF)	2018	T7 POAK - DSL	5,997.6	5	1.78%
Marin (SF)	41	Marin (SF)	2018	T7 PUBLIC - DSL	3,843.2	5	1.14%
Marin (SF)	41	Marin (SF)	2018	T7 SINGLE - DSL	6,903.8	5	2.04%
Marin (SF)	41	Marin (SF)	2018	T7 SINGLE CONSTRUCTION - DSL	2,304.7	5	0.68%
Marin (SF)	41	Marin (SF)	2018	T7 SWCV - DSL	4,751.3	5	1.41%
Marin (SF)	41	Marin (SF)	2018	T7 TRACTOR - DSL	19,918.2	5	5.90%
Marin (SF)	41	Marin (SF)	2018	T7 TRACTOR CONSTRUCTION - DSL	1,901.2	5	0.56%
Marin (SF)	41	Marin (SF)	2018	T7 UTILITY - DSL	92.4	5	0.03%
Marin (SF)	41	Marin (SF)	2018	UBUS - DSL	3,095.1	3	0.77%
					427,060.5		100.00%

Axles	Sum VMT By Axle	Caltrans % Truck by Axle
2	227,135.8	54%
3	52,450.3	13%
4	46,173.3	3%
5	101,301.1	30%

Calendar Year: 2018

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	PM10_RUNEX	PM2_5_RUNEX
MARIN	2018	All Other Buses	Aggregated	Aggregated	DSL	25.44492616	1430.380094	213.7373798	0.188504564	0.18034994
MARIN	2018	LDA	Aggregated	Aggregated	DSL	2219.687605	79506.11568	10390.02313	0.015190076	0.01453296
MARIN	2018	LDT1	Aggregated	Aggregated	DSL	15.57691171	200.861699	51.43887893	0.225157987	0.215417752
MARIN	2018	LDT2	Aggregated	Aggregated	DSL	463.3709853	19436.74246	2289.466041	0.005579415	0.005338052
MARIN	2018	LHD1	Aggregated	Aggregated	DSL	2499.201666	98673.93662	31436.81297	0.035270834	0.033745033
MARIN	2018	LHD2	Aggregated	Aggregated	DSL	696.6850956	29318.12052	8763.422073	0.027796102	0.026593655
MARIN	2018	MDV	Aggregated	Aggregated	DSL	968.1088093	38606.09036	4741.216428	0.00579757	0.00554677
MARIN	2018	MH	Aggregated	Aggregated	DSL	198.3796128	2098.890877	19.83796128	0.127118977	0.121619866
MARIN	2018	Motor Coach	Aggregated	Aggregated	DSL	11.55962526	1450.370964	168.7705289	0.160782519	0.153827139
MARIN	2018	PTO	Aggregated	Aggregated	DSL	0	1370.82543	0	0.280834051	0.268685294
MARIN	2018	SBUS	Aggregated	Aggregated	DSL	140.5014551	4398.652236	1621.367312	0.055140889	0.052755519
MARIN	2018	T6 CAIRP heavy	Aggregated	Aggregated	DSL	4.558369773	919.8526101	66.55219869	0.050197691	0.048026161
MARIN	2018	T6 CAIRP small	Aggregated	Aggregated	DSL	1.942446266	100.6413375	28.35971548	0.11680098	0.111748221
MARIN	2018	T6 instate construction heavy	Aggregated	Aggregated	DSL	19.47649663	1293.340291	88.05248402	0.234037965	0.223913586
MARIN	2018	T6 instate construction small	Aggregated	Aggregated	DSL	112.5406936	5589.852849	508.7921004	0.200742408	0.19205838
MARIN	2018	T6 instate heavy	Aggregated	Aggregated	DSL	167.1446262	21112.21515	1928.825812	0.207878793	0.198886049
MARIN	2018	T6 instate small	Aggregated	Aggregated	DSL	754.219632	35969.79519	8703.589985	0.166027924	0.15884563
MARIN	2018	T6 OOS heavy	Aggregated	Aggregated	DSL	2.69813901	547.6956159	39.39282955	0.050430868	0.048249251
MARIN	2018	T6 OOS small	Aggregated	Aggregated	DSL	1.459153184	78.21531412	21.30363648	0.090678442	0.086755733
MARIN	2018	T6 Public	Aggregated	Aggregated	DSL	263.4654914	4113.48547	799.1786564	0.033468984	0.032021131
MARIN	2018	T6 utility	Aggregated	Aggregated	DSL	19.19181326	321.3060819	220.7058525	0.010390322	0.009940841
MARIN	2018	T7 CAIRP	Aggregated	Aggregated	DSL	58.16822515	11359.08514	849.2560872	0.068610335	0.065642282
MARIN	2018	T7 CAIRP construction	Aggregated	Aggregated	DSL	4.734506558	929.0175656	21.40452007	0.069786428	0.066767498
MARIN	2018	T7 NNOOS	Aggregated	Aggregated	DSL	67.12197725	13858.47427	979.9808679	0.078020311	0.074645187
MARIN	2018	T7 NOOS	Aggregated	Aggregated	DSL	22.86355969	4458.230172	333.8079715	0.069039489	0.066052871
MARIN	2018	T7 other port	Aggregated	Aggregated	DSL	6.851153811	1110.856998	52.06876897	0.034845733	0.033338322
MARIN	2018	T7 POAK	Aggregated	Aggregated	DSL	56.20483081	5997.550288	427.1567141	0.038758022	0.037081367
MARIN	2018	T7 Public	Aggregated	Aggregated	DSL	189.9410763	3843.199918	576.1545976	0.059160454	0.056601199
MARIN	2018	T7 Single	Aggregated	Aggregated	DSL	105.9277266	6903.750872	1222.391279	0.233411082	0.223313822
MARIN	2018	T7 single construction	Aggregated	Aggregated	DSL	33.69350328	2304.721706	152.3270183	0.269077409	0.257437239
MARIN	2018	T7 SWCV	Aggregated	Aggregated	DSL	65.22366612	2664.93332	254.3722979	0.017726054	0.016959232
MARIN	2018	T7 tractor	Aggregated	Aggregated	DSL	139.664754	19918.17425	1773.742376	0.136839842	0.130920211
MARIN	2018	T7 tractor construction	Aggregated	Aggregated	DSL	27.15771713	1901.192498	122.7789833	0.218344532	0.208899044
MARIN	2018	T7 utility	Aggregated	Aggregated	DSL	4.551773002	92.4305282	52.34538952	0.019588169	0.018740794
MARIN	2018	UBUS	Aggregated	Aggregated	DSL	48.51855847	3016.143077	194.0742339	0.00736397	0.007045408
						9415.836582	424895.1474			

Area	Scen Year	HR	Gasoline VMT	Diesel VMT	Scalar Gasoline	Scalar Diesel	Hour Fraction
Marin	2018	1		13	#DIV/0!	0.55	3.6%
Marin	2018	2		12	#DIV/0!	0.50	3.3%
Marin	2018	3		14	#DIV/0!	0.61	4.0%
Marin	2018	4		7	#DIV/0!	0.31	2.0%
Marin	2018	5		7	#DIV/0!	0.30	2.0%
Marin	2018	6		7	#DIV/0!	0.30	1.9%
Marin	2018	7		15	#DIV/0!	0.63	4.1%
Marin	2018	8		17	#DIV/0!	0.74	4.8%
Marin	2018	9		24	#DIV/0!	1.00	6.5%
Marin	2018	10		23	#DIV/0!	0.96	6.3%
Marin	2018	11		21	#DIV/0!	0.88	5.7%
Marin	2018	12		23	#DIV/0!	0.99	6.4%
Marin	2018	13		21	#DIV/0!	0.89	5.8%
Marin	2018	14		21	#DIV/0!	0.90	5.8%
Marin	2018	15		19	#DIV/0!	0.81	5.3%
Marin	2018	16		17	#DIV/0!	0.71	4.6%
Marin	2018	17		20	#DIV/0!	0.86	5.6%
Marin	2018	18		20	#DIV/0!	0.83	5.4%
Marin	2018	19		14	#DIV/0!	0.58	3.8%
Marin	2018	20		7	#DIV/0!	0.31	2.0%
Marin	2018	21		12	#DIV/0!	0.50	3.3%
Marin	2018	22		13	#DIV/0!	0.56	3.6%
Marin	2018	23		10	#DIV/0!	0.44	2.9%
Marin	2018	24		5	#DIV/0!	0.21	1.4%
		Totals	0	364	#DIV/0!	15.39	100.0%
		Max Values	0	24			

Years of Data: 33

Exposure Years 70

Risk Year	Period (years)	Age Sensitivity Factor	Sensitivity Weighting Factor	EMFAC Year	Gasoline				Diesel			
					VMT /1000	Tons /day	Emission Rate (g/vehicle-mile)	Sensitivity Weighted Emission Rate (g/vehicle-mile)	VMT /1000	Tons /day	Emission Rate (g/vehicle-mile)	Sensitivity Weighted Emission Rate (g/vehicle-mile)
1	1	10.25	0.146				#DIV/0!	#DIV/0!	425	0.03	0.065	0.00947
2	1	10	0.143				#DIV/0!	#DIV/0!	428	0.03	0.054	0.00778
3	1	3	0.043				#DIV/0!	#DIV/0!	430	0.02	0.044	0.00189
4	1	3	0.043				#DIV/0!	#DIV/0!	433	0.02	0.038	0.00162
5	1	3	0.043				#DIV/0!	#DIV/0!	436	0.01	0.025	0.00109
6	1	3	0.043				#DIV/0!	#DIV/0!	438	0.01	0.017	0.00073
7	1	3	0.043				#DIV/0!	#DIV/0!	440	0.01	0.016	0.00070
8	1	3	0.043				#DIV/0!	#DIV/0!	442	0.01	0.016	0.00067
9	1	3	0.043				#DIV/0!	#DIV/0!	443	0.01	0.015	0.00065
10	1	3	0.043				#DIV/0!	#DIV/0!	444	0.01	0.015	0.00062
11	1	3	0.043				#DIV/0!	#DIV/0!	446	0.01	0.014	0.00060
12	1	3	0.043				#DIV/0!	#DIV/0!	447	0.01	0.014	0.00058
13	1	3	0.043				#DIV/0!	#DIV/0!	449	0.01	0.013	0.00056
14	1	3	0.043				#DIV/0!	#DIV/0!	451	0.01	0.013	0.00055
15	1	3	0.043				#DIV/0!	#DIV/0!	452	0.01	0.012	0.00053
16	1	1	0.014				#DIV/0!	#DIV/0!	455	0.01	0.012	0.00017
17	1	1	0.014				#DIV/0!	#DIV/0!	457	0.01	0.012	0.00017
18	1	1	0.014				#DIV/0!	#DIV/0!	460	0.01	0.012	0.00017
19	1	1	0.014				#DIV/0!	#DIV/0!	462	0.01	0.011	0.00016
20	1	1	0.014				#DIV/0!	#DIV/0!	465	0.01	0.011	0.00016
21	1	1	0.014				#DIV/0!	#DIV/0!	467	0.01	0.011	0.00016
22	1	1	0.014				#DIV/0!	#DIV/0!	470	0.01	0.011	0.00016
23	1	1	0.014				#DIV/0!	#DIV/0!	473	0.01	0.011	0.00016
24	1	1	0.014				#DIV/0!	#DIV/0!	475	0.01	0.011	0.00015
25	1	1	0.014				#DIV/0!	#DIV/0!	477	0.0057	0.011	0.00015
26	1	1	0.014				#DIV/0!	#DIV/0!	480	0.0057	0.011	0.00015
27	1	1	0.014				#DIV/0!	#DIV/0!	482	0.0057	0.011	0.00015
28	1	1	0.014				#DIV/0!	#DIV/0!	485	0.0057	0.011	0.00015
29	1	1	0.014				#DIV/0!	#DIV/0!	487	0.0057	0.011	0.00015
30	1	1	0.014				#DIV/0!	#DIV/0!	489	0.0057	0.011	0.00015
31	1	1	0.014				#DIV/0!	#DIV/0!	491	0.0057	0.011	0.00015
32	1	1	0.014				#DIV/0!	#DIV/0!	492	0.0058	0.011	0.00015
33	38	1	0.543				#DIV/0!	#DIV/0!	494	0.0058	0.011	0.00575
34	0	1	0.000				0.0000	0.00000			0.000	0.00000
35	0	1	0.000				0.0000	0.00000			0.000	0.00000
36	0	1	0.000				0.0000	0.00000			0.000	0.00000
70			1.6				70 yr g/VMT	#DIV/0!			70 yr g/VMT	0.0365

Note: at age 2*, the factors are weighted for 0.25 years by 10 and 0.75 years by 3; at age 16**, the factor is weighted by 0.25 years at 3 and 0.75 by 1.

TOG Adjustment Factor	#DIV/0!
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PM10 Adjustment Factor	0.56
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APPENDIX C

HRA MODEL IMAGES

Figure A: Cancer Risk

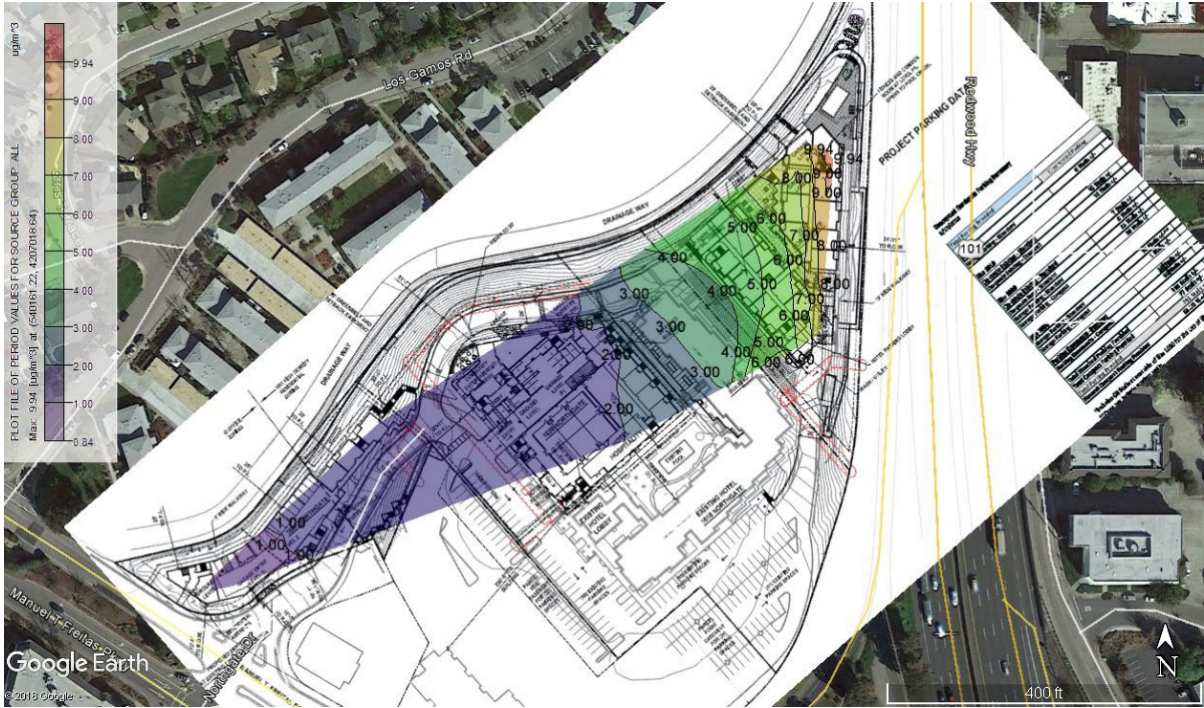


Figure B: Chronic Hazard Index

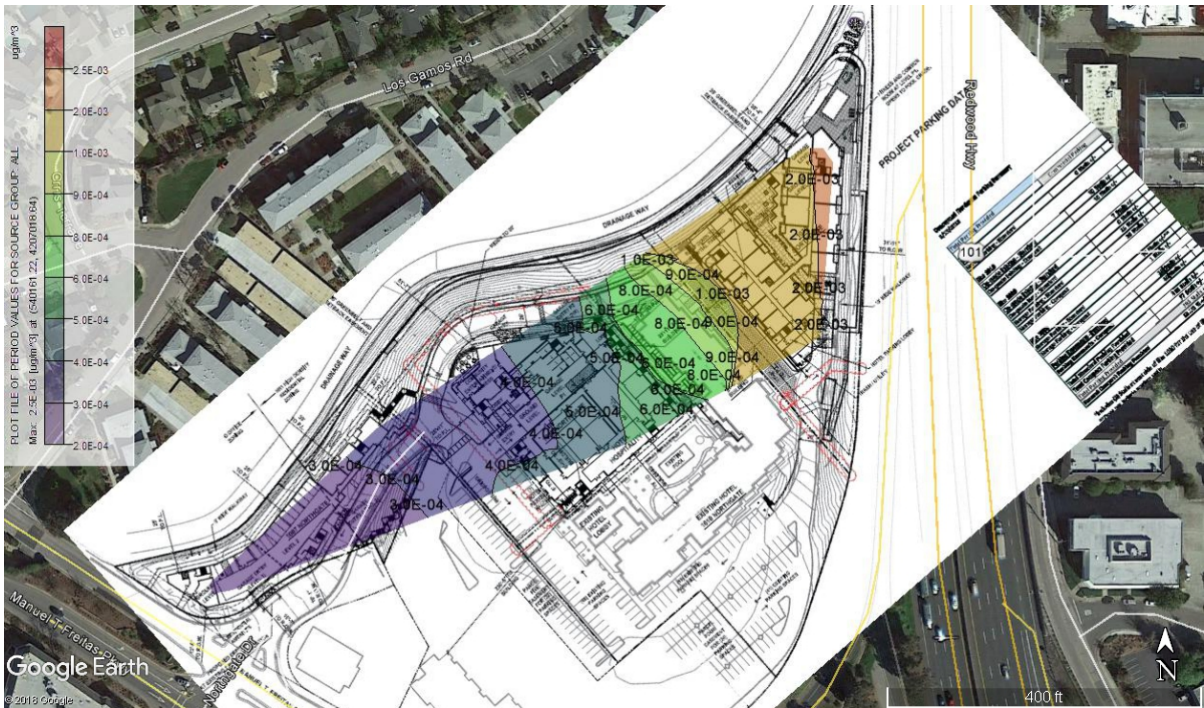


Figure C: PM_{2.5} Concentration

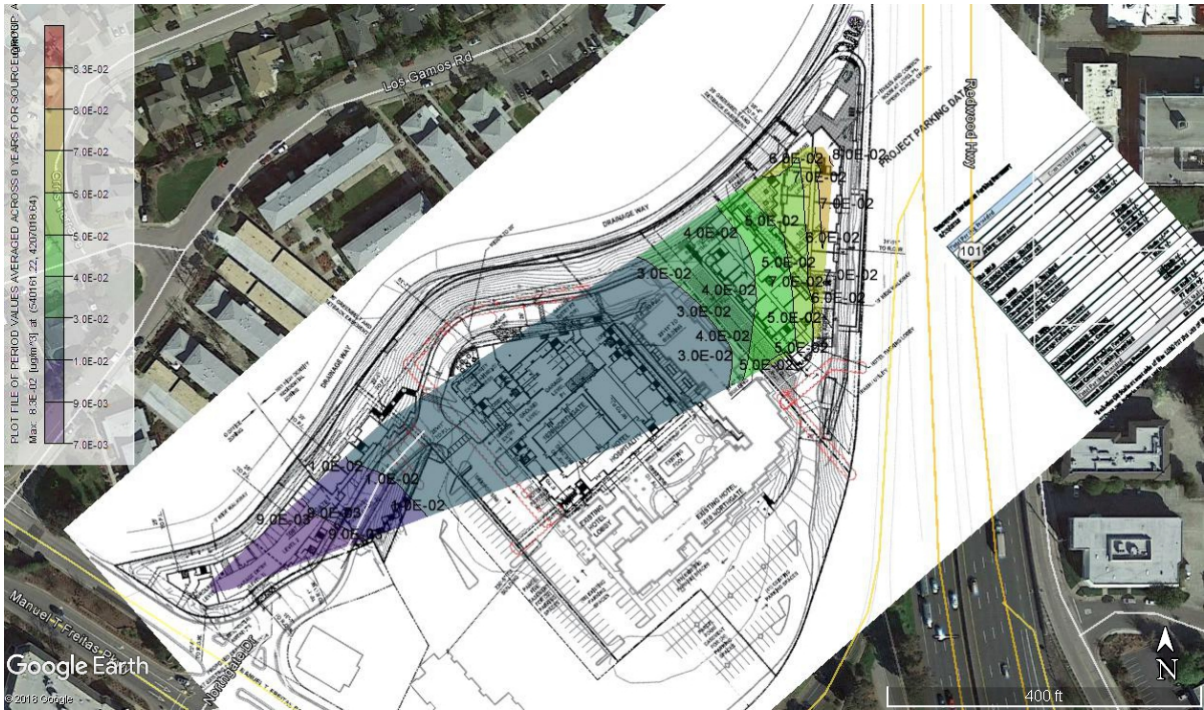


Figure D: Receptors

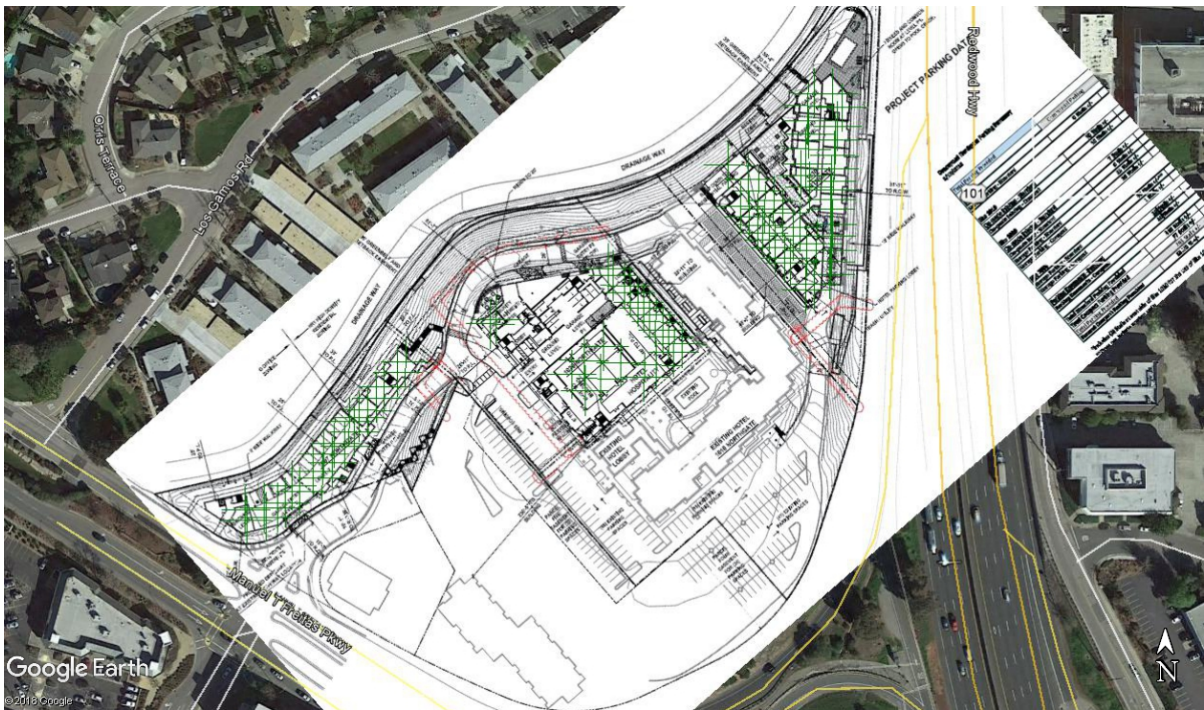


Figure E: Sources



APPENDIX D

STATIONARY SOURCE DISTANCE MULTIPLIER TOOLS

How to Use the Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)

This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions (GDF's).

1. Obtain the GDF cancer risk and/or chronic hazard index from the District's Stationary Source Screening Analysis tool for facilities where the Plant No. is preceded with a 'G'. If the distance to the nearest receptor is less than 20 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk and/or chronic hazard index estimate.
2. Determine the shortest distance from the GDF to the nearest receptor.
3. In the table below, enter the cancer risk and/or chronic hazard index found in step 1 for the GDF in the row which aligns with the shortest distance from each GDF to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 300 meters, use the multiplier 0.015. The resulting product is the adjusted cancer risk in a million or the adjusted chronic hazard index for the GDF.

Note: These distance adjustment multipliers may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for gasoline dispensing facilities. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

1005 Northgate Drive

Distance meters	Distance feet	Distance adjustment multiplier	Enter Cancer Risk	Adjusted Cancer Risk	Enter Chronic Hazard Index	Adjusted Chronic Hazard Index
20	66	1.000		0		0
25	82	0.728		0		0
30	98	0.559		0		0
35	115	0.445		0		0
40	131	0.365		0		0
45	148	0.305		0		0
50	164	0.260		0		0
55	180	0.225		0		0
60	197	0.197		0		0
65	213	0.174		0		0
70	230	0.155		0		0
75	246	0.139		0		0
80	262	0.126		0		0
85	279	0.114		0		0
90	295	0.104		0		0
95	312	0.096		0		0
100	328	0.088		0		0
105	344	0.082		0		0
110	361	0.076		0		0
115	377	0.071		0		0
120	394	0.066		0		0
125	410	0.062		0		0
130	426	0.058		0		0
135	443	0.055	38.197	2.088317615	0.035	0.00191353
140	459	0.052		0		0
145	476	0.049		0		0
150	492	0.046		0		0
155	508	0.044		0		0
160	525	0.042		0		0
165	541	0.040		0		0
170	558	0.038	31.611	1.191109069	0.029	0.001092726
175	574	0.036		0		0
180	590	0.034		0		0
185	607	0.033		0		0
190	623	0.031		0		0
195	640	0.030		0		0
200	656	0.029	63.222	1.829259028	0.057	0.001649232
205	672	0.028		0		0
210	689	0.027		0		0
215	705	0.026		0		0
220	722	0.025		0		0
225	738	0.024		0		0
230	754	0.023	71.125	1.640269484	0.065	0.001499016
235	771	0.022		0		0
240	787	0.022		0		0
245	804	0.021		0		0
250	820	0.020		0		0
255	836	0.020		0		0
260	853	0.019		0		0
265	869	0.018		0		0
270	886	0.018		0		0
275	902	0.017		0		0
280	918	0.017		0		0
285	935	0.016		0		0
290	951	0.016		0		0
295	968	0.015		0		0
300	984	0.015		0		0

How to Use the Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities (GDF)

This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions (GDF's).

1. Obtain the GDF cancer risk and/or chronic hazard index from the District's Stationary Source Screening Analysis tool for facilities where the Plant No. is preceded with a 'G'. If the distance to the nearest receptor is less than 20 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk and/or chronic hazard index estimate.

2. Determine the shortest distance from the GDF to the nearest receptor.

3. In the table below, enter the cancer risk and/or chronic hazard index found in step 1 for the GDF in the row which aligns with the shortest distance from each GDF to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 300 meters, use the multiplier 0.015. The resulting product is the adjusted cancer risk in a million or the adjusted chronic hazard index for the GDF.

Note: These distance adjustment multipliers may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for gasoline dispensing facilities. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

1010 Northgate Drive

Distance meters	Distance feet	Distance adjustment multiplier	Enter Cancer Risk	Adjusted Cancer Risk	Enter Chronic Hazard Index	Adjusted Chronic Hazard Index
20	66	1.000		0		0
25	82	0.728		0		0
30	98	0.559		0		0
35	115	0.445		0		0
40	131	0.365		0		0
45	148	0.305		0		0
50	164	0.260		0		0
55	180	0.225		0		0
60	197	0.197		0		0
65	213	0.174		0		0
70	230	0.155		0		0
75	246	0.139		0		0
80	262	0.126		0		0
85	279	0.114		0		0
90	295	0.104		0		0
95	312	0.096		0		0
100	328	0.088		0		0
105	344	0.082		0		0
110	361	0.076		0		0
115	377	0.071		0		0
120	394	0.066		0		0
125	410	0.062		0		0
130	426	0.058		0		0
135	443	0.055	38.197	2.088317615	0.035	0.00191353
140	459	0.052		0		0
145	476	0.049	63.222	3.080909556	0.057	0.002777702
150	492	0.046		0		0
155	508	0.044		0		0
160	525	0.042		0		0
165	541	0.040		0		0
170	558	0.038		0		0
175	574	0.036		0		0
180	590	0.034		0		0
185	607	0.033		0		0
190	623	0.031		0		0
195	640	0.030		0		0
200	656	0.029		0		0
205	672	0.028		0		0
210	689	0.027	31.661	0.84602532	0.029	0.00077492
215	705	0.026		0		0
220	722	0.025		0		0
225	738	0.024		0		0
230	754	0.023	71.125	1.640269484	0.065	0.001499016
235	771	0.022		0		0
240	787	0.022		0		0
245	804	0.021		0		0
250	820	0.020		0		0
255	836	0.020		0		0
260	853	0.019		0		0
265	869	0.018		0		0
270	886	0.018		0		0
275	902	0.017		0		0
280	918	0.017		0		0
285	935	0.016		0		0
290	951	0.016		0		0
295	968	0.015		0		0
300	984	0.015		0		0

How to Use the Distance Adjustment Multiplier Tool for Diesel Internal Combustion (IC) Engines

This distance multiplier tool refines the screening values for cancer risk and PM2.5 concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

1. Obtain the facility diesel IC engine(s) cancer risk and/or PM2.5 concentration from the District's Stationary Source Screening Analysis tool only for facilities where the source is listed as "generator." If the distance to the nearest receptor is less than 25 meters, the distance adjustment multiplier table cannot be used and an air dispersion modeling analysis using site-specific information is needed to refine the cancer risk, chronic hazard index or PM2.5 estimates.
2. Determine the shortest distance from each diesel IC engine to the nearest receptor. Select the shortest distance to receptor found.
3. In the table below, enter the cancer risk and/or PM2.5 concentration found in step 1 for the diesel IC engine in the row which aligns with the shortest distance from each diesel IC engine to the nearest receptor (found in step 2). If the shortest distance to the receptor falls between two distance values, select the multiplier corresponding to the smaller distance. For distances beyond 280 meters, use the multiplier 0.04. The resulting product is the adjusted cancer risk in a million or the adjusted PM2.5 concentration for the diesel IC engine

Note: This distance adjustment multiplier may be used only for the screening level health risk values indicated in the District's Stationary Source Screening Analysis tool for diesel IC engines. This distance multiplier tool may not be used to adjust values from an HRA if an HRA for the facility was conducted.

Note: This distance adjustment multiplier may also be used to adjust the screening values for chronic hazard index found in the District's Stationary Source Screening Analysis Tool for facilities with only diesel IC engines.

Distance (meters)	Distance (feet)	Distance Adjustment Multiplier	Enter Cancer Risk Estimate	Adjusted Cancer Risk Estimate	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
25	82	0.85		0		0
30	98.4	0.73		0		0
35	115	0.64		0		0
40	131	0.58		0		0
50	164	0.5		0		0
60	197	0.41		0		0
70	230	0.31		0		0
80	262	0.28		0		0
90	295	0.25		0		0
100	328	0.22		0		0
110	361	0.18	6.75	1.215	0.002	0.00036
120	394	0.16		0		0
130	426	0.15		0		0
140	459	0.14		0		0
150	492	0.12		0		0
160	525	0.1		0		0
180	590	0.09		0		0
200	656	0.08		0		0
220	722	0.07		0		0
240	787	0.06		0		0
260	853	0.05		0		0
280	918	0.04		0		0