1919 O'FARRELL STREET CONSTRUCTION COMMUNITY RISK ASSESSMENT

San Mateo, California

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Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of the proposed residential project located at 1919 O'Farrell Street in San Mateo, California. The air quality impacts from this project would be associated with construction of a new residential building. Air pollutant emissions associated with construction of the project were predicted using appropriate computer models. In addition, the potential project construction health risk impacts and the impact of existing toxic air contaminant (TAC) sources affecting the nearby and proposed sensitive receptors were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The approximate 0.63-acre project site currently contains a one-story office building and adjacent parking lots. The project proposes to demolish the existing structure and construct a four-story, 49-unit multi-family apartment building with a below-grade parking garage containing 64 parking spaces.

Setting

The project is located in San Mateo County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

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

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (EPA) sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the federal standards.

In the past decade the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of NO_X and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified DPM as a probable carcinogen. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce particulate matter and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[2]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 parts per million by weight [ppmw] to 15 ppmw), and by 99 percent for off-highway diesel fuel

[2] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.

(from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra-low sulfur diesel (ULSD), is currently required for use by all vehicles in the U.S.

All of the above federal diesel engine and diesel fuel requirements have been adopted by California, in some cases with modifications making the requirements more stringent or the implementation dates sooner.

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.[3] In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet 2010 or later engine standards that have much lower DPM and $PM_{2.5}$ emissions. This regulation will substantially reduce these emissions between 2013 and 2023. While new trucks and buses will meet strict federal standards, this measure is intended to accelerate the rate at which the fleet either turns over so there are more cleaner vehicles on the road or is retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads sooner.

CARB has also adopted and implemented regulations to reduce DPM and NO_X emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NO_X exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NO_X.

Bay Area Air Quality Management District (BAAQMD)

BAAQMD has jurisdiction over an approximately 5,600-square mile area, commonly referred to as the San Francisco Bay Area (Bay Area). The District's boundary encompasses the nine San Francisco Bay Area counties, including Alameda County, Contra Costa County, Marin County,

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

San Francisco County, San Mateo County, Santa Clara County, Napa County, southwestern Solano County, and southern Sonoma County.

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards and California Ambient Air Quality Standards. The District also has permit authority over most types of stationary equipment utilized for the proposed project. The BAAQMD is responsible for permitting and inspection of stationary sources; enforcement of regulations, including setting fees, levying fines, and enforcement actions; and ensuring that public nuisances are minimized.

BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area.[4] The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San José, Redwood City/East Palo Alto, and Eastern San Francisco. The project site is not within a CARE area.

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. *Attachment 1* includes detailed community risk modeling methodology.

<u>City of San Mateo Vision 2030 General Plan</u>

The Land Use Element of the City of San Mateo Vision 2030 General Plan includes goals, policies, and actions to reduce exposure of the City's sensitive population to exposure of air pollution, toxic air contaminants, and GHGs. The following goals, policies, and actions are applicable to the proposed project:

Climate Change Goals and Policies

Goal 8a Reduce greenhouse gas emissions each year consistent with the Climate Action Plan.

[4] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.

[5] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

Policy LU 8.1 Carbon Footprint. The City shall prepare an updated greenhouse gas emissions inventory consistent with the Climate Action Plan.

Policy LU 8.2 Effects of Climate Change. Incorporate consideration of the effects of climate change in development of General Plan updates, disaster planning, City projects, infrastructure planning, future policies and long-term strategies. Explore voluntary adjustments of base flood elevation.

Policy LU 8.3 GHG Emission Reductions. Monitor and report progress toward the City's GHG emissions reduction target on an annual basis and regularly review emission reduction measures and new opportunities consistent with guidance of the City's Climate Action Plan.

Air Quality Goals and Policies

Policy LU 8.9 Air Quality Construction Impacts. The City shall mitigate air quality impacts generated during construction activities by requiring the following measures:

1. Use of appropriate dust control measures, based on project size and latest BAAQMD guidance, shall be applied to all construction activities within San Mateo.

2. Applicants seeking demolition permits shall demonstrate compliance with applicable BAAQMD requirements involving lead paint and asbestos containing materials (ACM's) designed to mitigate exposure to lead paint and asbestos.

3. Utilization of construction emission control measures recommended by BAAQMD as appropriate for the specifics of the project (e.g., length of time of construction and distance from sensitive receptors). This may include the utilization of low emission construction equipment, restrictions on the length of time of use of certain heavy-duty construction equipment, and utilization of methods to reduce emissions from construction equipment (alternative fuels, particulate matter traps and diesel particulate filters).

Policy LU 8.11 Toxic Air Contaminants. The City shall require that when new development that would be a source of TACs is proposed near residences or sensitive receptors, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board and BAAQMD), or filters or other equipment/solutions shall be provided to reduce the potential exposure to acceptable levels.

When new residential or other sensitive receptors are proposed near existing sources of TAC's, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board

and BAAQMD), or filters or other equipment/solutions shall be provided to the source to reduce the potential exposure to acceptable levels.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are in the multi-family residences adjacent to the east of the project site. There are other nearby residences to the south and west of the project site. In addition, there is an early child development center (infants 6 weeks and older) and middle school (children 2 years and older) to the southeast and southwest of the site. This project would also introduce new sensitive receptors (i.e., residents) to the area.

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA and these significance thresholds were contained in the District's 2011 CEQA Air Quality Guidelines. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA. The thresholds were challenged through a series of court challenges and were mostly upheld. BAAQMD updated the CEQA Air Quality Guidelines in 2017 to include the latest significance thresholds, which were used in this analysis and are summarized in Table 1. Community risks are considered significant if they exceed these levels.

Table 1. BAAQMD CEQA Community Risk Significance Thresholds

Health Risks and Hazards	Single Sources Within ¼-Mile Zone of Influence	Combined Sources (Cumulative from all sources within ¼-Mile zone of influence)
Excess Cancer Risk	10.0 per one million	100 per one million
Hazard Index	1.0	10.0
Incremental annual $PM_{2.5}$	0.3 $\mu g/m^3$	0.8 $\mu g/m^3$
Note: PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.		

Construction Community Risk Impacts and Recommended Conditions of Approval (CoA)

Project impacts related to increased community risk can occur either by generating emissions of TACs and air pollutants and by introducing a new sensitive receptor in proximity to an existing source of TACs. Temporary project construction activity would generate emissions of DPM from equipment and trucks and also generate dust on a temporary basis that could affect nearby sensitive receptors. A construction community health risk assessment was prepared to address project construction impacts on the surrounding off-site sensitive receptors.

Additionally, the project could introduce new residents that are sensitive receptors, who would be exposed to existing sources of TACs and localized air pollutants in the vicinity of the project. Therefore, the impact of the existing sources of TAC upon the existing sensitive receptors and new incoming sensitive receptors was assessed.

Community risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust emissions pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[6] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated. The methodology for computing community risks impacts is contained in *Attachment 1*.

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative emissions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMission FACtors 2017 (EMFAC2017) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[7] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2017 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

Land Use Inputs

The proposed residential land uses were entered into CalEEMod as described in Table 2.

[6] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.
[7] See CARB's EMFAC2017 Web Database at https://www.arb.ca.gov/emfac/2017/

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Apartments Mid Rise	49	Dwelling Unit	55,700	0.63
Enclosed Parking Structure	64	Space	22,454	

Construction Inputs

CalEEMod computes annual emissions for construction that are based on the project type, size, and acreage. The model provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction build-out scenario for both phases, including equipment list and schedule, were based on information provided by the project applicant.

The construction equipment worksheets provided by the applicant included the schedule for each phase. Within each phase, the quantity of equipment to be used, the average hours per day, and total number of workdays were provided by the applicant. Since different equipment would have different estimates of the working days per phase, the hours per day for each phase was computed by dividing the total number of hours that the equipment would be used by the total number of days in that phase. The construction schedule assumed that the earliest possible start date would be January 2022, project construction would be five-days a week, and the project would be built out over a period of approximately 15 months. For modeling purposes, a condensed schedule of 10 months and 165 construction workdays was utilized to minimize periods of no construction activity within phases and increase resulting concentrations. The earliest year of full operation was assumed to be 2023.

Construction Truck Traffic Emissions

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2014 motor vehicle emission factor model. This model has been superseded by the EMFAC2017 model; however, CalEEMod has not been updated to include EMFAC2017. Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the estimate of demolition material to be exported, soil material imported and/or exported to the site, and the estimate of cement and asphalt truck trips. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. The total trips for those were computed by multiplying the daily trip rate by the number of days in that phase. Haul trips for demolition and grading were estimated from the provided demolition and grading volumes. The number of concrete total round haul trips were provided for the project and converted to total one-way trips, assuming two trips per delivery.

The construction traffic information was combined with EMFAC2017 motor vehicle emissions factors. EMFAC2017 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod default assumptions, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1and LDT2). Vendor trips are comprised of delivery and large trucks

(EMFAC category MHDT and HHDT) and haul trips, including cement trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (demolition material export and soil import/export). Since CalEEMod does not address cement trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On road emissions in San Mateo County for 2022 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2017 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2017 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	62.6% LDA 8.8% LDT1 28.5% LDT2	77.2% MHDT 22.8% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Cement)	CalEEMod default distance with 5-min truck idle time.
Demolition	40	-	67	3,798-sf of existing building and 11,000-sf of existing pavement demolition. CalEEMod default worker trips.
Site Preparation	15	-	-	CalEEMod default worker trips.
Grading	120	-	922	7,225-cy soil export. 150-cy soil import. CalEEMod default worker trips.
Trenching	60	-	-	CalEEMod default worker trips.
Building Construction	2,475	495	178	89 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	540	-	-	CalEEMod default worker trips.
Paving	8	-	-	CalEEMod default worker trips.

Notes: [1] Based on 2022 EMFAC2017 light-duty vehicle fleet mix for San Mateo County.
[2] Includes grading trips estimated by CalEEMod based on amount of material to be removed.

Summary of Computed Construction Period Emissions

The CalEEMod model and EMFAC2017 emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.0199 tons (40 pounds) before recommended CoA, and 0.0062 tons (12 pounds) after recommended CoA. The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were

calculated by CalEEMod as 0.0045 tons (9 pounds) before recommended CoA, and 0.0021 tons (4 pounds) after recommended CoA for the overall construction period.

Community Health Risk from Project Construction

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at sensitive receptors in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[8]

Construction Sources

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[9] The release height incorporates both the physical release height from the construction equipment (i.e., the height of the exhaust pipe) and plume rise after it leaves the exhaust pipe. Plume rise is due to both the high temperature of the exhaust and the high velocity of the exhaust gas. It should be noted that when modeling an area source, plume rise is not calculated by the AERMOD dispersion model as it would do for a point source (exhaust stack). Therefore, the release height from an area source used to represent emissions from sources with plume rise, such as construction equipment, should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe.

For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 7 feet (2 meters) was used for the area source. Fugitive dust emissions at construction sites come from a variety of sources, including truck and equipment travel, grading activities, truck loading (with loaders) and unloading (rear or bottom dumping), loaders and excavators moving and transferring soil and other materials, etc. All of these activities result in fugitive dust emissions at various heights at the point(s) of generation. Once generated, the dust plume will tend to rise as it moves downwind across the site and exit the site at a higher elevation than when it was generated. For all these reasons, a 7-foot release height was used as the average release height across the construction site. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources.

AERMOD Inputs and Meteorological Data

The modeling used a five-year data set (2013 – 2017) of hourly meteorological data from the San Francisco International Airport prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring daily between 7:00 a.m. to 4:00 p.m., when it was assumed the majority of construction activity would occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the year 2022 were calculated using the model.

[8] Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May.

[9] California Air Resource Board, 2007. *Proposed Regulation for In-Use Off-Road Diesel Vehicles, Appendix D: Health Risk Methodology.* April. Web: https://ww3.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm

DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters), 15 feet (4.5 meters), and 25 feet (7.6 meters) were used to represent the breathing height on the first, second, and third floors of nearby multi-story residences.[10]

Summary of Construction Community Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the Office of Environmental Health Hazard Assessment (OEHHA) guidance for age sensitivity factors and exposure parameters as recommended by BAAQMD (see *Attachment 1)*. Non-cancer health hazards and maximum $PM_{2.5}$ concentrations were also calculated and identified. Age-sensitivity factors reflect the greater sensitivity of third trimester, infants, and small children to cancer causing TACs. Third trimester, infant, child, and adult exposures were assumed to occur at all residences during the entire construction period.

The maximum modeled annual $PM_{2.5}$ concentration was calculated based on combined exhaust and fugitive concentrations. The maximum computed HI value was based on the ratio of the maximum DPM concentration modeled and the chronic inhalation refence exposure level of 5 $\mu g/m^3$.

The maximum-modeled annual DPM and $PM_{2.5}$ concentrations, which includes both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction residential MEI was located on the second floor of the apartment building east of the project site. Table 4 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Additionally, modeling was conducted to predict the cancer risks, non-cancer health hazards, and maximum $PM_{2.5}$ concentrations associated with construction activities at the nearby early child development center and middle school. The maximum increased cancer risks were adjusted using infant and child exposure parameters. The uncontrolled cancer risk, $PM_{2.5}$ concentration, and HI at the nearby early child development center and middle school do not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 4.

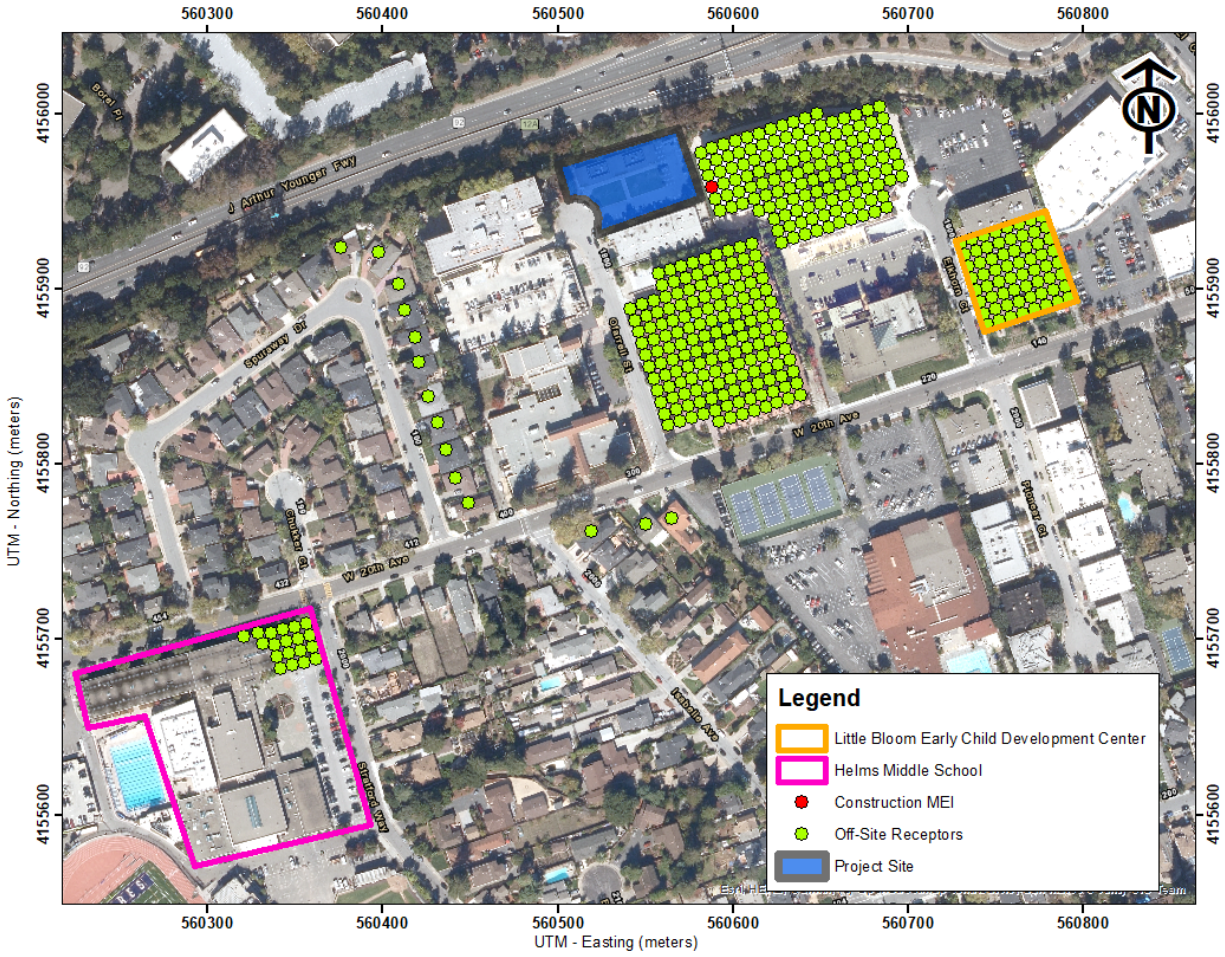
[10] Bay Area Air Quality Management District, 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0. May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

Table 4. Construction Risk Impacts at the Off-site MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Without COA	**18.8 (infant)**	0.10	0.01
	With COA*	5.9 (infant)	0.04	<0.01
BAAQMD Single-Source Threshold		***10.0***	***0.3***	***1.0***
Exceed Threshold?	Without COA	***Yes***	*No*	*No*
	With COA*	*No*	*No*	*No*
Most Affected Nearby School – Little Bloom Early Child Development Center				
Project Construction	Without COA	5.1 (infant)	0.01	<0.01
BAAQMD Single-Source Threshold		***10.0***	***0.3***	***1.0***
Exceed Threshold?	Without COA	*No*	No	No

* Construction equipment with Tier 4 interim engines and Best Management Practices as recommended CoA.

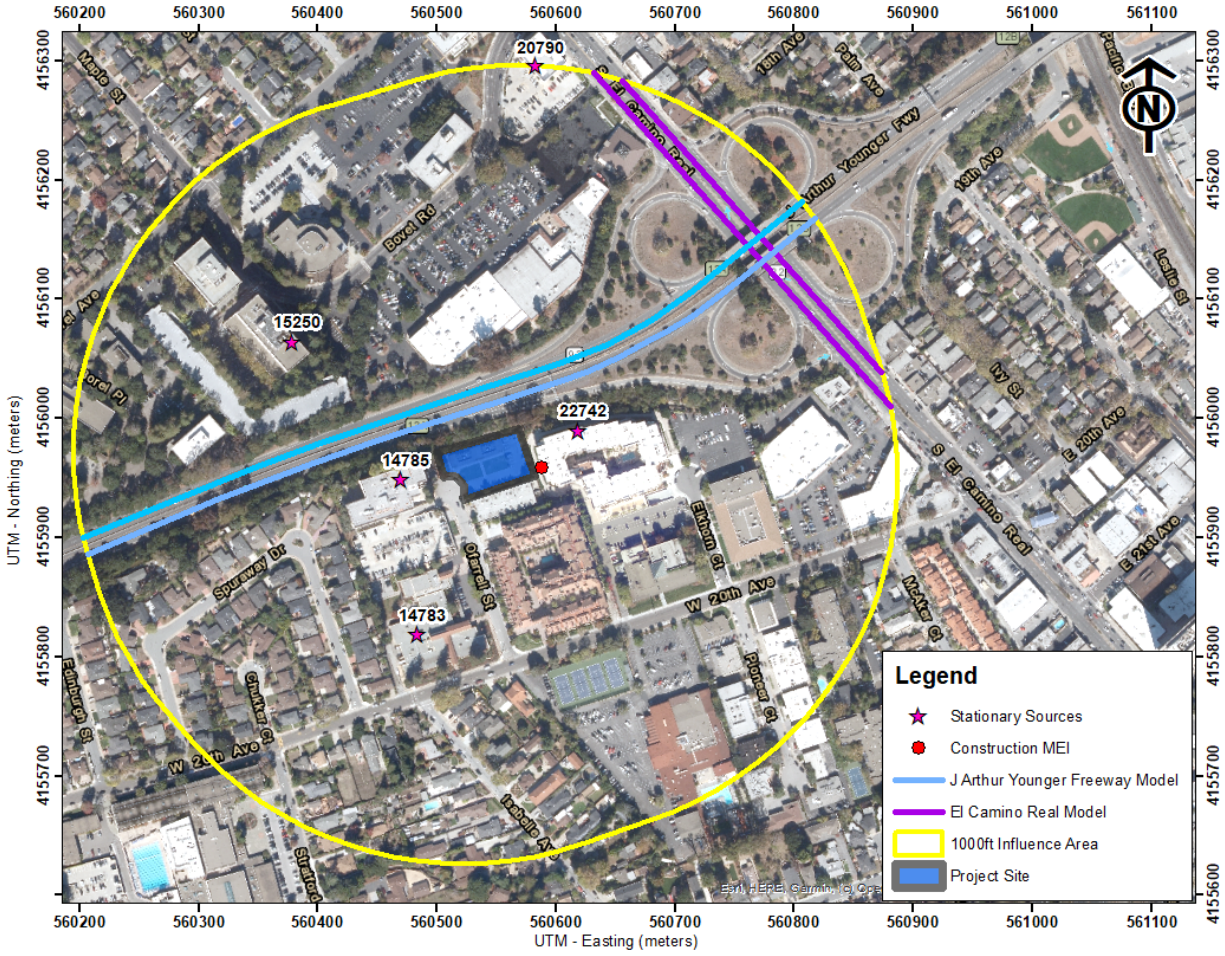
Figure 1. Project Construction Site, Locations of Off-Site Sensitive Receptors, and Maximum TAC Impact Location



Cumulative Community Risks of all TAC Sources at the Offsite Project MEI

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site (i.e., influence area). These sources include rail lines, highways, busy surface streets, and stationary sources identified by BAAQMD. A review of the project influence area based on provided information indicates that traffic on J Arthur Younger Freeway (State Route 92) and El Camino Real (State Route 82) would exceed an average daily traffic (ADT) of 10,000 vehicles. A review of BAAQMD's stationary source geographic information systems (GIS) map tool[11] identified five stationary sources with the potential to affect the project site and MEI. Figure 2 shows the location of sources affecting the project site and MEI. Community risk impacts from these sources upon the MEI reported in Table 5. Details of the modeling and community risk calculations are included in *Attachment 5*.

Figure 2. Project Site and Nearby TAC and $PM_{2.5}$ Sources



[11] BAAQMD, *Permitted Stationary Sources Risk and Hazards*, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65

State Routes – J Arthur Younger Freeway (S.R. 92) & El Camino Real (S.R. 82)

The project site and construction MEI are located near State Routes (S.R.) 92 and 82. A refined analysis of the impacts of TACs and $PM_{2.5}$ from both routes on the project site and MEI receptor are necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from S.R. 92 and S.R. 82. A review of the traffic information reported by the California Department of Transportation (Caltrans) indicates that S.R. 92 traffic includes 80,000 vehicles per day (based on an annual average)[12] that are about 2.3 percent trucks, of which 0.9 percent are considered diesel heavy duty trucks and 1.4 percent are medium duty trucks.[13] For S.R. 82, a review of the same information indicates that S.R. 82 traffic includes 38,400 vehicles per day (based on an annual average)[11] that are about 1.3 percent trucks, of which 0.3 percent are considered diesel heavy duty trucks and 1.0 percent are medium duty trucks.[12]

Traffic Emissions Modeling

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on both highways using the Caltrans version of the EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (e.g., TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included in these emissions. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (i.e., San Mateo County), type of road (i.e., freeway), traffic mix assigned by CT-EMFAC2017 for the county and adjusted for the local truck mix on each highway, year of analysis (2023 – project operational year), and season (i.e., annual).

In order to estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating increased cancer risks to the MEI from traffic on S.R. 92 and S.R. 82, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2023 (project operational year) using the calculated mix of cars and trucks on each route. Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CT-EMFAC2017. Year 2023 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years), since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions will decrease in the future.

Average daily traffic volumes and truck percentages were based on Caltrans data for S.R. 92 and S.R. 82. Traffic volumes were assumed to increase 1 percent per year. Hourly traffic distributions specific to these segments of S.R. 92 and S.R. 82 were obtained from Caltrans Performance Measurement System (PeMS). PeMS data is collected in real-time from nearly 40,000 individual

[12] Caltrans. 2021. *2019 Traffic Volumes California State Highways.*
[13] Caltrans. 2021. *2018 Annual Average Daily Truck Traffic on the California State Highway System*

detectors spanning the freeway system across all major metropolitan areas of California.[14] The fraction of traffic volume each hour was calculated and applied to the 2023 average daily traffic volumes estimate to estimate hourly traffic emission rates for S.R. 92 and S.R. 82.

For all hours of the day, an average speed of 55 mph was assumed for all vehicles on S.R. 92 based on posted speed limit signs on the highway. For all hours of the day, other than during peak a.m. and p.m. periods, an average speed of 35 mph was assumed for all vehicles on S.R. 82 based on posted speed limit signs on the highway. Traffic speeds during the peak a.m. and p.m. periods on S.R. 82 were assumed to be 10 miles per hour slower (i.e., 25 mph) to account for congestion and the amount of access in the area.

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for future traffic on S.R. 92 and S.R. 82 and used these emissions with an air quality dispersion model to calculate TAC and $PM_{2.5}$ concentrations at the project MEI receptor location. Maximum increased lifetime cancer risks and annual $PM_{2.5}$ concentrations for the receptor was then computed using modeled TAC and $PM_{2.5}$ concentrations and BAAQMD methods and exposure parameters described in *Attachment 1*.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD air quality dispersion model, which is recommended by the BAAQMD for this type of analysis.[15] TAC and $PM_{2.5}$ emissions from traffic on S.R. 92 and S.R. 82 driving within 1,000 feet of the project site were evaluated. Vehicle traffic on the roadway was modeled using a series of adjacent volume sources along a line (line volume sources); with line segments used for the travel directions on the highways. The same meteorological data and off-site sensitive receptors used in the previous construction dispersion modeling were used in the highway modeling. Other inputs to the model included road geometry and elevations, hourly traffic emissions, and receptor locations. Roadway and receptor elevations were based on USGS National Elevation Data (NED) with a 10-meter resolution. Annual TAC and $PM_{2.5}$ concentrations for 2023 from traffic on S.R. 92 and S.R. 82 were calculated using the model. Concentrations were calculated at the construction MEI with receptor heights of 15 feet (4.5 meters) to represent the breathing heights on the second floor of residents in the multi-story apartment buildings nearby.

Computed Cancer and Non-Cancer Health Impacts

The cancer risk, $PM_{2.5}$ concentration, and HI impacts from S.R. 92 and S.R. 82 on the construction MEI are shown in Table 5. Figure 2 shows the highway links used for the modeling and MEI location where concentrations were calculated. Details of the S.R. 92 and S.R. 82 traffic emission calculations, dispersion modeling, and cancer risk calculations for the construction MEI are provided in *Attachment 5.*

[14] https://dot.ca.gov/programs/traffic-operations/mpr/pems-source
[15] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website.[16] This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. Five sources were identified using this tool with all five sources being diesel generators. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided input and clarification about the stationary sources.[17] After further review and confirmation from BAAQMD,[18] source #14785 was found to be located at another address not near the project site and would, therefore, not present any risk or hazard impacts at the site. The locations and effects of the other four sources were confirmed.

The screening average daily emissions for the four sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines*. Community risk impacts from the stationary sources upon the MEIs are reported in Table 5.

Summary of Cumulative Health Risk Impact at Construction MEI

Table 5 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e., the MEI). The project would have an exceedance with respect to community risk caused by project construction activities, since the maximum before CoA cancer risk exceeds the BAAQMD single-source thresholds. With the implementation of *Recommended Conditions of Approval (CoA) AQ-1 and AQ-2*, the project's cancer risks would be lowered to a level below the single-source thresholds. The cancer risk and $PM_{2.5}$ concentration would not exceed the cumulative-source threshold.

[16] BAAQMD, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65
[17] Correspondence with Areana Flores, MSc, Environmental Planner, BAAQMD, April 8, 2021.
[18] Correspondence with Matthew Hanson, Environmental Planner, BAAQMD, April 27, 2021.

Table 5. Impacts from Combined Sources at Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Project Construction	Without CoA	**18.8 (infant)**	0.10	0.01
	With CoA	5.9 (infant)	0.04	<0.01
BAAQMD Single-Source Threshold		***10.0***	***0.3***	***1.0***
Exceed Threshold?	Without CoA	***Yes***	*No*	*No*
	With CoA	*No*	*No*	*No*
Cumulative Sources				
J Arthur Younger Freeway (S.R. 92), ADT 83,201		5.2	0.46	<0.01
El Camino Real (S.R. 82), ADT 39,936		0.3	0.03	<0.01
City of San Mateo City Hall (Facility ID #14783, Generators), MEI 560 feet		0.1	<0.01	<0.01
Casiopea Bovet LLC (Facility ID #15250, Generators), MEI 830 feet		0.04	<0.01	<0.01
1730 S El Camino Real Partners LP (Facility ID #20790, Generators), MEI 1000+ feet		0.1	<0.01	<0.01
Park 20 (Facility ID #22742, Generators), MEI 50 feet		0.3	<0.01	<0.01
Combined Sources	Without CoA	24.84 (infant)	<0.63	<0.07
	With CoA	11.94 (infant)	<0.57	<0.07
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Without CoA	*No*	*No*	*No*
	With CoA	*No*	*No*	*No*

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. *Recommended Measure AQ-1 would implement BAAQMD-recommended best management practices*.

Recommended Measure AQ-1: **Include measures to control dust and exhaust during construction.**

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less-than-significant level. Additional measures are identified to reduce construction equipment exhaust emissions. The contractor shall implement the following best management practices that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-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.

4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. 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.

6. 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.

7. 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.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Effectiveness of Recommended Measure AQ-1

The measures above are consistent with BAAQMD-recommended basic control measures for reducing fugitive particulate matter that are contained in the BAAQMD CEQA Air Quality Guidelines.

Recommended Condition of Approval AQ-2: **Use construction equipment that has low diesel particulate matter exhaust emissions.**

A feasible plan to reduce emissions such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below significance levels is as follows:

1. All construction equipment larger than 25 horsepower used at the site for more than two continuous days or 20 hours total shall meet U.S. EPA Tier 4 emission standards for particulate matter (PM_{10} and $PM_{2.5}$), if feasible, otherwise,

    a. Equipment that meets U.S. EPA emission standards for Tier 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve a 50 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment could be used; alternatively (or in combination),

b. Use of electrical or non-diesel fueled equipment.

2. Alternatively, the applicant could develop a separate feasible plan that reduces on- and near-site construction diesel particulate matter emissions by 50 percent or greater. Such a plan would have to be reviewed and approved by the City.

Effectiveness of Recommended Condition of Approval AQ-2

CalEEMod was used to compute emissions associated with this CoA measure assuming that all equipment met U.S. EPA Tier 4 interim engines standards and BAAQMD best management practices for construction were included. With these implemented, the project's construction cancer risk impact, assuming infant exposure, would be reduced to 5.9 per million. As a result, the project's construction cancer risk would be reduced below the BAAQMD single-source threshold.

On-Site Community Health Risk Impacts – New Project Residents

In addition to evaluating health impact from project construction, a health risk assessment was completed to assess the impact existing TAC sources would have on the new proposed sensitive receptors (residents) that that project would introduce. The same TAC sources identified above were used in this health risk assessment.[19]

State Routes – J Arthur Younger Freeway (S.R. 92) & El Camino Real (S.R. 82)

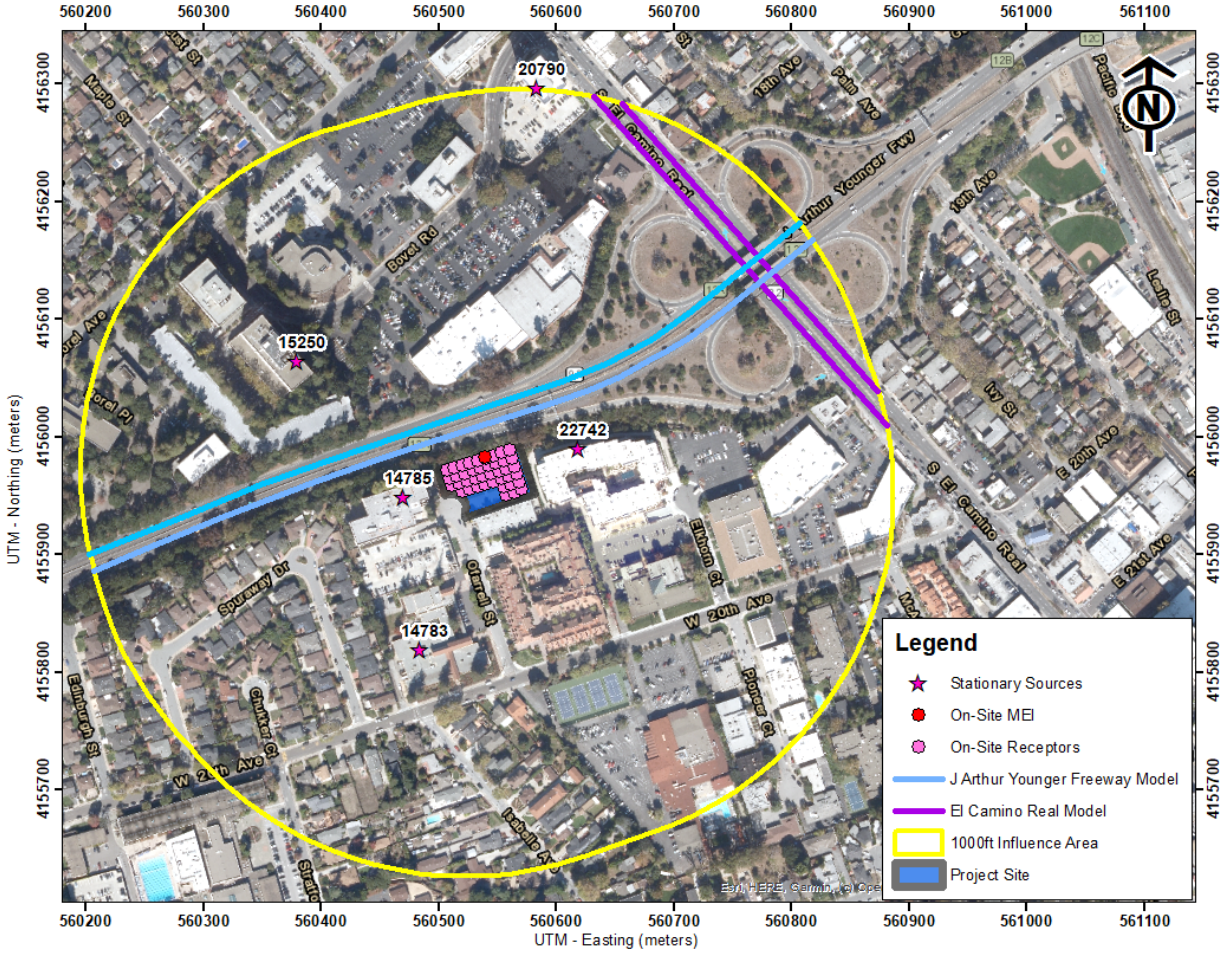
The highway analysis for the new project residents was conducted in the same manner as described above for the off-site MEI. The project set of receptors were placed throughout the project area and were spaced every 23 feet (7 meters). Highway impacts were modeled at receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) representing sensitive receptors on the first and second floors. Project sensitive receptors higher than the second floor would have highway impacts less than those on the second floor. The portions of S.R. 92 and S.R. 82 included in the modeling are shown in Figure 3 along with the project site and receptor locations where impacts were modeled.

Maximum increased cancer risks were calculated for the residents at the project site using the maximum modeled TAC concentrations. A 30-year exposure period was used in calculating cancer risks assuming the residents would include third trimester pregnancy and infants/children and were assumed to be in the new housing area for 24 hours per day for 350 days per year. The maximum impacts from S.R. 92 and S.R. 82 occurred at a first-floor receptor along the northern boundary of the project site closest to the roadway. Cancer risks associated with S.R. 92 and S.R. 82 are greatest closest to S.R. 92 and decrease with distance from the highway. S.R. 82 has a minimal effect on the total cancer risk given its distance to the project site. The highway community risk impacts at

[19] We note that to the extent this analysis considers *existing* air quality issues in relation to the impact on *future residents* of the Project, it does so for informational purposes only pursuant to the judicial decisions in *CBIA v. BAAQMD* (2015) 62 Cal.4th 369, 386 and *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473, which confirm that the impacts of the environment on a project are excluded from CEQA unless the project itself "exacerbates" such impacts.

the project site are shown in Table 6. Risk values were computed using modeled DPM and $PM_{2.5}$ concentrations and BAAQMD recommended methods and exposure parameters described in *Attachment 1*. Details of the emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5*.

Figure 3. Project Site, On-Site Residential Receptors, Roadway Segments Evaluated, and Locations of Maximum Roadway TAC Impacts



BAAQMD Stationary Sources

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. Table 6 shows the risk impacts from the stationary sources on the project receptors.

Combined Community Health Risk at Project Site

Community risk impacts from the existing TAC sources upon the project site are reported in Table 6. The risks from the singular TAC sources are compared against the BAAQMD single-source threshold. The risks from all the sources are then combined and compared against the BAAQMD cumulative-source threshold. As shown, the HI and cancer risk from the nearby sources does not

exceed their single-source or cumulative-source thresholds. However, before CoA annual $PM_{2.5}$ concentrations are estimated to exceed their respective single-source and cumulative-source thresholds due to emissions from S.R. 92.

Table 6. Cumulative Community Risk Impacts Upon the On-site Sensitive Receptors

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
J Arthur Younger Freeway (S.R. 92), ADT 83,201				
	Without CoA	8.28	**0.78**	<0.01
	With CoA	5.11	0.24	<0.01
El Camino Real (S.R. 82), ADT 39,936		0.17	0.01	<0.01
City of San Mateo City Hall (Facility ID #14783, Generators), MEI 560 feet		0.09	<0.01	<0.01
Casiopea Bovet LLC (Facility ID #15250, Generators), MEI 830 feet		0.07	<0.01	<0.01
1730 S El Camino Real Partners LP (Facility ID #20790, Generators), MEI 1000+ feet		0.08	<0.01	<0.01
Park 20 (Facility ID #22742, Generators), MEI 50 feet		0.16	<0.01	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?		*No*	***Yes***	*No*
Cumulative Total	Without CoA	*8.85*	***<0.83***	<0.07
	With CoA	*5.68*	<0.29	<0.07
BAAQMD Cumulative Source Threshold		***>100***	***>0.8***	***>10.0***
Exceed Threshold?	Without CoA	*No*	***Yes***	*No*
	With CoA	*No*	*No*	*No*

Recommended Design Features to Reduce Project Receptor Exposure

Filtration in ventilation systems at the project site would be recommended to reduce the level of harmful pollutants to below the significant thresholds. The significant exposure for new project receptors is judged by two effects: (1) increased cancer risk, and (2) annual $PM_{2.5}$ concentration. Exposure to annual $PM_{2.5}$ concentrations from S.R. 92 are above the thresholds. These annual $PM_{2.5}$ concentrations are based on the exposure to $PM_{2.5}$ resulting from emissions attributable to truck and auto exhaust, the wearing of brakes and tires and re-entrainment of roadway dust from vehicles traveling over pavement. The modeled $PM_{2.5}$ exposure to future residents drives the CoA. Reducing particulate matter exposure would reduce both annual $PM_{2.5}$ exposures and cancer risk.

The project shall include the following measures to minimize long-term increased cancer risk and annual $PM_{2.5}$ exposure for new project occupants:

1. Install air filtration for the entire residential building. Air filtration devices shall be rated MERV13 or higher. To ensure adequate health protection to sensitive receptors (i.e., residents), this ventilation system, whether mechanical or passive, shall filter all fresh air that would be circulated into the dwelling units.

2. The ventilation system shall be designed to keep the building at positive pressure when doors and windows are closed to reduce the intrusion of unfiltered outside air into the building

3. As part of implementing this measure, an ongoing maintenance plan for the buildings' heating, ventilation, and air conditioning (HVAC) air filtration system shall be required that includes regular filter replacement.

4. Ensure that the use agreement and other property documents: (1) require cleaning, maintenance, and monitoring of the affected buildings for air flow leaks, (2) include assurance that new owners or tenants are provided information on the ventilation system, and (3) include provisions that fees associated with owning or leasing a unit(s) in the building include funds for cleaning, maintenance, monitoring, and replacements of the filters, as needed.

Effectiveness of Recommended Design Features

A properly installed and operated ventilation system with MERV13 would achieve an 80-percent reduction for small particulates.[20] The overall effectiveness calculations take into account the amount of time spent outdoors and away from home. Assuming that the filtration system is 80-percent effective and the individual is being exposed to 21 hours of indoor filtered air and three hours of outdoor unfiltered air, then the overall effectiveness of a MERV13 filtration system would be about 70-percent for $PM_{2.5}$ exposure. For S.R. 92, this would reduce the maximum annual $PM_{2.5}$ concentration to 0.24 $\mu g/m^3$. With this recommended design feature, impacts from S.R. 92 would be below their respective single- and cumulative-source thresholds.

[20] Bay Area Air Quality Management District (2016). Appendix B: Best Practices to Reduce Exposure to Local Air Pollution, *Planning Healthy Places A Guidebook for Addressing Local Sources of Air Pollutants in Community Planning* (p. 38). http://www.baaqmd.gov/~/media/files/planning-and-research/planning-healthy-places/php_may20_2016-pdf.pdf?la=en

Supporting Documentation

Attachment 1 is the methodology used to compute community risk impacts, including the methods to compute lifetime cancer risk from exposure to project emissions.

Attachment 2 includes the CalEEMod output for project construction emissions. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2017 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

Attachment 4 is the construction health risk assessment. This includes the summary of the dispersion modeling and the cancer risk calculations for construction. AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format

Attachment 5 includes the cumulative community risk calculations, modeling results, and health risk calculations from sources affecting the construction MEI and project site receptors.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[21] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[22] This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[23] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs is calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency and duration of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) or liters per kilogram of body weight per 8-hour period for the case of worker or school child exposures. As recommended by the BAAQMD for residential exposures, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. For children at schools and daycare facilities, BAAQMD recommends using the 95th percentile 8-hour breathing rates. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of

[21] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.
[22] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[23] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults, a 25-year exposure period is recommended by the BAAQMD. For school children a 9-year exposure period is recommended by the BAAQMD.

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR^* \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
8HrBR = 8-hour breathing rate (L/kg body weight-8 hours)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized as follows:

Parameter	*Exposure Type* →	Infant		Child	Adult
	Age Range →	3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80th Percentile Rate		273	758	572	261
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate		-	1,200	520	240
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14*
Exposure Frequency (days/year)		350	350	350	350*
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home (FAH)		0.85-1.0	0.85-1.0	0.72-1.0	0.73*
* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.					

Non-Cancer Hazards

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 2: CalEEMod Modeling Inputs and Outputs

Air Quality/Noise Construction Information Data Request

Project Name: 1919 O'Farrell

See Equipment Type TAB for type, horsepower and load factor

Complete ALL Portions in Yellow

Project Size	49	Dwelling Units	0.63 total project acres disturbed
	55700	s.f. residential	
	N/A	s.f. retail	
	N/A	s.f. office/commercial	
		s.f. other, specify:	
	22454	s.f. parking garage	64 spaces
	N/A	s.f. parking lot	N/A spaces
Construction Hours	7 am	to	4 pm

Pile Driving? Y/N? NO

Project include OPERATIONAL GENERATOR OR FIRE PUMP on-site? Y/N? _N___

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower: _____

Fuel Type: _____

Location in project (Plans Desired if Available):

DO NOT MULTIPLY EQUIPMENT HOURS/DAY BY THE QUANTITY OF EQUIPMENT

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	HP Annual Hours	Comments
	Demolition	**Start Date:**	**1/3/2022**	**Total phase:**	**8**			**Overall Import/Export Volumes**
		End Date:	**7/1/2023**					
	Concrete/Industrial Saws	81	0.73			0	0	**Demolition Volume**
1	Excavators	158	0.38	8	8	8	3843	Square footage of buildings to be demolished
	Rubber-Tired Dozers	247	0.4			0	0	(*or* total tons to be hauled)
1	Tractors/Loaders/Backhoes	97	0.37	8	8	8	2297	**_14798_** square feet *or*
	Other Equipment?							**_?_** Hauling volume (tons)
								Any pavement demolished and hauled? **_TBD_ tons**
	Site Preparation	**Start Date:**	**1/17/2022**	**Total phase:**	**5**			
		End Date:	**1/24/2022**					
1	Graders	187	0.41	8	5	8	3067	
	Rubber Tired Dozers	247	0.4			0	0	
	Tractors/Loaders/Backhoes	97	0.37			0	0	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**1/24/2022**	**Total phase:**	**15**			
		End Date:	**2/21/2022**					**Soil Hauling Volume**
2	Excavators	158	0.38	8	15	8	14410	Export volume = **_7,225_** cubic yards?
	Graders	187	0.41			0	0	Import volume = **_150_** cubic yards?
	Rubber Tired Dozers	247	0.4			0	0	
	Concrete/Industrial Saws	81	0.73			0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8	15	8	4307	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**2/22/2022**	**Total phase:**	**20**			
		End Date:	**4/18/2022**					
1	Tractor/Loader/Backhoe	97	0.37	3	20	3	2153	
	Excavators	158	0.38			0	0	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**4/22/2022**	**Total phase:**	**55**			**Cement Trucks? _178_ Total Round-Trips**
		End Date:	**4/20/2023**					
1	Cranes	231	0.29	5	15	1.36363636	5024	Electric? (Y/N) _N_ Otherwise assumed diesel
1	Forklifts	89	0.2	5	55	5	4895	Liquid Propane (LPG)? (Y/N) _N__ Otherwise Assumed diesel
	Generator Sets	84	0.74			0	0	Or temporary line power? (Y/N) ___TEMPPORARY POWER
	Tractors/Loaders/Backhoes	97	0.37			0	0	
1	Welders	46	0.45	3	25	1.36363636	1553	
	Other Equipment?							
	Building - Interior/Architectural Coating	**Start Date:**	**8/1/2022**	**Total phase:**	**60**			
		End Date:	**11/15/2022**					
3	Air Compressors	78	0.48	5	60	5	33696	
	Aerial Lift	62	0.31			0	0	
	Other Equipment?							
	Paving	**Start Date:**	**6/1/2022**	**Total phase:**	**2**			
		Start Date:	**6/8/2022**					
	Cement and Mortar Mixers	9	0.56			0	0	
	Pavers	130	0.42			0	0	**Asphalt? _0__ cubic yards or ____ round trips?**
1	Paving Equipment	132	0.36	6	2	6	570	
1	Rollers	80	0.38	3	1	1.5	91	
1	Tractors/Loaders/Backhoes	97	0.37	3	2	3	215	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	

Equipment types listed in "Equipment Types" worksheet tab.

Equipment listed in this sheet is to provide an example of inputs

It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate

Modify horsepower or load factor, as appropriate

Complete one sheet for each project component

1919 O'Farrell St

San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking Structure	64.00	Space	0.00	22,454.00	0
Apartments Mid Rise	49.00	Dwelling Unit	0.63	55,700.00	140

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and Square footage provided by client

Construction Phase - Construction phases and durations provided by client

Off-road Equipment - Demolition equipment and hours provided by client

Off-road Equipment - Architectural coating equipment and hours provided by client

Off-road Equipment - Building construction equipment and hours provided by client

Off-road Equipment - Demolition equipment and hours provided by client

Off-road Equipment - Grading equipment and hours provided by client

Off-road Equipment - Paving equipment and hours provided by client

Off-road Equipment - Site Prep equipment and duration provided by client

Off-road Equipment - Trenching equipment and hours provided by client

Trips and VMT - Trips entered into EMFAC2017 spreadsheet

Demolition - Building demolition = 3,798 sqft (provided), pavement demolition = 11,000 sqft (estimated viaGoogle Earth)

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - All equipment t4i

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	5.00	60.00
tblConstructionPhase	NumDays	100.00	55.00
tblConstructionPhase	NumDays	10.00	8.00

tblConstructionPhase	NumDays	2.00	15.00
tblConstructionPhase	NumDays	5.00	2.00
tblConstructionPhase	NumDays	1.00	5.00
tblFleetMix	FleetMixLandUseSubType	Enclosed Parking Structure	Apartments Mid Rise
tblFleetMix	FleetMixLandUseSubType	Apartments Mid Rise	Enclosed Parking Structure
tblGrading	MaterialExported	0.00	7,225.00
tblGrading	MaterialImported	0.00	150.00
tblLandUse	BuildingSpaceSquareFeet	25,600.00	22,454.00
tblLandUse	BuildingSpaceSquareFeet	49,000.00	55,700.00
tblLandUse	LandUseSquareFeet	25,600.00	22,454.00
tblLandUse	LandUseSquareFeet	49,000.00	55,700.00
tblLandUse	LotAcreage	0.58	0.00
tblLandUse	LotAcreage	1.29	0.63
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	1.40
tblOffRoadEquipment	UsageHours	6.00	5.00
tblOffRoadEquipment	UsageHours	7.00	1.50
tblOffRoadEquipment	UsageHours	7.00	3.00
tblOffRoadEquipment	UsageHours	6.00	5.00
tblProjectCharacteristics	OperationalYear	2018	2024
tblTripsAndVMT	HaulingTripNumber	67.00	0.00
tblTripsAndVMT	HaulingTripNumber	922.00	0.00
tblTripsAndVMT	VendorTripNumber	9.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00

tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	45.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	9.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	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
Year	tons/yr										MT/yr					
2022	0.4400	0.3698	0.4559	7.3000e-004	0.0147	0.0197	0.0343	4.4100e-003	0.0187	0.0232	0.0000	62.9316	62.9316	0.0135	0.0000	63.2699
Maximum	**0.4400**	**0.3698**	**0.4559**	**7.3000e-004**	**0.0147**	**0.0197**	**0.0343**	**4.4100e-003**	**0.0187**	**0.0232**	**0.0000**	**62.9316**	**62.9316**	**0.0135**	**0.0000**	**63.2699**

Mitigated Construction

	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
Year	tons/yr										MT/yr					
2022	0.4171	0.3113	0.4844	7.3000e-004	6.6000e-003	6.0000e-003	0.0126	1.9900e-003	5.7400e-003	7.7300e-003	0.0000	62.9315	62.9315	0.0135	0.0000	63.2698
Maximum	**0.4171**	**0.3113**	**0.4844**	**7.3000e-004**	**6.6000e-003**	**6.0000e-003**	**0.0126**	**1.9900e-003**	**5.7400e-003**	**7.7300e-003**	**0.0000**	**62.9315**	**62.9315**	**0.0135**	**0.0000**	**63.2698**

	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	N20	CO2e
Percent Reduction	**5.21**	**15.81**	**-6.25**	**0.00**	**55.01**	**69.47**	**63.29**	**54.88**	**69.37**	**66.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-3-2022**	**4-2-2022**	0.1784	0.1597
2	**4-3-2022**	**7-2-2022**	0.3304	0.2891
3	**7-3-2022**	**9-30-2022**	0.2959	0.2745
		Highest	0.3304	0.2891

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	0.3827	6.8000e-003	0.5200	3.3000e-004		0.0243	0.0243		0.0243	0.0243	2.2339	1.5130	3.7469	4.1600e-003	1.5000e-004	3.8947
Energy	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903
Mobile	0.0673	0.1892	0.7547	2.7300e-003	0.2728	2.1800e-003	0.2750	0.0733	2.0300e-003	0.0753	0.0000	250.3979	250.3979	8.9300e-003	0.0000	250.6211
Waste						0.0000	0.0000		0.0000	0.0000	4.5754	0.0000	4.5754	0.2704	0.0000	11.3354
Water						0.0000	0.0000		0.0000	0.0000	1.0129	0.0000	1.0129	0.1040	2.4600e-003	4.3456
Total	**0.4531**	**0.2218**	**1.2856**	**3.2200e-003**	**0.2728**	**0.0286**	**0.3013**	**0.0733**	**0.0284**	**0.1017**	**7.8222**	**281.8234**	**289.6456**	**0.3881**	**3.1600e-003**	**300.2870**

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	0.3827	6.8000e-003	0.5200	3.3000e-004		0.0243	0.0243		0.0243	0.0243	2.2339	1.5130	3.7469	4.1600e-003	1.5000e-004	3.8947
Energy	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903
Mobile	0.0673	0.1892	0.7547	2.7300e-003	0.2728	2.1800e-003	0.2750	0.0733	2.0300e-003	0.0753	0.0000	250.3979	250.3979	8.9300e-003	0.0000	250.6211
Waste						0.0000	0.0000		0.0000	0.0000	4.5754	0.0000	4.5754	0.2704	0.0000	11.3354
Water						0.0000	0.0000		0.0000	0.0000	1.0129	0.0000	1.0129	0.1040	2.4600e-003	4.3456
Total	**0.4531**	**0.2218**	**1.2856**	**3.2200e-003**	**0.2728**	**0.0286**	**0.3013**	**0.0733**	**0.0284**	**0.1017**	**7.8222**	**281.8234**	**289.6456**	**0.3881**	**3.1600e-003**	**300.2870**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/3/2022	1/12/2022	5	8	
2	Site Preparation	Site Preparation	1/13/2022	1/19/2022	5	5	
3	Grading	Grading	1/20/2022	2/9/2022	5	15	
4	Trenching	Trenching	2/10/2022	3/9/2022	5	20	
5	Building Construction	Building Construction	3/10/2022	5/25/2022	5	55	
6	Paving	Paving	5/26/2022	5/27/2022	5	2	
7	Architectural Coating	Architectural Coating	5/28/2022	8/19/2022	5	60	

Acres of Grading (Site Preparation Phase): 2.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 112,793; Residential Outdoor: 37,598; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
	Excavators	1	8.00	158	0.38
	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Demolition	Excavators	1	8.00	158	0.38
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Grading	Excavators	2	8.00	158	0.38
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	3.00	97	0.37
Building Construction	Cranes	1	1.40	231	0.29
Building Construction	Forklifts	1	5.00	89	0.20
Building Construction	Welders	1	1.40	46	0.45
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	1	1.50	80	0.38
Paving	Tractors/Loaders/Backhoes	1	3.00	97	0.37
Architectural Coating	Air Compressors	3	5.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Paving	Pavers	1	7.00	130	0.42
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

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	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2022

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					7.2800e-003	0.0000	7.2800e-003	1.1000e-003	0.0000	1.1000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0294	0.0384	6.0000e-005		1.5100e-003	1.5100e-003		1.4400e-003	1.4400e-003	0.0000	5.4333	5.4333	1.1800e-003	0.0000	5.4628
Total	**3.3200e-003**	**0.0294**	**0.0384**	**6.0000e-005**	**7.2800e-003**	**1.5100e-003**	**8.7900e-003**	**1.1000e-003**	**1.4400e-003**	**2.5400e-003**	**0.0000**	**5.4333**	**5.4333**	**1.1800e-003**	**0.0000**	**5.4628**

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	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
Total	**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**

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					3.2800e-003	0.0000	3.2800e-003	5.0000e-004	0.0000	5.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5300e-003	0.0306	0.0413	6.0000e-005		9.9000e-004	9.9000e-004		9.7000e-004	9.7000e-004	0.0000	5.4333	5.4333	1.1800e-003	0.0000	5.4628
Total	**2.5300e-003**	**0.0306**	**0.0413**	**6.0000e-005**	**3.2800e-003**	**9.9000e-004**	**4.2700e-003**	**5.0000e-004**	**9.7000e-004**	**1.4700e-003**	**0.0000**	**5.4333**	**5.4333**	**1.1800e-003**	**0.0000**	**5.4628**

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	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
Total	**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**

3.3 Site Preparation - 2022

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					1.7400e-003	0.0000	1.7400e-003	2.1000e-004	0.0000	2.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4500e-003	0.0173	9.9000e-003	2.0000e-005		6.4000e-004	6.4000e-004		5.9000e-004	5.9000e-004	0.0000	2.1376	2.1376	6.9000e-004	0.0000	2.1549
Total	**1.4500e-003**	**0.0173**	**9.9000e-003**	**2.0000e-005**	**1.7400e-003**	**6.4000e-004**	**2.3800e-003**	**2.1000e-004**	**5.9000e-004**	**8.0000e-004**	**0.0000**	**2.1376**	**2.1376**	**6.9000e-004**	**0.0000**	**2.1549**

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	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
Total	**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**

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					7.8000e-004	0.0000	7.8000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.3000e-004	8.0500e-003	0.0146	2.0000e-005		1.2000e-004	1.2000e-004		1.1000e-004	1.1000e-004	0.0000	2.1376	2.1376	6.9000e-004	0.0000	2.1549
Total	**5.3000e-004**	**8.0500e-003**	**0.0146**	**2.0000e-005**	**7.8000e-004**	**1.2000e-004**	**9.0000e-004**	**9.0000e-005**	**1.1000e-004**	**2.0000e-004**	**0.0000**	**2.1376**	**2.1376**	**6.9000e-004**	**0.0000**	**2.1549**

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	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
Total	**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**

3.4 Grading - 2022

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					5.6500e-003	0.0000	5.6500e-003	3.1000e-003	0.0000	3.1000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7400e-003	0.0685	0.0965	1.6000e-004		3.4800e-003	3.4800e-003		3.2900e-003	3.2900e-003	0.0000	13.5895	13.5895	3.3100e-003	0.0000	13.6723
Total	**7.7400e-003**	**0.0685**	**0.0965**	**1.6000e-004**	**5.6500e-003**	**3.4800e-003**	**9.1300e-003**	**3.1000e-003**	**3.2900e-003**	**6.3900e-003**	**0.0000**	**13.5895**	**13.5895**	**3.3100e-003**	**0.0000**	**13.6723**

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	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
Total	**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**

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					2.5400e-003	0.0000	2.5400e-003	1.4000e-003	0.0000	1.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2100e-003	0.0745	0.1069	1.6000e-004		1.9300e-003	1.9300e-003		1.8700e-003	1.8700e-003	0.0000	13.5895	13.5895	3.3100e-003	0.0000	13.6723
Total	**5.2100e-003**	**0.0745**	**0.1069**	**1.6000e-004**	**2.5400e-003**	**1.9300e-003**	**4.4700e-003**	**1.4000e-003**	**1.8700e-003**	**3.2700e-003**	**0.0000**	**13.5895**	**13.5895**	**3.3100e-003**	**0.0000**	**13.6723**

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	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
Total	**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**

3.5 Trenching - 2022

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	6.2000e-004	6.2800e-003	8.3900e-003	1.0000e-005		3.4000e-004	3.4000e-004		3.1000e-004	3.1000e-004	0.0000	1.0248	1.0248	3.3000e-004	0.0000	1.0331
Total	**6.2000e-004**	**6.2800e-003**	**8.3900e-003**	**1.0000e-005**		**3.4000e-004**	**3.4000e-004**		**3.1000e-004**	**3.1000e-004**	**0.0000**	**1.0248**	**1.0248**	**3.3000e-004**	**0.0000**	**1.0331**

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	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
Total	**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**

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	4.0000e-004	5.5400e-003	8.6300e-003	1.0000e-005		1.4000e-004	1.4000e-004		1.3000e-004	1.3000e-004	0.0000	1.0248	1.0248	3.3000e-004	0.0000	1.0331
Total	**4.0000e-004**	**5.5400e-003**	**8.6300e-003**	**1.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**1.0248**	**1.0248**	**3.3000e-004**	**0.0000**	**1.0331**

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	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
Total	**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**

3.6 Building Construction - 2022

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	0.0141	0.1375	0.1602	2.4000e-004		7.3000e-003	7.3000e-003		6.7400e-003	6.7400e-003	0.0000	20.6841	20.6841	6.5100e-003	0.0000	20.8467
Total	**0.0141**	**0.1375**	**0.1602**	**2.4000e-004**		**7.3000e-003**	**7.3000e-003**		**6.7400e-003**	**6.7400e-003**	**0.0000**	**20.6841**	**20.6841**	**6.5100e-003**	**0.0000**	**20.8467**

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	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
Total	**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**

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	7.0800e-003	0.1081	0.1686	2.4000e-004		2.3700e-003	2.3700e-003		2.2200e-003	2.2200e-003	0.0000	20.6840	20.6840	6.5100e-003	0.0000	20.8467
Total	**7.0800e-003**	**0.1081**	**0.1686**	**2.4000e-004**		**2.3700e-003**	**2.3700e-003**		**2.2200e-003**	**2.2200e-003**	**0.0000**	**20.6840**	**20.6840**	**6.5100e-003**	**0.0000**	**20.8467**

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	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

Total	**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**

3.7 Paving - 2022

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	5.8000e-004	5.2000e-003	6.5500e-003	1.0000e-005		2.5000e-004	2.5000e-004		2.3000e-004	2.3000e-004	0.0000	0.9130	0.9130	2.7000e-004	0.0000	0.9196
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.8000e-004**	**5.2000e-003**	**6.5500e-003**	**1.0000e-005**		**2.5000e-004**	**2.5000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**0.9130**	**0.9130**	**2.7000e-004**	**0.0000**	**0.9196**

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	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
Total	**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**

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	4.5000e-004	5.0600e-003	7.0100e-003	1.0000e-005		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.9130	0.9130	2.7000e-004	0.0000	0.9196
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.5000e-004**	**5.0600e-003**	**7.0100e-003**	**1.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.9130**	**0.9130**	**2.7000e-004**	**0.0000**	**0.9196**

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	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
Total	**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**

3.8 Architectural Coating - 2022

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	0.3968					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.1056	0.1360	2.2000e-004		6.1300e-003	6.1300e-003		6.1300e-003	6.1300e-003	0.0000	19.1494	19.1494	1.2500e-003	0.0000	19.1806
Total	**0.4121**	**0.1056**	**0.1360**	**2.2000e-004**		**6.1300e-003**	**6.1300e-003**		**6.1300e-003**	**6.1300e-003**	**0.0000**	**19.1494**	**19.1494**	**1.2500e-003**	**0.0000**	**19.1806**

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	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
Total	**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**

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	0.3968					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0900e-003	0.0795	0.1374	2.2000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	19.1494	19.1494	1.2500e-003	0.0000	19.1806
Total	**0.4009**	**0.0795**	**0.1374**	**2.2000e-004**		**3.0000e-004**	**3.0000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**19.1494**	**19.1494**	**1.2500e-003**	**0.0000**	**19.1806**

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	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
Total	**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**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	0.0673	0.1892	0.7547	2.7300e-003	0.2728	2.1800e-003	0.2750	0.0733	2.0300e-003	0.0753	0.0000	250.3979	250.3979	8.9300e-003	0.0000	250.6211
Unmitigated	0.0673	0.1892	0.7547	2.7300e-003	0.2728	2.1800e-003	0.2750	0.0733	2.0300e-003	0.0753	0.0000	250.3979	250.3979	8.9300e-003	0.0000	250.6211

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	325.85	313.11	287.14	735,610	735,610
Enclosed Parking Structure	0.00	0.00	0.00		
Total	325.85	313.11	287.14	735,610	735,610

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	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
Enclosed Parking Structure	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.465886	0.050507	0.268464	0.141721	0.017188	0.007113	0.024629	0.006618	0.004259	0.003067	0.009235	0.000505	0.000808
Enclosed Parking Structure	0.465886	0.050507	0.268464	0.141721	0.017188	0.007113	0.024629	0.006618	0.004259	0.003067	0.009235	0.000505	0.000808

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903

NaturalGas Unmitigated	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903

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	560539	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903
Enclosed Parking Structure	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		**3.0200e-003**	**0.0258**	**0.0110**	**1.6000e-004**		**2.0900e-003**	**2.0900e-003**		**2.0900e-003**	**2.0900e-003**	**0.0000**	**29.9125**	**29.9125**	**5.7000e-004**	**5.5000e-004**	**30.0903**

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	560539	3.0200e-003	0.0258	0.0110	1.6000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	29.9125	29.9125	5.7000e-004	5.5000e-004	30.0903
Enclosed Parking Structure	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		**3.0200e-003**	**0.0258**	**0.0110**	**1.6000e-004**		**2.0900e-003**	**2.0900e-003**		**2.0900e-003**	**2.0900e-003**	**0.0000**	**29.9125**	**29.9125**	**5.7000e-004**	**5.5000e-004**	**30.0903**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	221548	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	147074	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	221548	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	147074	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	0.3827	6.8000e-003	0.5200	3.3000e-004		0.0243	0.0243		0.0243	0.0243	2.2339	1.5130	3.7469	4.1600e-003	1.5000e-004	3.8947
Unmitigated	0.3827	6.8000e-003	0.5200	3.3000e-004		0.0243	0.0243		0.0243	0.0243	2.2339	1.5130	3.7469	4.1600e-003	1.5000e-004	3.8947

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	0.0397					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1131	2.6000e-003	0.1557	3.1000e-004		0.0223	0.0223		0.0223	0.0223	2.2339	0.9176	3.1515	3.5900e-003	1.5000e-004	3.2849
Landscaping	0.0110	4.2000e-003	0.3643	2.0000e-005		2.0200e-003	2.0200e-003		2.0200e-003	2.0200e-003	0.0000	0.5955	0.5955	5.7000e-004	0.0000	0.6098
Total	**0.3827**	**6.8000e-003**	**0.5199**	**3.3000e-004**		**0.0243**	**0.0243**		**0.0243**	**0.0243**	**2.2339**	**1.5130**	**3.7469**	**4.1600e-003**	**1.5000e-004**	**3.8947**

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	0.0397					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1131	2.6000e-003	0.1557	3.1000e-004		0.0223	0.0223		0.0223	0.0223	2.2339	0.9176	3.1515	3.5900e-003	1.5000e-004	3.2849

Landscaping	0.0110	4.2000e-003	0.3643	2.0000e-005		2.0200e-003	2.0200e-003		2.0200e-003	2.0200e-003	0.0000	0.5955	0.5955	5.7000e-004	0.0000	0.6098
Total	**0.3827**	**6.8000e-003**	**0.5199**	**3.3000e-004**		**0.0243**	**0.0243**		**0.0243**	**0.0243**	**2.2339**	**1.5130**	**3.7469**	**4.1600e-003**	**1.5000e-004**	**3.8947**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.0129	0.1040	2.4600e-003	4.3456
Unmitigated	1.0129	0.1040	2.4600e-003	4.3456

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	3.19255 / 2.01269	1.0129	0.1040	2.4600e-003	4.3456
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.0129**	**0.1040**	**2.4600e-003**	**4.3456**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	3.19255 / 2.01269	1.0129	0.1040	2.4600e-003	4.3456
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.0129**	**0.1040**	**2.4600e-003**	**4.3456**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	4.5754	0.2704	0.0000	11.3354
Unmitigated	4.5754	0.2704	0.0000	11.3354

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	22.54	4.5754	0.2704	0.0000	11.3354
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**4.5754**	**0.2704**	**0.0000**	**11.3354**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	22.54	4.5754	0.2704	0.0000	11.3354
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**4.5754**	**0.2704**	**0.0000**	**11.3354**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: EMFAC2017 Calculations

Summary of Construction Traffic Emissions (EMFAC2017)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2
					Tons						*Metric Tons*
Criteria Pollutants											
2022	0.0058	0.1159	0.0651	0.0005	0.0196	0.0054	0.0250	0.0030	0.0026	0.0056	51.4811
Toxic Air Contaminants (1 Mile Trip Length)											
2022	0.0031	0.0159	0.0181	0.0000	0.0008	0.0002	0.0010	0.0001	0.0001	0.0002	3.2143

CalEEMod Construction Inputs

Phase	CalEEMod WORKER TRIPS	CalEEMod VENDOR TRIPS	Total Worker Trips	Total Vendor Trips	CalEEMod HAULING TRIPS	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class	*Worker VMT*	*Vendor VMT*	*Hauling VMT*
Demolition	5	0	40	0	67	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	432	0	1340
Site Preparation	3	0	15	0	922	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	162	0	18440
Grading	8	0	120	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1296	0	0
Trenching	3	0	60	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	648	0	0
Building Construction	45	9	2475	495	178	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	26730	3613.5	1299.4
Architectural Coating	9	0	540	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	5832	0	0
Paving	8	0	16	0	0	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	172.8	0	0

Number of Days Per Year					
2022	1/3/22	10/21/22	292	**210**	
			294	**210**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	1/3/2022	1/12/2022	5	8
Site Preparation	1/17/2022	1/21/2022	5	5
Grading	1/24/2022	2/11/2022	5	15
Trenching	2/22/2022	3/21/2022	5	20
Building Construction	4/22/2022	7/7/2022	5	55
Architectural Coating	8/1/2022	10/21/2022	5	60
Paving	6/1/2022	6/2/2022	5	2

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: San Mateo
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_DI	PM2.5_TIR	PM2.5_WB	PM10_RUN	PM10_IDL	PM10_STR	PM10_DI	PM10_TIR	PM10_WB	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNI	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
San Mateo	2022	HHDT	Aggregate	Aggregate	Gasoline	2.777853	472.715	55.57928	2.748403	0	0.013457	0.000841	0	0.000287	0.005	0.02646	0.000914	0	0.000312	0.02	0.06174	1993.356	0	47.87156	0.066368	0	0.000589	0.122942	0	0.000657	0.295052	0	0.003082	0.032556	0.152655	0.008908	0.013368	0.43054	0	0.003374	0.032556	0.152655	0.008908	0.013368	26.85146	0	6.517482	0.019726	0	0.000474
San Mateo	2022	HHDT	Aggregate	Aggregate	Diesel	1215.42	107659.4	105139.66	4.165704	50.99253	2.212041	0.03369	0.041677	0	0.008693	0.025559	0.035214	0.043562	0	0.034774	0.059637	1648.504	8572.517	0	0.004229	0.152316	0	0.259122	1.34748	0	0.091043	3.27933	0	0	0	0	0	0.103645	3.733267	0	0	0	0	0	0.380722	42.35619	0	0.015574	0.080989	0
San Mateo	2022	HHDT	Aggregate	Aggregate	Natural Ga	134.8882	5494.913	526.064	1.204197	21.39831	0	0.00421	0.020699	0	0.009	0.02646	0.004401	0.021634	0	0.036	0.06174	3157.131	4089.807	0	3.342946	1.208742	0	0.643602	0.833734	0	0.116887	0.033614	0	0	0	0	0	3.490479	1.252231	0	0	0	0	0	10.906	19.18613	0	0	0	0
San Mateo	2022	LDA	Aggregate	Aggregate	Gasoline	285883.4	8730359	1356969	0.03605	0	0.193174	0.00125	0	0.001731	0.002	0.01575	0.00136	0	0.001882	0.008	0.03675	254.7223	0	54.53474	0.002104	0	0.052491	0.004124	0	0.025575	0.008184	0	0.24181	0.09584	0.215371	0.166346	0.165388	0.01194	0	0.26475	0.09584	0.215371	0.166346	0.165388	0.581955	0	2.356656	0.002521	0	0.00054
San Mateo	2022	LDA	Aggregate	Aggregate	Diesel	3168.217	96975.13	14978.02	0.065635	0	0	0.000571	0	0	0.002	0.01575	0.005823	0	0	0.008	0.03675	201.5201	0	0	0.000546	0	0	0.031676	0	0	0.011746	0	0	0	0	0	0	0.013372	0	0	0	0	0	0.18472	0	0	0.001905	0	0
San Mateo	2022	LDA	Aggregate	Aggregate	Electricity	7621.214	256590.1	37762.18	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0	0	0	0
San Mateo	2022	LDT1	Aggregate	Aggregate	Gasoline	41432.75	1266108	196720.5	0.063699	0	0.213989	0.001597	0	0.002094	0.002	0.01575	0.001737	0	0.002277	0.008	0.03675	290.5103	0	61.94231	0.003311	0	0.058348	0.005522	0	0.026341	0.014006	0	0.277497	0.117193	0.451758	0.222711	0.237262	0.020427	0	0.303823	0.117193	0.451758	0.222711	0.237262	0.787692	0	2.384672	0.002875	0	0.000613
San Mateo	2022	LDT1	Aggregate	Aggregate	Diesel	16.25248	284.3033	56.05197	0.973767	0	0	0.132117	0	0	0.002	0.01575	0.13809	0	0	0.008	0.03675	403.6574	0	0	0.008132	0	0	0.063449	0	0	0.175077	0	0	0	0	0	0	0.199314	0	0	0	0	0	0.968724	0	0	0.003816	0	0
San Mateo	2022	LDT1	Aggregate	Aggregate	Electricity	359.7921	12796.34	1812.632	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0	0	0	0
San Mateo	2022	LDT2	Aggregate	Aggregate	Gasoline	132267.5	4056131	631991.8	0.054439	0	0.253266	0.00135	0	0.001756	0.002	0.01575	0.001468	0	0.00191	0.008	0.03675	309.9528	0	67.29858	0.002693	0	0.063591	0.005055	0	0.030403	0.010574	0	0.290905	0.08787	0.321064	0.193616	0.17912	0.015425	0	0.318504	0.08787	0.321064	0.193616	0.17912	0.675215	0	2.833844	0.003067	0	0.000666
San Mateo	2022	LDT2	Aggregate	Aggregate	Diesel	1027.683	34465.38	5067.758	0.036059	0	0	0.00431	0	0	0.002	0.01575	0.004505	0	0	0.008	0.03675	272.2158	0	0	0.000608	0	0	0.042789	0	0	0.013089	0	0	0	0	0	0	0.014901	0	0	0	0	0	0.113636	0	0	0.002573	0	0
San Mateo	2022	LDT2	Aggregate	Aggregate	Electricity	1743.196	47537.34	8780.26	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0	0	0	0
San Mateo	2022	LHDT1	Aggregate	Aggregate	Gasoline	8860.681	296397.6	132010.9	0.164845	0.037097	0.481227	0.002071	0	0.000356	0.002	0.03276	0.002252	0	0.000387	0.008	0.07644	992.6659	119.525	18.77226	0.007781	0.119821	0.021008	0.01052	0.003169	0.039372	0.036446	0.425239	0.104681	0.089625	0.634387	0.018517	0.029926	0.053182	0.620507	0.114613	0.089625	0.634387	0.018517	0.029926	0.672007	3.760132	1.686748	0.009823	0.001183	0.000186
San Mateo	2022	LHDT1	Aggregate	Aggregate	Diesel	5881.241	218648.3	73978.61	1.008919	1.817135	0	0.015674	0.026708	0	0.003	0.03276	0.016383	0.027916	0	0.012	0.07644	530.9331	129.4717	0	0.006468	0.005098	0	0.083455	0.020351	0	0.139258	0.10976	0	0	0	0	0	0.158536	0.124954	0	0	0	0	0	0.540902	0.909745	0	0.005019	0.001224	0
San Mateo	2022	LHDT2	Aggregate	Aggregate	Gasoline	1238.578	40924.28	18452.97	0.180484	0.036448	0.486851	0.002003	0	0.000323	0.002	0.03822	0.002179	0	0.000351	0.008	0.08918	1131.957	137.2937	21.32692	0.006639	0.117752	0.020688	0.011966	0.003025	0.038755	0.028918	0.417874	0.102654	0.089873	0.641758	0.017651	0.028619	0.042197	0.60976	0.112393	0.089873	0.641758	0.017651	0.028619	0.528397	3.761867	1.697237	0.011202	0.001359	0.000211
San Mateo	2022	LHDT2	Aggregate	Aggregate	Diesel	2262.753	83013.72	28462.58	0.757324	1.796044	0	0.016155	0.026868	0	0.003	0.03822	0.016885	0.028083	0	0.012	0.08918	595.284	207.3357	0	0.006136	0.005098	0	0.09357	0.03259	0	0.132094	0.10976	0	0	0	0	0	0.15038	0.124954	0	0	0	0	0	0.510466	0.909745	0	0.005628	0.00196	0
San Mateo	2022	MCY	Aggregate	Aggregate	Gasoline	16529.54	149168.5	33059.08	1.153943	0	0.273469	0.001956	0	0.003138	0.001	0.00504	0.002094	0	0.003337	0.004	0.01176	213.0842	0	60.80181	0.329874	0	0.259736	0.066591	0	0.015569	2.210717	0	1.965768	0.5674	1.990179	0.756717	1.245335	2.749517	0	2.139822	0.5674	1.990179	0.756717	1.245335	19.01708	0	9.173957	0.002109	0	0.000602
San Mateo	2022	MDV	Aggregate	Aggregate	Gasoline	80314	2499802	381574.2	0.06087	0	0.297162	0.001379	0	0.001889	0.002	0.01575	0.0015	0	0.002054	0.008	0.03675	372.4557	0	81.68051	0.002995	0	0.073	0.00551	0	0.032365	0.01208	0	0.352502	0.099964	0.339622	0.228954	0.209677	0.017601	0	0.385941	0.099964	0.339622	0.228954	0.209677	0.708583	0	3.157881	0.003686	0	0.000808
San Mateo	2022	MDV	Aggregate	Aggregate	Diesel	2272.544	78162.23	11166.87	0.030566	0	0	0.003443	0	0	0.002	0.01575	0.003598	0	0	0.008	0.03675	354.0945	0	0	0.000407	0	0	0.055659	0	0	0.008755	0	0	0	0	0	0	0.009967	0	0	0	0	0	0.162994	0	0	0.003347	0	0
San Mateo	2022	MDV	Aggregate	Aggregate	Electricity	791.7548	22645.44	4049.972	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0	0	0	0
San Mateo	2022	MH	Aggregate	Aggregate	Gasoline	1080.218	11056.79	108.065	0.243025	0	0.33071	0.001467	0	0.000343	0.003	0.05586	0.001595	0	0.000373	0.012	0.13034	1694.184	0	24.78959	0.009323	0	0.030643	0.018018	0	0.037255	0.037663	0	0.123517	0.051682	1.255047	0.02193	0.051653	0.054958	0	0.135236	0.051682	1.255047	0.02193	0.051653	0.903608	0	2.791484	0.016765	0	0.000245
San Mateo	2022	MH	Aggregate	Aggregate	Diesel	406.2479	4155.317	40.62479	3.121607	0	0	0.049181	0	0	0.004	0.05586	0.051405	0	0	0.016	0.13034	992.5125	0	0	0.003823	0	0	0.156009	0	0	0.08231	0	0	0	0	0	0	0.093704	0	0	0	0	0	0.268912	0	0	0.009383	0	0
San Mateo	2022	MHDT	Aggregate	Aggregate	Gasoline	956.0975	56310.16	19239.6	0.401293	0.088681	0.375151	0.001267	0	0.000435	0.003	0.05586	0.001378	0	0.000473	0.012	0.13034	1713.287	529.7913	38.50416	0.01254	0.269583	0.039811	0.020842	0.007794	0.030516	0.060239	1.015611	0.211025	0.073361	0.429541	0.015892	0.025569	0.0879	1.481978	0.231046	0.073361	0.429541	0.015892	0.025569	1.376857	15.15013	4.694572	0.016954	0.005243	0.000381
San Mateo	2022	MHDT	Aggregate	Aggregate	Diesel	5059.28	329296.5	52181.07	1.960222	6.832488	1.758779	0.030959	0.013394	0	0.003	0.05586	0.032358	0.013999	0	0.012	0.13034	1018.114	861.5358	0	0.003362	0.004323	0	0.160033	0.135421	0	0.072373	0.093082	0	0	0	0	0	0.082391	0.105966	0	0	0	0	0	0.263752	2.486018	0	0.009619	0.008139	0
San Mateo	2022	OBUS	Aggregate	Aggregate	Gasoline	309.4493	17506.11	6191.461	0.33037	0.065013	0.303626	0.001018	0	0.000244	0.003	0.05586	0.001107	0	0.000265	0.012	0.13034	1751.792	374.5056	25.80105	0.010497	0.206047	0.028879	0.018303	0.005993	0.026834	0.049402	0.745556	0.143567	0.02327	0.273775	0.015372	0.030329	0.072088	1.087914	0.157188	0.02327	0.273775	0.015372	0.030329	1.088572	5.770329	3.038446	0.017335	0.003706	0.000255
San Mateo	2022	OBUS	Aggregate	Aggregate	Diesel	640.9896	44517.47	5852.545	2.479476	10.18109	1.868753	0.0211	0.014245	0	0.003	0.05586	0.022055	0.014889	0	0.012	0.13034	1198.226	1839.754	0	0.002945	0.026687	0	0.188345	0.289184	0	0.063402	0.574566	0	0	0	0	0	0.072178	0.654099	0	0	0	0	0	0.255295	8.204825	0	0.01132	0.017381	0
San Mateo	2022	SBUS	Aggregate	Aggregate	Gasoline	77.55394	3920.213	310.2158	0.624562	0.923435	0.499036	0.001669	0	0.000705	0.002	0.3192	0.001815	0	0.000767	0.008	0.7448	829.8891	2479.137	49.61529	0.018397	2.444511	0.064533	0.031012	0.089824	0.04739	0.090991	10.59598	0.372063	0.057941	0.422429	0.008158	0.017898	0.132774	15.46163	0.407362	0.057941	0.422429	0.008158	0.017898	2.030575	81.96501	10.05224	0.008212	0.024533	0.000491
San Mateo	2022	SBUS	Aggregate	Aggregate	Diesel	187.2294	5867.013	2160.601	8.328847	46.1304	0.635561	0.046003	0.057864	0	0.003	0.3192	0.048083	0.060481	0	0.012	0.7448	1161.116	3723.952	0	0.005644	0.013947	0	0.182511	0.585353	0	0.121506	0.300269	0	0	0	0	0	0.138326	0.341834	0	0	0	0	0	0.309322	5.361526	0	0.01097	0.035182	0
San Mateo	2022	UBUS	Aggregate	Aggregate	Gasoline	38.25826	926.8645	153.033	0.309327	0	0.947655	0.00108	0	0.000458	0.00277	0.051797	0.001175	0	0.000498	0.011079	0.120859	2030.959	0	92.62484	0.005436	0	0.113553	0.023538	0	0.07018	0.019935	0	0.563609	0.063702	0.409387	0.011307	0.01505	0.029089	0	0.617081	0.063702	0.409387	0.011307	0.01505	0.364269	0	8.245509	0.020098	0	0.000917
San Mateo	2022	UBUS	Aggregate	Aggregate	Diesel	304.5567	24358.67	1218.227	3.892763	0	0	0.008124	0	0	0.007894	0.031881	0.008491	0	0	0	0.031575	0.074388	1767.776	0	0	0.243684	0	0	0.27787	0	0	0.003482	0	0	0	0	0	0.248697	0	0	0	0	0	0.395545	0	0	0.016712	0	0
San Mateo	2022	UBUS	Aggregate	Aggregate	Natural Ga	39.98943	2699.2	159.9577	0.496847	0	0	0.003228	0	0	0.008689	0.027983	0.003374	0	0	0.034756	0.065295	2042.54	0	0	6.539969	0	0	0.416385	0	0	0.093443	0	0	0	0	0	0	6.674518	0	0	0	0	0	50.8863	0	0	0	0	0

Attachment 4: Project Construction Emissions and Health Risk Calculations

Construction Emissions and Health Risk Calculations

1919 O'Farrell St, San Mateo, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2022	Construction	0.0199	CON_DPM	39.8	0.01213	1.53E-03	2,885	5.30E-07
Total		***0.0199***		***39.8***	***0.0121***	***0.0015***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

1919 O'Farrell St, San Mateo, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2022	Construction	CON_FUG	0.0045	9.1	0.00276	3.48E-04	2,885	1.20E-07
Total			***0.0045***	***9.1***	***0.0028***	***0.0003***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2022	Construction	0.0062	CON_DPM	12.4	0.00379	4.77E-04	2,885	1.65E-07
Total		***0.0062***		***12.4***	***0.0038***	***0.0005***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2022	Construction	CON_FUG	0.0021	4.2	0.00129	1.62E-04	2,885	5.61E-08
Total			***0.0021***	***4.2***	***0.0013***	***0.0002***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

1919 O'Farrell St., San Mateo, CA
Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	(-)	($\mu g/m^3$)
2026	0.0573	0.0441	18.80	0.01	0.10
2027	0.0000	0.0000	0.00	0.00	0.00
Total	-	-	**18.80**	-	-
Maximum	0.0573	0.0441	**-**	**0.01**	**0.10**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	(-)	($\mu g/m^3$)
2026	0.0329	0.0109	5.85	0.007	0.04
2027	0.0000	0.0000	0.00	0.000	0.00
Total	-	-	**5.85**	-	-
Maximum	0.0329	0.0109	**-**	**0.007**	**0.04**

- Tier 4 Interim Engine Mitigation

Maximum Impacts at Little Bloom Early Child Development Center

Construction Year	Unmitigated Emissions				
	Maximum Concentrations		Child Cancer Risk	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	(per million)	(-)	($\mu g/m^3$)
2026	0.0107	0.0026	5.14	0.002	0.01
2027	0.0000	0.0000	0.00	0.000	0.00
Total	-	-	**5.1**	-	-
Maximum	0.0107	0.0026	**-**	**0.002**	**0.01**

1919 O'Farrell St., San Mateo, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					Maximum	
				DPM Conc (ug/m3)	Age			Modeled DPM Conc (ug/m3)	Age				
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2022	0.0573	10	0.78	2022	0.0573	-	-			
1	1	0 - 1	2022	0.0573	10	9.41	2022	0.0573	1	0.16	0.0115	0.0441	0.1014
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**10.2**				**0.16**			

* Third trimester of pregnancy

1919 O'Farrell St., San Mateo, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
				DPM Conc (ug/m3)	Age			Modeled DPM Conc (ug/m3)	Age				
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2022	0.1057	10	1.44	2022	0.1057	-	-			
1	1	0 - 1	2022	0.1057	10	17.36	2022	0.1057	1	0.30	0.0211	0.0233	0.1290
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**18.8**				**0.30**			

* Third trimester of pregnancy

1919 O'Farrell St., San Mateo, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 7.6 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled		Age	Adult			
Exposure	Exposure Duration				Sensitivity	Cancer Risk	DPM Conc (ug/m3)		Sensitivity	Cancer Risk	Hazard	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	Index	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2022	0.0914	10	1.24	2022	0.0914	-	-			
1	1	0 - 1	2022	0.0914	10	15.01	2022	0.0914	1	0.26	0.0183	0.0068	0.0983
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**16.3**				**0.26**			

* Third trimester of pregnancy

1919 O'Farrell St., San Mateo, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
						Infant/Child	Modeled			Adult			
	Exposure		DPM Conc (ug/m3)		Age	Cancer	DPM Conc (ug/m3)		Age	Cancer	Hazard	Fugitive	Total
Exposure Year	Duration (years)	Age	Year	Annual	Sensitivity Factor	Risk (per million)	Year	Annual	Sensitivity Factor	Risk (per million)	Index	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2022	0.0329	10	0.45	2022	0.0329	-	-			
1	1	0 - 1	2022	0.0329	10	5.41	2022	0.0329	1	0.09	0.0066	0.0109	0.0438
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**5.9**				**0.09**			

* Third trimester of pregnancy

Little Bloom Early Child Development Center, San Pablo, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Little Bloom Early Child Development Center - 1 meter - Infant Exposure

Student Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)

Inhalation Dose = C_{air} x SAF x 8-Hr BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
SAF = Student Adjustment Factor (unitless)
= (24 hrs/9 hrs) x (7 days/5 days) = 3.73
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	250	250	250
AT =	70	70	70
SAF =	3.73	3.73	1.00

* 95th percentile 8-hr breathing rates for moderate intensity activities

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	0 - 1	2022	0.0107	10	5.1
2	1			0.0000	10	0.0
3	1			0.0000	3	0.0
4	1			0.0000	3	0.0
5	1			0.0000	3	0.0
6	1			0.0000	3	0.0
7	1			0.0000	3	0.0
8	1			0.0000	3	0.0
9	1			0.0000	3	0.0
Total Increased Cancer Risk						**5.14**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0021	0.0026	0.0132

* Children assumed to be 0 years of age or older with 1 years of Construction Exposure

Attachment 5: Community Risk Modeling Information and Calculations

CT-EMFAC2017 Emissions Factors for J Arthur Younger Freeway (S.R.92) and El Camino Real (S.R. 82)

```
           File Name:   Arth Young 2023.EF
CT-EMFAC2017 Version:   1.0.2.27401
            Run Date:   4/6/2021 11:28:30 AM
                Area:   San Mateo (SF)
       Analysis Year:   2023
              Season:   Annual

======================================================================

Vehicle Category        VMT Fraction            Diesel VMT Fraction     Gas VMT Fraction
                        Across Category         Within Category         Within Category
         Truck 1             0.014                   0.482                   0.518
         Truck 2             0.009                   0.870                   0.113
       Non-Truck             0.977                   0.017                   0.960

======================================================================

               Road Type:               Freeway
     Silt Loading Factor:                  CARB        0.015 g/m2
Precipitation Correction:                  CARB        P = 60 days     N = 365 days

======================================================================

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

       Pollutant Name      55 mph
                PM2.5      0.001174
                  TOG      0.029185
            Diesel PM      0.000271

======================================================================

Fleet Average Running Loss Emission Factors (grams/veh-hour)

       Pollutant Name   Emission Factor
                  TOG          1.190516

======================================================================

Fleet Average Tire Wear Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.002033

======================================================================

Fleet Average Brake Wear Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.016585

======================================================================

Fleet Average Road Dust Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.007239

============================END=======================================
```

File Name:	El Camino 2023.EF
CT-EMFAC2017 Version:	1.0.2.27401
Run Date:	4/6/2021 11:29:24 AM
Area:	San Mateo (SF)
Analysis Year:	2023
Season:	Annual

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.010	0.482	0.518
Truck 2	0.003	0.870	0.113
Non-Truck	0.987	0.017	0.960

Road Type:	Freeway		
Silt Loading Factor:	CARB	0.015 g/m2	
Precipitation Correction:	CARB	P = 60 days	N = 365 days

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	25 mph	30 mph	35 mph
PM2.5	0.002031	0.001607	0.001341
TOG	0.053871	0.042947	0.036009
Diesel PM	0.000201	0.000179	0.000167

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
TOG	1.187879

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.002017

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.016313

Fleet Average Road Dust Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.006964

END

S.R. 92 Traffic Emissions and Health Risk Calculations

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 92 - J. Arthur Younger Freeway
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_EB_ARTH	SR 92 - J. Arthur Younger Freeway Eastbound	EB	2	678.2	0.42	13.3	43.7	3.4	55	41,601
DPM_WB_ARTH	SR 92 - J. Arthur Younger Freeway Westbound	WB	2	672.3	0.42	13.3	43.7	3.4	55	41,601
									Total	83,201

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	55			
Emissions per Vehicle (g/VMT)	0.00027			

2023 Hourly Traffic Volumes and DPM Emissions - DPM_EB_ARTH

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	0.45%	186	5.89E-06	9	5.65%	2351	7.46E-05	17	8.44%	3509	1.11E-04
2	0.25%	105	3.33E-06	10	6.17%	2565	8.14E-05	18	7.44%	3094	9.82E-05
3	0.20%	82	2.60E-06	11	6.44%	2678	8.50E-05	19	5.68%	2364	7.50E-05
4	0.20%	84	2.66E-06	12	6.83%	2839	9.01E-05	20	4.32%	1799	5.71E-05
5	0.46%	190	6.02E-06	13	7.30%	3037	9.64E-05	21	3.09%	1287	4.08E-05
6	1.28%	534	1.70E-05	14	7.64%	3176	1.01E-04	22	2.14%	889	2.82E-05
7	2.52%	1049	3.33E-05	15	8.38%	3486	1.11E-04	23	1.26%	526	1.67E-05
8	4.29%	1785	5.66E-05	16	8.80%	3659	1.16E-04	24	0.78%	326	1.03E-05
								Total		41,601	

2023 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_WB_ARTH

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.44%	185	5.82E-06	9	6.54%	2720	8.55E-05	17	7.49%	3117	9.80E-05
2	0.24%	100	3.15E-06	10	6.29%	2616	8.23E-05	18	7.39%	3074	9.67E-05
3	0.17%	73	2.29E-06	11	6.51%	2706	8.51E-05	19	5.82%	2419	7.61E-05
4	0.19%	78	2.46E-06	12	7.04%	2930	9.21E-05	20	4.01%	1667	5.24E-05
5	0.42%	175	5.52E-06	13	7.46%	3104	9.76E-05	21	2.90%	1208	3.80E-05
6	1.42%	593	1.86E-05	14	7.32%	3045	9.58E-05	22	2.11%	877	2.76E-05
7	3.06%	1272	4.00E-05	15	7.53%	3131	9.85E-05	23	1.39%	580	1.82E-05
8	5.84%	2429	7.64E-05	16	7.61%	3168	9.96E-05	24	0.80%	333	1.05E-05
								Total		41,601	

Analysis Year = ***2023***

Vehicle Type	2019 Caltrans Vehicles (veh/day)	2023 Vehicles (veh/day)
Total	**80,001**	**83,201**

41600.5

Increase From 2019	1.04
Vehicles/Direction	**41,601**
Avg Vehicles/Hour/Direction	1,733

Traffic Data Year = ***2019***

Caltrans AADT (2017) & Truck %s (2018)	AADT Total	Total Truck	Trucks by Axle			
			2	3	4	5
Cumlative + Project Plugas Ave	80,000	1,840	1,141	247	24	429
			62.01%	13.42%	1.30%	23.32%
Percent of Total Vehicles		2.30%	1.43%	0.31%	0.03%	0.54%

Traffic Increase per Year (%) = *1.00%*

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 92 - J. Arthur Younger Freeway
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM2.5_EB_ARTH	SR 92 - J. Arthur Younger Freeway Eastbound	EB	2	678.2	0.42	13.3	44	1.3	55	41,601
PM2.5_WB_ARTH	SR 92 - J. Arthur Younger Freeway Westbound	WB	2	672.3	0.42	13.3	44	1.3	55	41,601
									Total	83,201

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	55			
Emissions per Vehicle (g/VMT)	0.001174			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and PM2.5 Emissions - PM2.5_EB_ARTH

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	0.45%	186	2.55E-05	9	5.65%	2351	3.23E-04	17	8.44%	3509	4.82E-04
2	0.25%	105	1.44E-05	10	6.17%	2565	3.53E-04	18	7.44%	3094	4.25E-04
3	0.20%	82	1.13E-05	11	6.44%	2678	3.68E-04	19	5.68%	2364	3.25E-04
4	0.20%	84	1.15E-05	12	6.83%	2839	3.90E-04	20	4.32%	1799	2.47E-04
5	0.46%	190	2.61E-05	13	7.30%	3037	4.17E-04	21	3.09%	1287	1.77E-04
6	1.28%	534	7.35E-05	14	7.64%	3176	4.37E-04	22	2.14%	889	1.22E-04
7	2.52%	1049	1.44E-04	15	8.38%	3486	4.79E-04	23	1.26%	526	7.22E-05
8	4.29%	1785	2.45E-04	16	8.80%	3659	5.03E-04	24	0.78%	326	4.48E-05
								Total		41,601	

2023 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - PM2.5_WB_ARTH

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.44%	185	2.52E-05	9	6.54%	2720	3.71E-04	17	7.49%	3117	4.25E-04
2	0.24%	100	1.36E-05	10	6.29%	2616	3.56E-04	18	7.39%	3074	4.19E-04
3	0.17%	73	9.90E-06	11	6.51%	2706	3.69E-04	19	5.82%	2419	3.30E-04
4	0.19%	78	1.07E-05	12	7.04%	2930	3.99E-04	20	4.01%	1667	2.27E-04
5	0.42%	175	2.39E-05	13	7.46%	3104	4.23E-04	21	2.90%	1208	1.65E-04
6	1.42%	593	8.07E-05	14	7.32%	3045	4.15E-04	22	2.11%	877	1.19E-04
7	3.06%	1272	1.73E-04	15	7.53%	3131	4.27E-04	23	1.39%	580	7.90E-05
8	5.84%	2429	3.31E-04	16	7.61%	3168	4.32E-04	24	0.80%	333	4.53E-05
								Total		41,601	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 92 - J. Arthur Younger Freeway
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_EB_ARTH	SR 92 - J. Arthur Younger Freeway Eastbound	EB	2	678.2	0.42	13.3	44	1.3	55	41,601
TEXH_WB_ARTH	SR 92 - J. Arthur Younger Freeway Westbound	WB	2	672.3	0.42	13.3	44	1.3	55	41,601
									Total	83,201

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	55			
Emissions per Vehicle (g/VMT)	0.02919			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_EB_ARTH

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	0.45%	186	6.35E-04	9	5.65%	2351	8.03E-03	17	8.44%	3509	1.20E-02
2	0.25%	105	3.58E-04	10	6.17%	2565	8.76E-03	18	7.44%	3094	1.06E-02
3	0.20%	82	2.80E-04	11	6.44%	2678	9.15E-03	19	5.68%	2364	8.08E-03
4	0.20%	84	2.87E-04	12	6.83%	2839	9.70E-03	20	4.32%	1799	6.15E-03
5	0.46%	190	6.49E-04	13	7.30%	3037	1.04E-02	21	3.09%	1287	4.40E-03
6	1.28%	534	1.83E-03	14	7.64%	3176	1.09E-02	22	2.14%	889	3.04E-03
7	2.52%	1049	3.58E-03	15	8.38%	3486	1.19E-02	23	1.26%	526	1.80E-03
8	4.29%	1785	6.10E-03	16	8.80%	3659	1.25E-02	24	0.78%	326	1.11E-03
								Total		41,601	

2023 Hourly Traffic Volumes Per Direction and TOG Exhaust Emissions - TEXH_WB_ARTH

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.44%	185	6.26E-04	9	6.54%	2720	9.21E-03	17	7.49%	3117	1.06E-02
2	0.24%	100	3.39E-04	10	6.29%	2616	8.86E-03	18	7.39%	3074	1.04E-02
3	0.17%	73	2.46E-04	11	6.51%	2706	9.17E-03	19	5.82%	2419	8.19E-03
4	0.19%	78	2.65E-04	12	7.04%	2930	9.92E-03	20	4.01%	1667	5.65E-03
5	0.42%	175	5.94E-04	13	7.46%	3104	1.05E-02	21	2.90%	1208	4.09E-03
6	1.42%	593	2.01E-03	14	7.32%	3045	1.03E-02	22	2.11%	877	2.97E-03
7	3.06%	1272	4.31E-03	15	7.53%	3131	1.06E-02	23	1.39%	580	1.96E-03
8	5.84%	2429	8.23E-03	16	7.61%	3168	1.07E-02	24	0.80%	333	1.13E-03
								Total		41,601	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 92 - J. Arthur Younger Freeway
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_EB_ARTH	SR 92 - J. Arthur Younger Freeway Eastbound	EB	2	678.2	0.42	13.3	44	1.3	55	41,601
TEVAP_WB_ARTH	SR 92 - J. Arthur Younger Freeway Westbound	WB	2	672.3	0.42	13.3	44	1.3	55	41,601
									Total	83,201

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	55			
Emissions per Vehicle per Hour (g/hour)	1.19052			
Emissions per Vehicle per Mile (g/VMT)	0.02165			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_EB_ARTH

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	0.45%	186	4.71E-04	9	5.65%	2351	5.96E-03	17	8.44%	3509	8.89E-03
2	0.25%	105	2.66E-04	10	6.17%	2565	6.50E-03	18	7.44%	3094	7.84E-03
3	0.20%	82	2.07E-04	11	6.44%	2678	6.79E-03	19	5.68%	2364	5.99E-03
4	0.20%	84	2.13E-04	12	6.83%	2839	7.19E-03	20	4.32%	1799	4.56E-03
5	0.46%	190	4.81E-04	13	7.30%	3037	7.70E-03	21	3.09%	1287	3.26E-03
6	1.28%	534	1.35E-03	14	7.64%	3176	8.05E-03	22	2.14%	889	2.25E-03
7	2.52%	1049	2.66E-03	15	8.38%	3486	8.83E-03	23	1.26%	526	1.33E-03
8	4.29%	1785	4.52E-03	16	8.80%	3659	9.27E-03	24	0.78%	326	8.25E-04
								Total		41,601	

2023 Hourly Traffic Volumes Per Direction and TOG Evaporative Emissions - TEVAP_WB_ARTH

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.44%	185	4.65E-04	9	6.54%	2720	6.83E-03	17	7.49%	3117	7.83E-03
2	0.24%	100	2.51E-04	10	6.29%	2616	6.57E-03	18	7.39%	3074	7.72E-03
3	0.17%	73	1.83E-04	11	6.51%	2706	6.80E-03	19	5.82%	2419	6.08E-03
4	0.19%	78	1.97E-04	12	7.04%	2930	7.36E-03	20	4.01%	1667	4.19E-03
5	0.42%	175	4.41E-04	13	7.46%	3104	7.80E-03	21	2.90%	1208	3.04E-03
6	1.42%	593	1.49E-03	14	7.32%	3045	7.65E-03	22	2.11%	877	2.20E-03
7	3.06%	1272	3.20E-03	15	7.53%	3131	7.87E-03	23	1.39%	580	1.46E-03
8	5.84%	2429	6.10E-03	16	7.61%	3168	7.96E-03	24	0.80%	333	8.35E-04
								Total		41,601	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 92 - J. Arthur Younger Freeway
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_EB_ARTH	SR 92 - J. Arthur Younger Freeway Eastbound	EB	2	678.2	0.42	13.3	44	1.3	55	41,601
FUG_WB_ARTH	SR 92 - J. Arthur Younger Freeway Westbound	WB	2	672.3	0.42	13.3	44	1.3	55	41,601
									Total	83,201

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	55			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00203			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01659			
Road Dust - Emissions per Vehicle (g/VMT)	0.00724			
otal Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.02586			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_EB_ARTH

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	0.45%	186	5.62E-04	9	5.65%	2351	7.12E-03	17	8.44%	3509	1.06E-02
2	0.25%	105	3.17E-04	10	6.17%	2565	7.76E-03	18	7.44%	3094	9.37E-03
3	0.20%	82	2.48E-04	11	6.44%	2678	8.11E-03	19	5.68%	2364	7.16E-03
4	0.20%	84	2.54E-04	12	6.83%	2839	8.59E-03	20	4.32%	1799	5.45E-03
5	0.46%	190	5.75E-04	13	7.30%	3037	9.19E-03	21	3.09%	1287	3.90E-03
6	1.28%	534	1.62E-03	14	7.64%	3176	9.61E-03	22	2.14%	889	2.69E-03
7	2.52%	1049	3.18E-03	15	8.38%	3486	1.06E-02	23	1.26%	526	1.59E-03
8	4.29%	1785	5.40E-03	16	8.80%	3659	1.11E-02	24	0.78%	326	9.86E-04
								Total		41,601	

2023 Hourly Traffic Volumes Per Direction and Fugitive PM2.5 Emissions - FUG_WB_ARTH

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	0.44%	185	5.55E-04	9	6.54%	2720	8.16E-03	17	7.49%	3117	9.35E-03
2	0.24%	100	3.00E-04	10	6.29%	2616	7.85E-03	18	7.39%	3074	9.22E-03
3	0.17%	73	2.18E-04	11	6.51%	2706	8.12E-03	19	5.82%	2419	7.26E-03
4	0.19%	78	2.35E-04	12	7.04%	2930	8.79E-03	20	4.01%	1667	5.00E-03
5	0.42%	175	5.27E-04	13	7.46%	3104	9.32E-03	21	2.90%	1208	3.63E-03
6	1.42%	593	1.78E-03	14	7.32%	3045	9.14E-03	22	2.11%	877	2.63E-03
7	3.06%	1272	3.82E-03	15	7.53%	3131	9.40E-03	23	1.39%	580	1.74E-03
8	5.84%	2429	7.29E-03	16	7.61%	3168	9.50E-03	24	0.80%	333	9.98E-04
								Total		41,601	

1919 O'Farrel Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic - TACs & PM2
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Construction Residential MEI Receptor (4.5 meter receptor height)

Emission Year	2023
Receptor Information	Construction Residential MEI receptor
Number of Receptors	1
Receptor Height	4.5 meters
Receptor Distances	At Construction Residential MEI location

Meteorological Conditions

BAAQMD San Francisco Int. Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0041	0.4916	0.3644

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.4555	0.4357	0.0198

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic Cancer Risk
Impacts at Construction Residential MEI - 4.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL
0	0.25	-0.25 - 0*	2023	10	0.0041	0.4916	0.3644	0.056	0.038	0.0017	0.10
1	1	0 - 1	2023	10	0.0041	0.4916	0.3644	0.675	0.461	0.0201	1.16
2	1	1 - 2	2024	10	0.0041	0.4916	0.3644	0.675	0.461	0.0201	1.16
3	1	2 - 3	2025	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
4	1	3 - 4	2026	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
5	1	4 - 5	2027	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
6	1	5 - 6	2028	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
7	1	6 - 7	2029	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
8	1	7 - 8	2030	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
9	1	8 - 9	2031	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
10	1	9 - 10	2032	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
11	1	10 - 11	2033	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
12	1	11 - 12	2034	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
13	1	12 - 13	2035	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
14	1	13 - 14	2036	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
15	1	14 - 15	2037	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
16	1	15 - 16	2038	3	0.0041	0.4916	0.3644	0.106	0.073	0.0032	0.18
17	1	16-17	2039	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
18	1	17-18	2040	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
19	1	18-19	2041	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
20	1	19-20	2042	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
21	1	20-21	2043	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
22	1	21-22	2044	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
23	1	22-23	2045	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
24	1	23-24	2046	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
25	1	24-25	2047	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
26	1	25-26	2048	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
27	1	26-27	2049	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
28	1	27-28	2050	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
29	1	28-29	2051	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
30	1	29-30	2052	1	0.0041	0.4916	0.3644	0.012	0.008	0.0004	0.02
Total Increased Cancer Risk								3.06	2.089	0.091	**5.24**

* Third trimester of pregnancy

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.001	0.44	0.46

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic - TACs & PM2.5 AERMOD Risk Modeling Parameters and Maximum Concentrations - Without MERV13 Filtration On-Site Receptors (1.5 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	1.5 meter
Receptor Distances	7 meter grid spacing

Meteorological Conditions

BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0061	0.8470	0.6279

Construction School MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.7849	0.7508	0.0340

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations - Without MERV13 Filtratio
On-Site Receptors (4.5 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	4.5 meter
Receptor Distances	7 meter grid spacing
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0051	0.5793	0.4295

Construction School MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.5368	0.5135	0.0233

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic Cancer Risk
Impacts at On-Site 1st Floor Receptors - 1.5 meter receptor height
30 Year Residential Exposure - Without MERV13 Filtration

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2023	10	0.0061	0.8470	0.6279	0.083	0.066	0.0029	0.15
1	1	0 - 1	2023	10	0.0061	0.8470	0.6279	0.999	0.794	0.0347	1.83
2	1	1 - 2	2024	10	0.0061	0.8470	0.6279	0.999	0.794	0.0347	1.83
3	1	2 - 3	2025	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
4	1	3 - 4	2026	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
5	1	4 - 5	2027	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
6	1	5 - 6	2028	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
7	1	6 - 7	2029	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
8	1	7 - 8	2030	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
9	1	8 - 9	2031	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
10	1	9 - 10	2032	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
11	1	10 - 11	2033	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
12	1	11 - 12	2034	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
13	1	12 - 13	2035	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
14	1	13 - 14	2036	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
15	1	14 - 15	2037	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
16	1	15 - 16	2038	3	0.0061	0.8470	0.6279	0.157	0.125	0.0055	0.29
17	1	16-17	2039	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
18	1	17-18	2040	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
19	1	18-19	2041	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
20	1	19-20	2042	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
21	1	20-21	2043	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
22	1	21-22	2044	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
23	1	22-23	2045	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
24	1	23-24	2046	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
25	1	24-25	2047	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
26	1	25-26	2048	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
27	1	26-27	2049	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
28	1	27-28	2050	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
29	1	28-29	2051	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
30	1	29-30	2052	1	0.0061	0.8470	0.6279	0.017	0.014	0.0006	0.03
Total Increased Cancer Risk								4.53	3.599	0.157	**8.28**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.001	0.75	0.78

* Third trimester of pregnancy

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic Cancer Risk
Impacts at On-Site 2nd Floor Receptors - 4.5 meter receptor height
30 Year Residential Exposure - Without MERV13 Filtration

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL
0	0.25	-0.25 - 0*	2023	10	0.0051	0.5793	0.4295	0.069	0.045	0.0020	0.12
1	1	0 - 1	2023	10	0.0051	0.5793	0.4295	0.834	0.543	0.0237	1.40
2	1	1 - 2	2024	10	0.0051	0.5793	0.4295	0.834	0.543	0.0237	1.40
3	1	2 - 3	2025	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
4	1	3 - 4	2026	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
5	1	4 - 5	2027	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
6	1	5 - 6	2028	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
7	1	6 - 7	2029	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
8	1	7 - 8	2030	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
9	1	8 - 9	2031	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
10	1	9 - 10	2032	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
11	1	10 - 11	2033	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
12	1	11 - 12	2034	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
13	1	12 - 13	2035	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
14	1	13 - 14	2036	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
15	1	14 - 15	2037	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
16	1	15 - 16	2038	3	0.0051	0.5793	0.4295	0.131	0.086	0.0037	0.22
17	1	16-17	2039	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
18	1	17-18	2040	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
19	1	18-19	2041	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
20	1	19-20	2042	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
21	1	20-21	2043	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
22	1	21-22	2044	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
23	1	22-23	2045	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
24	1	23-24	2046	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
25	1	24-25	2047	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
26	1	25-26	2048	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
27	1	26-27	2049	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
28	1	27-28	2050	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
29	1	28-29	2051	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
30	1	29-30	2052	1	0.0051	0.5793	0.4295	0.015	0.009	0.0004	0.02
Total Increased Cancer Risk								3.78	2.462	0.108	**6.35**

* Third trimester of pregnancy

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.001	0.51	0.54

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic - TACs & PM2.5 AERMOD Risk Modeling Parameters and Maximum Concentrations - With MERV13 Filtration On-Site Receptors (1.5 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	1.5 meter
Receptor Distances	7 meter grid spacing

Meteorological Conditions

BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0018	0.8470	0.6279

Construction School MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.2355	0.2252	0.0102

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic - TACs & PM2.5 AERMOD Risk Modeling Parameters and Maximum Concentrations - With MERV13 Filtration On-Site Receptors (4.5 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	4.5 meter
Receptor Distances	7 meter grid spacing
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0015	0.5793	0.4295

Construction School MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.1610	0.1540	0.0070

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic Cancer Risk
Impacts at On-Site 1st Floor Receptors - 1.5 meter receptor height
30 Year Residential Exposure - With MERV13 Filtration

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age --> / Parameter	3rd Trimester	0 - 2	2 - 16	16 - 30
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2023	10	0.0018	0.8470	0.6279	0.025	0.066	0.0029	0.09
1	1	0 - 1	2023	10	0.0018	0.8470	0.6279	0.300	0.794	0.0347	1.13
2	1	1 - 2	2024	10	0.0018	0.8470	0.6279	0.300	0.794	0.0347	1.13
3	1	2 - 3	2025	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
4	1	3 - 4	2026	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
5	1	4 - 5	2027	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
6	1	5 - 6	2028	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
7	1	6 - 7	2029	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
8	1	7 - 8	2030	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
9	1	8 - 9	2031	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
10	1	9 - 10	2032	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
11	1	10 - 11	2033	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
12	1	11 - 12	2034	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
13	1	12 - 13	2035	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
14	1	13 - 14	2036	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
15	1	14 - 15	2037	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
16	1	15 - 16	2038	3	0.0018	0.8470	0.6279	0.047	0.125	0.0055	0.18
17	1	16-17	2039	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
18	1	17-18	2040	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
19	1	18-19	2041	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
20	1	19-20	2042	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
21	1	20-21	2043	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
22	1	21-22	2044	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
23	1	22-23	2045	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
24	1	23-24	2046	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
25	1	24-25	2047	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
26	1	25-26	2048	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
27	1	26-27	2049	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
28	1	27-28	2050	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
29	1	28-29	2051	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
30	1	29-30	2052	1	0.0018	0.8470	0.6279	0.005	0.014	0.0006	0.02
Total Increased Cancer Risk								1.36	3.599	0.157	**5.11**

* Third trimester of pregnancy

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.000	0.23	0.24

1919 O'Farrell Street, San Mateo, CA - SR92 J Arthur Younger Freeway Traffic Cancer Risk
Impacts at On-Site 2nd Floor Receptors - 4.5 meter receptor height
30 Year Residential Exposure - With MERV13 Filtration

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2023	10	0.0015	0.5793	0.4295	0.021	0.045	0.0020	0.07
1	1	0 - 1	2023	10	0.0015	0.5793	0.4295	0.250	0.543	0.0237	0.82
2	1	1 - 2	2024	10	0.0015	0.5793	0.4295	0.250	0.543	0.0237	0.82
3	1	2 - 3	2025	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
4	1	3 - 4	2026	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
5	1	4 - 5	2027	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
6	1	5 - 6	2028	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
7	1	6 - 7	2029	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
8	1	7 - 8	2030	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
9	1	8 - 9	2031	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
10	1	9 - 10	2032	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
11	1	10 - 11	2033	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
12	1	11 - 12	2034	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
13	1	12 - 13	2035	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
14	1	13 - 14	2036	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
15	1	14 - 15	2037	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
16	1	15 - 16	2038	3	0.0015	0.5793	0.4295	0.039	0.086	0.0037	0.13
17	1	16-17	2039	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
18	1	17-18	2040	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
19	1	18-19	2041	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
20	1	19-20	2042	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
21	1	20-21	2043	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
22	1	21-22	2044	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
23	1	22-23	2045	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
24	1	23-24	2046	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
25	1	24-25	2047	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
26	1	25-26	2048	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
27	1	26-27	2049	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
28	1	27-28	2050	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
29	1	28-29	2051	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
30	1	29-30	2052	1	0.0015	0.5793	0.4295	0.004	0.009	0.0004	0.01
Total Increased Cancer Risk								1.13	2.462	0.108	**3.70**

Maximum Hazard Index	Fugitive PM2.5	Total PM2.5
0.000	0.15	0.16

* Third trimester of pregnancy

S.R. 82 Traffic Emissions and Health Risk Calculations

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 82 - El Camino Real
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_NB_EL_CAM	SR 82 - El Camino Real Northbound	NB	3	327.2	0.20	17.0	55.7	3.4	35	19,968
DPM_SB_EL_CAM	SR 82 - El Camino Real Southbound	SB	3	374.4	0.23	17.0	55.7	3.4	35	19,968
									Total	39,936

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	35	25		
Emissions per Vehicle (g/VMT)	0.00017	0.000201		

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and DPM Emissions - DPM_NB_EL_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.81%	762	7.18E-06	9	6.66%	1331	1.51E-05	17	6.50%	1298	1.47E-05
2	3.15%	629	5.93E-06	10	8.16%	1629	1.54E-05	18	3.85%	768	8.72E-06
3	2.32%	464	4.37E-06	11	6.33%	1265	1.19E-05	19	2.35%	470	4.43E-06
4	1.00%	199	1.87E-06	12	7.66%	1529	1.44E-05	20	1.19%	238	2.24E-06
5	1.00%	199	1.87E-06	13	6.83%	1364	1.29E-05	21	3.02%	602	5.68E-06
6	2.16%	430	4.06E-06	14	6.66%	1331	1.26E-05	22	5.01%	1000	9.43E-06
7	4.67%	933	8.80E-06	15	6.00%	1198	1.13E-05	23	3.32%	662	6.25E-06
8	3.35%	668	7.59E-06	16	4.34%	867	8.18E-06	24	0.66%	132	1.25E-06
								Total		19,968	

2023 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_SB_EL_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.81%	762	8.22E-06	9	6.66%	1331	1.73E-05	17	6.50%	1298	1.69E-05
2	3.15%	629	6.79E-06	10	8.16%	1629	1.76E-05	18	3.85%	768	9.97E-06
3	2.32%	464	5.00E-06	11	6.33%	1265	1.36E-05	19	2.35%	470	5.07E-06
4	1.00%	199	2.14E-06	12	7.66%	1529	1.65E-05	20	1.19%	238	2.57E-06
5	1.00%	199	2.14E-06	13	6.83%	1364	1.47E-05	21	3.02%	602	6.50E-06
6	2.16%	430	4.65E-06	14	6.66%	1331	1.44E-05	22	5.01%	1000	1.08E-05
7	4.67%	933	1.01E-05	15	6.00%	1198	1.29E-05	23	3.32%	662	7.15E-06
8	3.35%	668	8.68E-06	16	4.34%	867	9.36E-06	24	0.66%	132	1.43E-06
								Total		19,968	

Analysis Year = ***2023***

Vehicle Type	2019 Caltrans Vehicles (veh/day)	2023 Vehicles (veh/day)
Total	**38,400**	**39,936**

19968

Increase From 2019 1.04

Vehicles/Direction **19,968**

Avg Vehicles/Hour/Direction 832

Traffic Data Year = ***2019***

Caltrans AADT (2019) & Truck %s (2018)	AADT Total	Total Truck	Trucks by Axle			
			2	3	4	5
SAN MATEO, JCT. RTE. 92	38,400	507	395	71	8	33
			77.91%	14.00%	1.58%	6.51%
Percent of Total Vehicles		1.32%	1.03%	0.18%	0.02%	0.09%

Traffic Increase per Year (%) = *1.00%*

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 82 - El Camino Real
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM2.5_NB_EL_CAM	SR 82 - El Camino Real Northbound	NB	3	327.2	0.20	17.0	56	1.3	35	19,968
PM2.5_SB_EL_CAM	SR 82 - El Camino Real Southbound	SB	3	374.4	0.23	17.0	56	1.3	35	19,968
									Total	39,936

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35	25		
Emissions per Vehicle (g/VMT)	0.001341	0.00203		

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and PM2.5 Emissions - PM2.5_NB_EL_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	224	1.69E-05	9	7.12%	1421	1.63E-04	17	7.43%	1484	1.70E-04
2	0.41%	83	6.25E-06	10	4.37%	873	6.62E-05	18	8.24%	1645	1.89E-04
3	0.37%	75	5.67E-06	11	4.65%	929	7.03E-05	19	5.72%	1142	8.65E-05
4	0.17%	34	2.58E-06	12	5.89%	1175	8.90E-05	20	4.30%	859	6.51E-05
5	0.46%	92	6.96E-06	13	6.17%	1232	9.33E-05	21	3.25%	649	4.91E-05
6	0.85%	169	1.28E-05	14	6.05%	1209	9.15E-05	22	3.31%	662	5.01E-05
7	3.73%	745	5.64E-05	15	7.06%	1409	1.07E-04	23	2.48%	496	3.76E-05
8	7.77%	1551	1.78E-04	16	7.19%	1436	1.09E-04	24	1.87%	374	2.83E-05
								Total		19,968	

2023 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - PM2.5_SB_EL_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	224	1.94E-05	9	7.12%	1421	1.87E-04	17	7.43%	1484	1.95E-04
2	0.41%	83	7.15E-06	10	4.37%	873	7.57E-05	18	8.24%	1645	2.16E-04
3	0.37%	75	6.49E-06	11	4.65%	929	8.05E-05	19	5.72%	1142	9.90E-05
4	0.17%	34	2.95E-06	12	5.89%	1175	1.02E-04	20	4.30%	859	7.45E-05
5	0.46%	92	7.96E-06	13	6.17%	1232	1.07E-04	21	3.25%	649	5.62E-05
6	0.85%	169	1.47E-05	14	6.05%	1209	1.05E-04	22	3.31%	662	5.73E-05
7	3.73%	745	6.46E-05	15	7.06%	1409	1.22E-04	23	2.48%	496	4.30E-05
8	7.77%	1551	2.04E-04	16	7.19%	1436	1.24E-04	24	1.87%	374	3.24E-05
								Total		19,968	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 82 - El Camino Real
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_NB_EL_CAM	SR 82 - El Camino Real Northbound	NB	3	327.2	0.20	17.0	56	1.3	35	19,968
TEXH_SB_EL_CAM	SR 82 - El Camino Real Southbound	SB	3	374.4	0.23	17.0	56	1.3	35	19,968
									Total	39,936

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	35	25		
Emissions per Vehicle (g/VMT)	0.03601	0.05387		

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_NB_EL_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	224	4.55E-04	9	7.12%	1421	4.32E-03	17	7.43%	1484	4.52E-03
2	0.41%	83	1.68E-04	10	4.37%	873	1.78E-03	18	8.24%	1645	5.00E-03
3	0.37%	75	1.52E-04	11	4.65%	929	1.89E-03	19	5.72%	1142	2.32E-03
4	0.17%	34	6.92E-05	12	5.89%	1175	2.39E-03	20	4.30%	859	1.75E-03
5	0.46%	92	1.87E-04	13	6.17%	1232	2.50E-03	21	3.25%	649	1.32E-03
6	0.85%	169	3.44E-04	14	6.05%	1209	2.46E-03	22	3.31%	662	1.35E-03
7	3.73%	745	1.52E-03	15	7.06%	1409	2.87E-03	23	2.48%	496	1.01E-03
8	7.77%	1551	4.72E-03	16	7.19%	1436	2.92E-03	24	1.87%	374	7.61E-04
								Total		19,968	

2023 Hourly Traffic Volumes Per Direction and TOG Exhaust Emissions - TEXH_SB_EL_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	224	5.21E-04	9	7.12%	1421	4.95E-03	17	7.43%	1484	5.17E-03
2	0.41%	83	1.92E-04	10	4.37%	873	2.03E-03	18	8.24%	1645	5.73E-03
3	0.37%	75	1.74E-04	11	4.65%	929	2.16E-03	19	5.72%	1142	2.66E-03
4	0.17%	34	7.92E-05	12	5.89%	1175	2.74E-03	20	4.30%	859	2.00E-03
5	0.46%	92	2.14E-04	13	6.17%	1232	2.87E-03	21	3.25%	649	1.51E-03
6	0.85%	169	3.94E-04	14	6.05%	1209	2.81E-03	22	3.31%	662	1.54E-03
7	3.73%	745	1.73E-03	15	7.06%	1409	3.28E-03	23	2.48%	496	1.15E-03
8	7.77%	1551	5.40E-03	16	7.19%	1436	3.34E-03	24	1.87%	374	8.71E-04
								Total		19,968	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 82 - El Camino Real
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_NB_EL_CAM	SR 82 - El Camino Real Northbound	NB	3	327.2	0.20	17.0	56	1.3	35	19,968
TEVAP_SB_EL_CAM	SR 82 - El Camino Real Southbound	SB	3	374.4	0.23	17.0	56	1.3	35	19,968
									Total	39,936

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	35	25		
Emissions per Vehicle per Hour (g/hour)	1.18788	1.18788		
Emissions per Vehicle per Mile (g/VMT)	0.03394	0.03394		

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_NB_EL_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	224	4.29E-04	9	7.12%	1421	2.72E-03	17	7.43%	1484	2.84E-03
2	0.41%	83	1.58E-04	10	4.37%	873	1.67E-03	18	8.24%	1645	3.15E-03
3	0.37%	75	1.43E-04	11	4.65%	929	1.78E-03	19	5.72%	1142	2.19E-03
4	0.17%	34	6.52E-05	12	5.89%	1175	2.25E-03	20	4.30%	859	1.65E-03
5	0.46%	92	1.76E-04	13	6.17%	1232	2.36E-03	21	3.25%	649	1.24E-03
6	0.85%	169	3.24E-04	14	6.05%	1209	2.32E-03	22	3.31%	662	1.27E-03
7	3.73%	745	1.43E-03	15	7.06%	1409	2.70E-03	23	2.48%	496	9.50E-04
8	7.77%	1551	2.97E-03	16	7.19%	1436	2.75E-03	24	1.87%	374	7.17E-04
								Total		19,968	

2023 Hourly Traffic Volumes Per Direction and TOG Evaporative Emissions - TEVAP_SB_EL_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	224	4.91E-04	9	7.12%	1421	3.12E-03	17	7.43%	1484	3.26E-03
2	0.41%	83	1.81E-04	10	4.37%	873	1.92E-03	18	8.24%	1645	3.61E-03
3	0.37%	75	1.64E-04	11	4.65%	929	2.04E-03	19	5.72%	1142	2.51E-03
4	0.17%	34	7.46E-05	12	5.89%	1175	2.58E-03	20	4.30%	859	1.88E-03
5	0.46%	92	2.01E-04	13	6.17%	1232	2.70E-03	21	3.25%	649	1.42E-03
6	0.85%	169	3.71E-04	14	6.05%	1209	2.65E-03	22	3.31%	662	1.45E-03
7	3.73%	745	1.63E-03	15	7.06%	1409	3.09E-03	23	2.48%	496	1.09E-03
8	7.77%	1551	3.40E-03	16	7.19%	1436	3.15E-03	24	1.87%	374	8.21E-04
								Total		19,968	

1919 O'Farrell St, San Mateo, CA - Off-Site Residential
Cumulative Operation - SR 82 - El Camino Real
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_NB_EL_CAM	SR 82 - El Camino Real Northbound	NB	3	327.2	0.20	17.0	56	1.3	35	19,968
FUG_SB_EL_CAM	SR 82 - El Camino Real Southbound	SB	3	374.4	0.23	17.0	56	1.3	35	19,968
									Total	39,936

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35	25		
Tire Wear - Emissions per Vehicle (g/VMT)	0.00202	0.00202		
Brake Wear - Emissions per Vehicle (g/VMT)	0.01631	0.01631		
Road Dust - Emissions per Vehicle (g/VMT)	0.00696	0.00696		
otal Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.02529	0.02529		

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_NB_EL_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	224	3.20E-04	9	7.12%	1421	2.03E-03	17	7.43%	1484	2.12E-03
2	0.41%	83	1.18E-04	10	4.37%	873	1.25E-03	18	8.24%	1645	2.35E-03
3	0.37%	75	1.07E-04	11	4.65%	929	1.33E-03	19	5.72%	1142	1.63E-03
4	0.17%	34	4.86E-05	12	5.89%	1175	1.68E-03	20	4.30%	859	1.23E-03
5	0.46%	92	1.31E-04	13	6.17%	1232	1.76E-03	21	3.25%	649	9.27E-04
6	0.85%	169	2.42E-04	14	6.05%	1209	1.73E-03	22	3.31%	662	9.45E-04
7	3.73%	745	1.06E-03	15	7.06%	1409	2.01E-03	23	2.48%	496	7.08E-04
8	7.77%	1551	2.22E-03	16	7.19%	1436	2.05E-03	24	1.87%	374	5.35E-04
								Total		19,968	

2023 Hourly Traffic Volumes Per Direction and Fugitive PM2.5 Emissions - FUG_SB_EL_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	224	3.66E-04	9	7.12%	1421	2.32E-03	17	7.43%	1484	2.43E-03
2	0.41%	83	1.35E-04	10	4.37%	873	1.43E-03	18	8.24%	1645	2.69E-03
3	0.37%	75	1.22E-04	11	4.65%	929	1.52E-03	19	5.72%	1142	1.87E-03
4	0.17%	34	5.56E-05	12	5.89%	1175	1.92E-03	20	4.30%	859	1.40E-03
5	0.46%	92	1.50E-04	13	6.17%	1232	2.01E-03	21	3.25%	649	1.06E-03
6	0.85%	169	2.77E-04	14	6.05%	1209	1.98E-03	22	3.31%	662	1.08E-03
7	3.73%	745	1.22E-03	15	7.06%	1409	2.30E-03	23	2.48%	496	8.11E-04
8	7.77%	1551	2.54E-03	16	7.19%	1436	2.35E-03	24	1.87%	374	6.12E-04
								Total		19,968	

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic - TACs & PM
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Construction Residential MEI Receptor (4.5 meter receptor height)

Emission Year	2023
Receptor Information	Construction Residential MEI receptor
Number of Receptors	1
Receptor Height	4.5 meters
Receptor Distances	At Construction Residential MEI location

Meteorological Conditions

BAAQMD San Francisco Int. Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0002	0.0425	0.0345

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0274	0.0258	0.0016

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic Cancer Risk
Impacts at Construction Residential MEI - 4.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0002	0.0425	0.0345	0.002	0.003	0.0002	0.01
1	1	0 - 1	2021	10	0.0002	0.0425	0.0345	0.030	0.040	0.0019	0.07
2	1	1 - 2	2022	10	0.0002	0.0425	0.0345	0.030	0.040	0.0019	0.07
3	1	2 - 3	2023	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
4	1	3 - 4	2024	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
5	1	4 - 5	2025	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
6	1	5 - 6	2026	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
7	1	6 - 7	2027	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
8	1	7 - 8	2028	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
9	1	8 - 9	2029	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
10	1	9 - 10	2030	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
11	1	10 - 11	2031	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
12	1	11 - 12	2032	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
13	1	12 - 13	2033	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
14	1	13 - 14	2034	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
15	1	14 - 15	2035	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
16	1	15 - 16	2036	3	0.0002	0.0425	0.0345	0.005	0.006	0.0003	0.01
17	1	16-17	2037	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
18	1	17-18	2038	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
19	1	18-19	2039	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
20	1	19-20	2040	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
21	1	20-21	2041	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
22	1	21-22	2042	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
23	1	22-23	2043	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
24	1	23-24	2044	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
25	1	24-25	2045	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
26	1	25-26	2046	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
27	1	26-27	2047	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
28	1	27-28	2048	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
29	1	28-29	2049	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
30	1	29-30	2050	1	0.0002	0.0425	0.0345	0.001	0.001	0.0000	0.00
Total Increased Cancer Risk								0.13	0.181	0.009	**0.32**

Maximum Hazard Index	Maximum Fugitive PM2.5	Maximum Total PM2.5
0.00004	0.03	0.03

* Third trimester of pregnancy

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Receptors (1.5 meter receptor height)

Emission Year	2023
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	1.5 meter
Receptor Distances	7 meter grid spacing

Meteorological Conditions

BAAQMD San Francisco Int. Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0001	0.0227	0.0183

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0145	0.0137	0.0009

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Receptors (4.5 meter receptor height)

Emission Year	2023
Receptor Information	Maximum On-Site Receptor
Number of Receptors	41
Receptor Height	4.5 meter
Receptor Distances	7 meter grid spacing

Meteorological Conditions

BAAQMD San Francisco Int. Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0001	0.0198	0.0159

Construction School MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0126	0.0119	0.0007

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic Cancer Risk
Impacts at On-Site 1st Floor Receptors - 1.5 meter receptor height
30 Year Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age --> / Parameter	3rd Trimester	0 - 2	2 - 16	16 - 30
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0001	0.0227	0.0183	0.001	0.002	0.0001	0.00
1	1	0 - 1	2021	10	0.0001	0.0227	0.0183	0.015	0.021	0.0010	0.04
2	1	1 - 2	2022	10	0.0001	0.0227	0.0183	0.015	0.021	0.0010	0.04
3	1	2 - 3	2023	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
4	1	3 - 4	2024	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
5	1	4 - 5	2025	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
6	1	5 - 6	2026	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
7	1	6 - 7	2027	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
8	1	7 - 8	2028	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
9	1	8 - 9	2029	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
10	1	9 - 10	2030	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
11	1	10 - 11	2031	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
12	1	11 - 12	2032	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
13	1	12 - 13	2033	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
14	1	13 - 14	2034	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
15	1	14 - 15	2035	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
16	1	15 - 16	2036	3	0.0001	0.0227	0.0183	0.002	0.003	0.0002	0.01
17	1	16-17	2037	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
18	1	17-18	2038	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
19	1	18-19	2039	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
20	1	19-20	2040	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
21	1	20-21	2041	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
22	1	21-22	2042	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
23	1	22-23	2043	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
24	1	23-24	2044	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
25	1	24-25	2045	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
26	1	25-26	2046	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
27	1	26-27	2047	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
28	1	27-28	2048	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
29	1	28-29	2049	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
30	1	29-30	2050	1	0.0001	0.0227	0.0183	0.000	0.000	0.0000	0.00
Total Increased Cancer Risk								0.07	0.096	0.005	**0.17**

* Third trimester of pregnancy

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.00002	0.01	0.01

1919 O'Farrell Street, San Mateo, CA - SR82 El Camino Real Traffic Cancer Risk
Impacts at On-Site 2nd Floor Receptors - 4.5 meter receptor height
30 Year Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0001	0.0198	0.0159	0.001	0.002	0.0001	0.00
1	1	0 - 1	2021	10	0.0001	0.0198	0.0159	0.013	0.019	0.0009	0.03
2	1	1 - 2	2022	10	0.0001	0.0198	0.0159	0.013	0.019	0.0009	0.03
3	1	2 - 3	2023	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
4	1	3 - 4	2024	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
5	1	4 - 5	2025	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
6	1	5 - 6	2026	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
7	1	6 - 7	2027	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
8	1	7 - 8	2028	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
9	1	8 - 9	2029	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
10	1	9 - 10	2030	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
11	1	10 - 11	2031	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
12	1	11 - 12	2032	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
13	1	12 - 13	2033	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
14	1	13 - 14	2034	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
15	1	14 - 15	2035	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
16	1	15 - 16	2036	3	0.0001	0.0198	0.0159	0.002	0.003	0.0001	0.01
17	1	16-17	2037	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
18	1	17-18	2038	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
19	1	18-19	2039	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
20	1	19-20	2040	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
21	1	20-21	2041	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
22	1	21-22	2042	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
23	1	22-23	2043	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
24	1	23-24	2044	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
25	1	24-25	2045	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
26	1	25-26	2046	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
27	1	26-27	2047	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
28	1	27-28	2048	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
29	1	28-29	2049	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
30	1	29-30	2050	1	0.0001	0.0198	0.0159	0.000	0.000	0.0000	0.00
Total Increased Cancer Risk								0.06	0.084	0.004	**0.15**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.00002	0.01	0.01

* Third trimester of pregnancy

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

Click here for guidance on coducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requester Contact Information

Date of Request	**3/31/2021**
Contact Name	Zachary Palm
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x117
Email	zpalm@illingworthrodkin.com
Project Name	1919 O'Farrell Street
Address	1919 O'Farrell Street
City	San Mateo
County	San Mateo
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	49 units

Comments:

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A e forms will not be processed. Please include a project site map.

2. Download and install the free program Google Earth, **http://www.google.com/earth/download/ge/,** and then download the county specific Google Earth stationary source application files from the District's website, **http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.** The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.

3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.

4. Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.

5. List the stationary source information in Table B n only.

6. Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.

7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Areana Flores at 415-749-4616, or aflores@baaqmd.gov

Table B: Google Earth data

Distance from Receptor (feet) or MEI[1]	Plant No.	Facility Name	Address	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments
560	14783	City of San Mateo City Hall	330 W 20th Avenue	0.57	0	0		Generators		2018 Dataset
830	15250	Casiopea Bovet LLC	155 Bovet Road	0.7	0	0		Generators		2018 Dataset
1000+	20790	1730 S El Camino Real Partners LP	1730 So El Camino Real	2.04	0	0.01		Generators		2018 Dataset
50	22742	Park 20	1950 Elk Horn Court	0.28	0	0		Generators		2018 Dataset

Construction MEI

Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
0.10	0.06	0.000000	0.00
0.06	0.04	0.000000	0.00
0.04	0.08	0.000000	0.00
1	0.28	0.000000	0.00

Footnotes:

1. Maximally exposed individual

Project Site

Distance from Receptor (feet) or MEI[1]	FACID (Plant No.)	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
400	14783	0.16	0.09	0.000000	0.00
550	15250	0.10	0.07	0.000000	0.00
1000	20790	0.04	0.08	0.000000	0.00
150	22742	0.58	0.16	0.000000	0.00

2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.

7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003 or less.
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010.
    Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

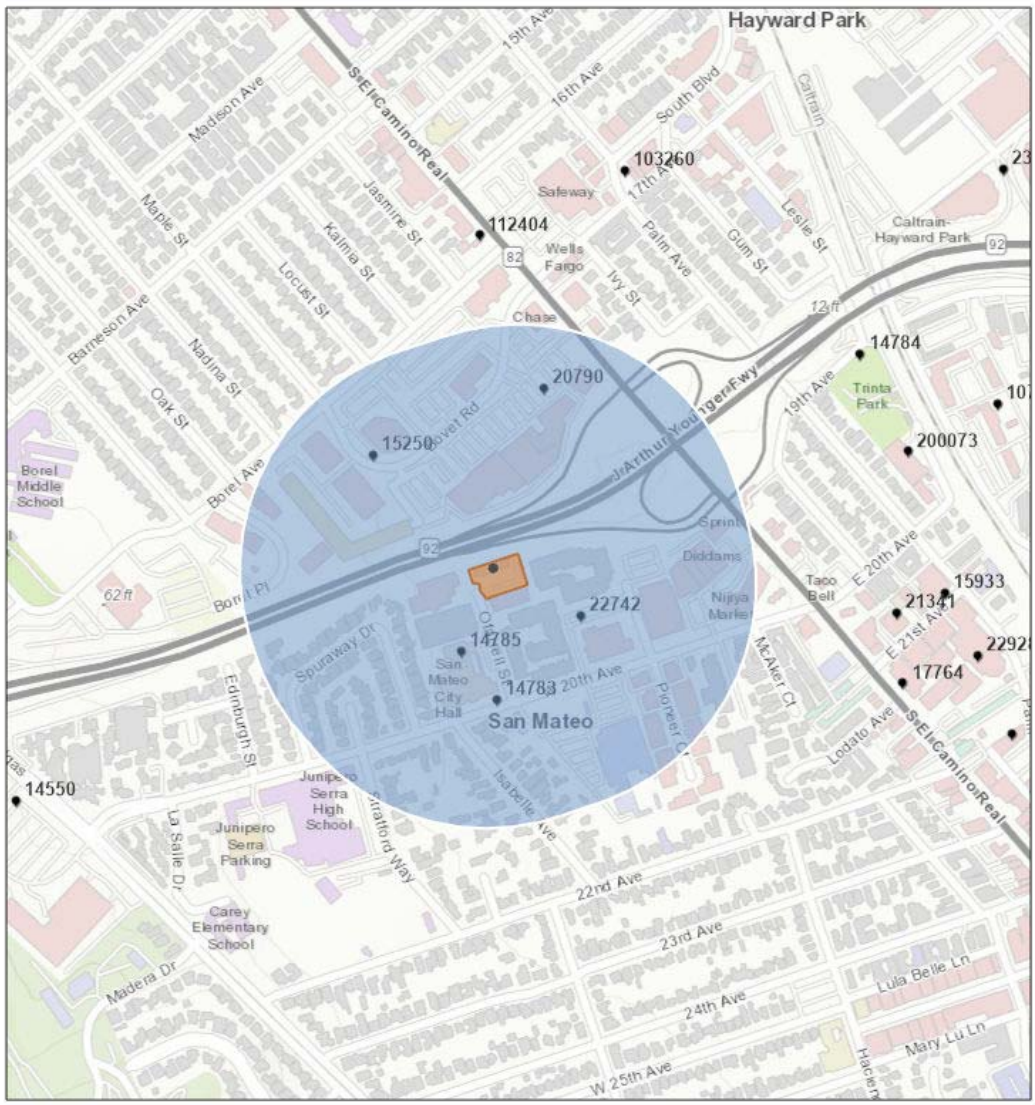
Date last updated:
03/13/2018

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 3,878,161.49 ft²

Mar 31 2021 8:23:11 Pacific Daylight Time



Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Facilities 2018	5	N/A	N/A

Permitted Facilities 2018

#	FACID	Name	Address	City	St
1	14783	City of San Mateo City Hall	330 W 20th Avenue	San Mateo	CA
2	14785	City of San Mateo	2100 Detroit Drive	San Mateo	CA
3	15250	Casiopea Bovet LLC	155 Bovet Road	San Mateo	CA
4	20790	1730 S El Camino Real Partners LP	1730 So El Camino Real	San Mateo	CA
5	22742	Park 20	1950 Elk Horn Court	San Mateo	CA

#	Zip	County	Cancer	Hazard	PM_25	Type	Count
1	94403	San Mateo	0.570	0.000	0.000	Generators	1
2	94404	San Mateo	0.000	0.000	0.000	Contact BAAQMD	1
3	94402	San Mateo	0.700	0.000	0.000	Generators	1
4	94402	San Mateo	2.040	0.000	0.010	Generators	1
5	94403	San Mateo	0.280	0.000	0.000	Generators	1

Note: The estimated risk and hazard impacts from these sources would be expected to be substantially lower when site specific Health Risk Screening Assessments are conducted.

The screening level map is not recommended for evaluating sensitive land uses such as schools, senior centers, day cares, and health facilities.