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BERTOLUCCI MIXED-USE DEVELOPMENT CONSTRUCTION COMMUNITY HEALTH RISK ASSESSMENT

South San Francisco, California

February 3, 2022

Prepared for:

Peter Sodini
421 Cypress Avenue
South San Francisco, CA 94080

Prepared by:

Zachary Palm &
James A. Reyff

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Project#: 21-204

Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of the proposed multi-use building located at 209, 213 Lux Avenue and 421 Cypress Avenue in South San Francisco, California. The air quality impacts from this project would be associated with construction of the new buildings. 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] BAAQMD recommends using a 1,000-foot screening radius around the project site for purposes of identifying community health risk from existing sources of TACs.

Project Description

The project site is comprised of three parcels at 209 and 213 Lux Avenue, and 421 Cypress Avenue which currently contains the existing Bertolucci's restaurant. The project proposes to demolish the existing restaurant building and construct 99 multi-family dwelling units above ground-level parking that provides 90 parking spaces inside and 9 parking spaces outside. The Bertolucci's restaurant will also be reconstructed within the same building, encompassing 1,500 square feet (sf) of the ground floor. Construction is proposed to begin in January 2023 and be completed by December 2023.

The Project is consistent with development that would occur as planned under the South San Francisco Downtown Station Area Specific Plan. Air quality impacts were evaluated under the South San Francisco Downtown Station Area Specific Plan EIR.[2] This project is subject to air quality mitigation measures associated with the South San Francisco Downtown Station Area Specific Plan EIR. This analysis addresses these mitigation requirements. Specifically:

1. **Mitigation Measure MM4.2-1** requires the emissions modeling of construction activities to identify appropriate mitigation measures to reduce emissions below significance criteria;
2. **Mitigation Measure MM4.2-2** requires quantification of operational emissions to demonstrate that adequate measures have been identified to reduce emissions; and
3. **Mitigation Measure MM4.2-3** requires a health risk assessment that assesses the impacts of air pollution sources that could affect the project's residents and, if necessary, identify appropriate measures to reduce the potential health risk to below significant level.

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

[1] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2017.
[2] City of South San Francisco Economic and Community Development Department. 2014. *Draft South San Francisco Downtown Station Area Specific Plan EIR SCH No. 2013102001*

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.

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.[3]

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 (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.[4] 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.

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

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

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, 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.[5] 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. Overburdened communities are areas located (i) within a census tract identified by the California Communities Environmental Health Screening Tool

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

(CalEnviroScreen), Version 4.0 implemented by OEHHA, as having an overall CalEnviroScreen score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract.[6] 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 and not within a BAAQMD overburdened area as identified by CalEnviroScreen.

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[7] 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.

South San Francisco General Plan 1999

The South San Francisco General Plan 1999 includes guiding and implementing policies to reduce exposure of the City's sensitive population to exposure of air pollution, toxic air contaminants, and greenhouse gases. While the city is in the process of updating its general plan, the version passed in 1999 is still the most recent version. The following guiding and implementing policies are applicable to the proposed project:

GUIDING POLICIES: AIR QUALITY AND GREENHOUSE GAS EMISSIONS

7.3-G-1 Continue to work toward improving air quality and meeting all national and State ambient air quality standards and by reducing the generation of air pollutants both from stationary and mobile sources, where feasible.

7.3-G-2 Mitigate the community of South San Francisco's impact on climate change by reducing greenhouse gas emissions consistent with state guidance.

7.3-G-3 Reduce energy use in the built environment.

7.3-G-4 Encourage land use and transportation strategies that promote use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.

7.3-G-5 Promote clean and alternative fuel combustion in mobile equipment and vehicles.

7.3-G-6 Minimize conflicts between sensitive receptors and emissions generators by distancing them from one another.

[6] See BAAQMD: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20210722_01_appendixd_mapsofoverburdenedcommunities-pdf.pdf?la=en , accessed 10/1/2021.
[7] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

IMPLEMENTING POLICIES: AIR QUALITY AND GREENHOUSE GAS EMISSIONS

7.3-1-1 Cooperate with the Bay Area Air Quality Management District to achieve emissions reductions for nonattainment pollutants and their precursors, including carbon monoxide, ozone, and PM-10, by implementation of air pollution control measures as required by State and federal statutes.

7.3-1-2 Use the City's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality and GHG emissions.

7.3-1-3 Adopt the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.

7.3-1-4 Require new residential development and remodeled existing homes to install clean-burning fireplaces and wood stoves.

7.3-1-5 In cooperation with local conservation groups, institute an active urban forest management program that consists of planting new trees and maintaining existing ones.

7.3-1-6 Periodically update the inventory of community-wide GHG emissions and evaluate appropriate GHG emissions reduction targets, consistent with current State objectives, statewide guidance, and regulations.

7.3-1-7 Adopt and implement the City of South San Francisco's CAP, which will identify a GHG emissions reduction target and measures and actions to achieve the reduction target.

7.3-1-8 Evaluate and regularly report to City Council, or its designee, on the implementation status of the CAP and update the CAP as necessary should the City find that adopted strategies are not achieving anticipated reductions, or to otherwise incorporate new opportunities.

7.3-1-9 Promote land uses that facilitate alternative transit use, including high-density housing, mixed uses, and affordable housing served by alternative transit infrastructure.

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 to the east of the project site, and the single-family residences to the north of the project site. This project would 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. Impacts above these thresholds are considered potentially significant.

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	**Construction Thresholds**	**Operational Thresholds**	
	Average Daily Emissions (lbs./day)	**Average Daily Emissions (lbs./day)**	**Annual Average Emissions (tons/year)**
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)**	
Excess Cancer Risk	10 per one million	100 per one million	
Hazard Index	1.0	10.0	
Incremental annual $PM_{2.5}$	0.3 µg/m^3	0.8 µg/m^3	
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions	Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) *		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, 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.

*BAAQMD does not have a recommended post-2020 GHG threshold.

Construction Community Risk Impacts and Mitigation Measures

MM4.2-1 Requirement - Project Construction Activity

Construction 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 $PM_{2.5}$.[8] 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 2020.4.0 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 2021 (EMFAC2021) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[9] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

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

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Apartments Mid Rise	99	Dwelling Unit	119,257	0.58
Enclosed Parking with Elevator	90	Parking Spaces	22,995	
Parking Lot	9	Parking Spaces	3,600	
Quality Restaurant	1.5	1,000-sf	1,500	

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,

[8] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.
[9] See CARB's EMFAC2021 Emissions Inventory at https://arb.ca.gov/emfac/emissions-inventory.

including equipment list and schedule, were based on CalEEMod defaults that were reviewed and slightly modified by the 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, average hours per day, and total number of workdays was 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 2023 and would be built out over a period of approximately 12 months, or 259 construction workdays. The earliest year of full operation was assumed to be 2024.

Construction Truck Traffic Emissions

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 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 anticipated grading volumes by assuming each truck could carry 10 tons per load. The number of concrete and asphalt total round haul trips were estimated for the project and converted to total one-way trips, assuming two trips per delivery.

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2017 motor vehicle emission factor model. This model has been superseded by the EMFAC2021 model; however, CalEEMod has not been updated to include EMFAC2021. Therefore, the construction traffic information was combined with EMFAC2021 motor vehicle emissions factors. EMFAC2021 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 (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 2023 was used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2021 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2021 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]	50% LDA 25% LDT1 25% LDT2	50% MHDT 50% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0	CalEEMod default distance with 5-min truck idle time.
Demolition	260	-	96	13,000-sf building demo. CalEEMod default worker trips.
Site Preparation	24	-	-	CalEEMod default worker trips.
Grading	60	-	1,425	9,400-cy soil export. 2,000-cy soil import. CalEEMod default worker trips.
Trenching	150	-	-	CalEEMod default worker trips.
Building Construction	18,260	3,300	210	Est 23,600-sf concrete. CalEEMod default worker and vendor trips.
Architectural Coating	170	-	-	CalEEMod default worker trips.
Paving	150	-	31	Est. 32,670-sf asphalt. CalEEMod default worker trips.

Notes: [1] Based on 2023 EMFAC2021 light-duty vehicle fleet mix for San Mateo County.
[2] Includes demolition trips estimated by CalEEMod based on amount of material to be removed. Cement and asphalt trips estimated based on project size and land uses.

Summary of Computed Construction Period Emissions

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions and dividing those emissions by the number of active workdays during that year. Table 4 shows the annualized average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 4, predicted annualized project construction emissions would not exceed the BAAQMD significance thresholds during any year of construction.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions Per Year (Tons)				
2023	1.10	2.00	0.09	0.08
Average Daily Construction Emissions Per Year (pounds/day)				
2023 (259 construction workdays)	8.49	15.47	0.73	0.64
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	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. Per MM4.2-1 of the South San Francisco Downtown Station Area Specific Plan EIR, BAAQMD *Basic Construction Mitigation Measures* would apply to this project since construction period emissions would be below the City-adopted thresholds that are contained in the BAAQMD CEQA Air Quality Guidelines. The following *BAAQMD-recommended best management practices* apply to this project:

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.

Community Health Risk from Project Construction

Construction Emissions

The CalEEMod model and EMFAC2021 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 0.08 tons (165 pounds). The on-road emissions are a result of haul truck travel during 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 0.02 tons (35 pounds) for the overall construction period.

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.[10] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Combustion equipment DPM exhaust emissions were modeled as a series of point sources with a nine-foot release height (construction equipment exhaust stack height) placed at 23 feet (7 meter) intervals throughout the construction site. This resulted in 60 individual point sources being used to represent mobile equipment DPM exhaust emissions in the respective construction area, with DPM emissions occurring throughout the project construction site. In addition, the following stack parameters were used: a vertical release, a stack diameter of 2.5 inches, an exhaust temperature of 918˚F, and an exit velocity of 309 feet per second. Since these are point sources plume rise is calculated by the AERMOD dispersion model. Emissions from vehicle travel on- and off-site were also distributed among the point sources throughout the site. The locations of the point sources used for the modeling are identified in Figure 1.

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.

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

The modeling used a five-year data set (2013 - 2017) of hourly meteorological data from the San Francisco International Airport was used with the AERMOD model. Construction emissions were modeled as occurring daily between 8:00 a.m. to 5:00 p.m., when the majority of construction activity is expected to occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2023 period were calculated using the model. 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 floor of nearby single and multi-family residences.[11]

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 infants and small children to cancer causing TACs. 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 (15 feet above ground) of the adjacent multi-family home east of the construction project site. Table 5 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.

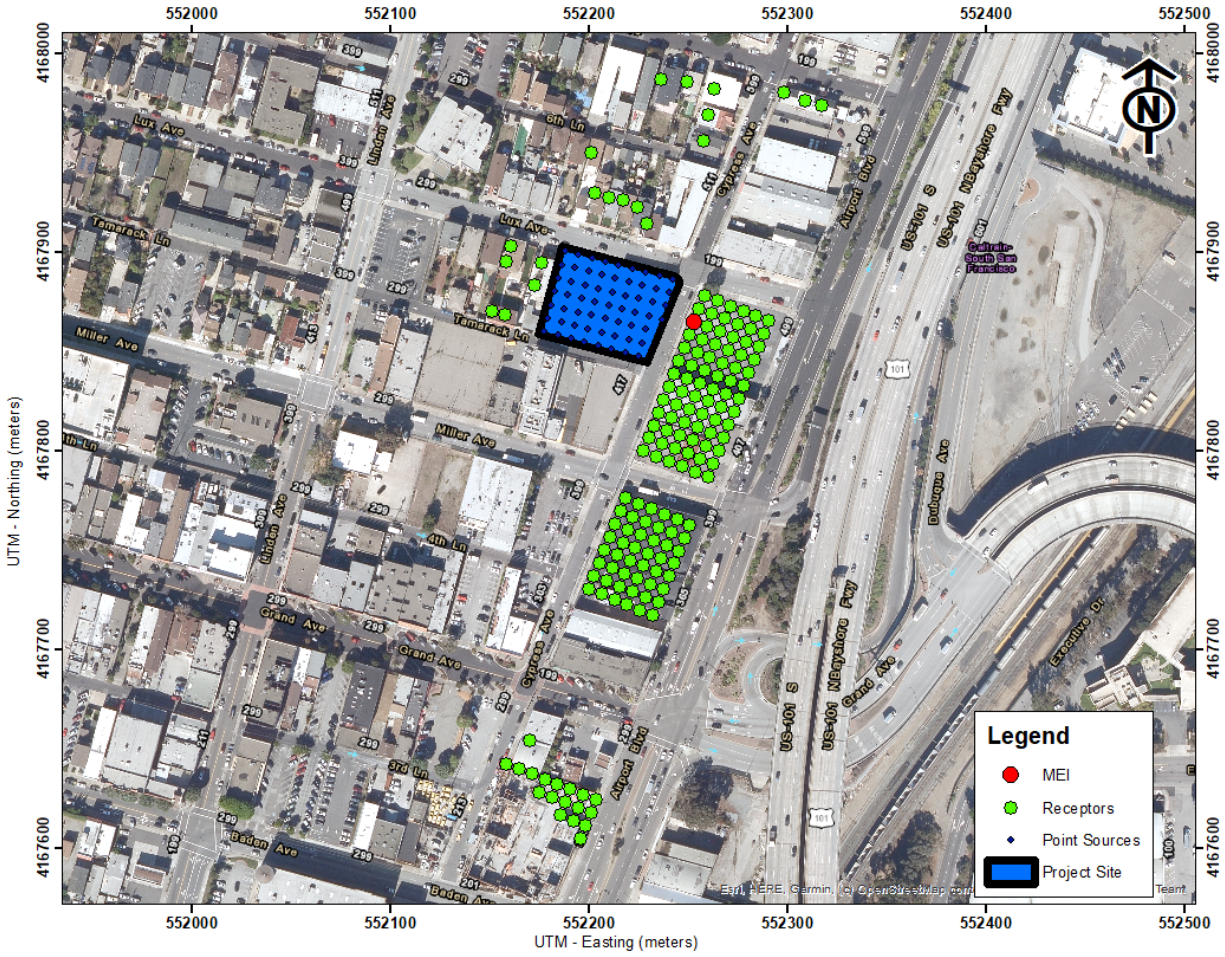
Table 5. Construction Risk Impacts at the Off-site MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	**62.82 (infant)**	**0.45**	0.07
	Mitigated	3.83 (infant)	0.07	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	***Yes***	*No*
	Mitigated	*No*	*No*	*No*

*Tier 4 Interim, Best Management Practices, and electric welders used as mitigation.

[11] 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

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

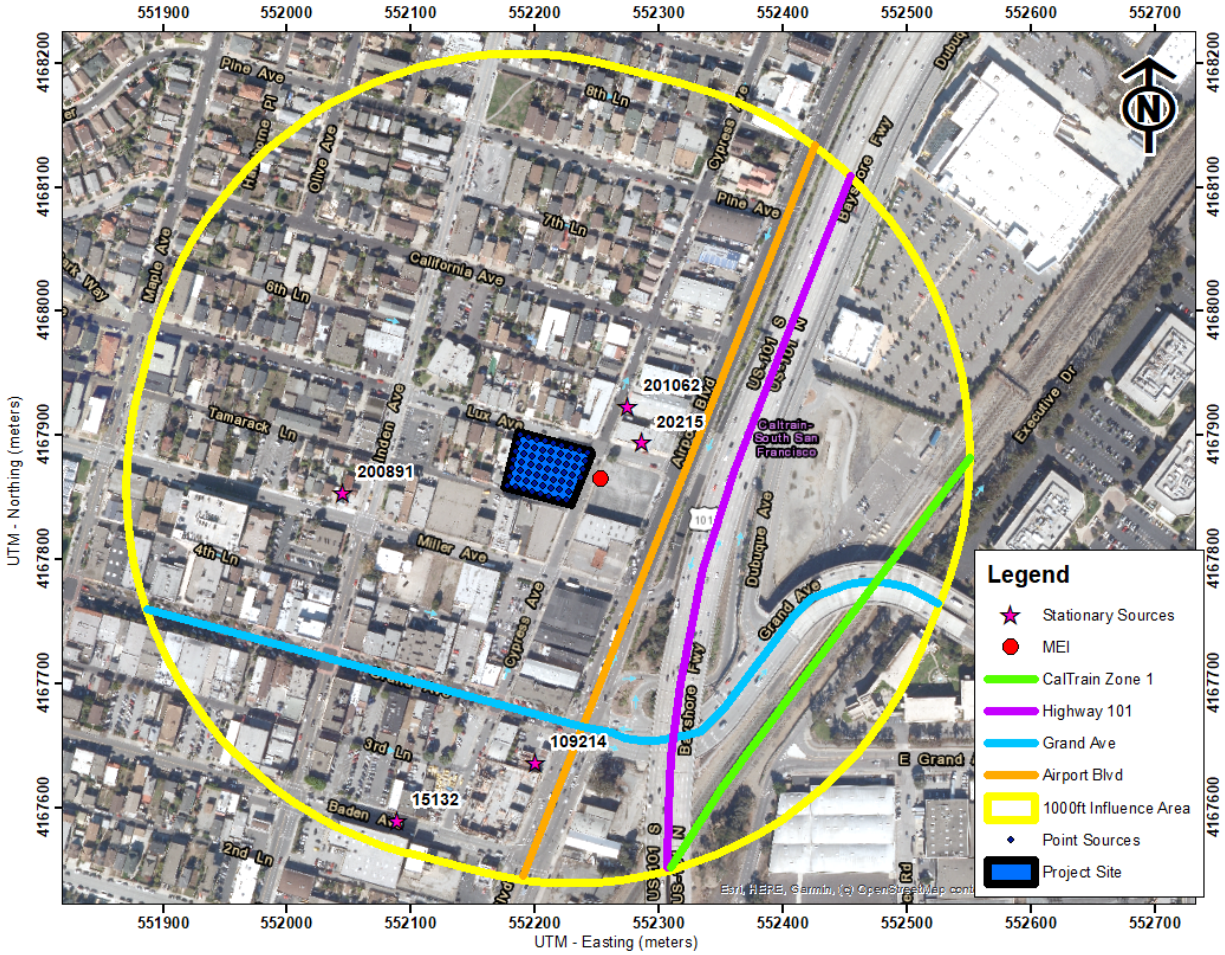


Cumulative Community Risks of all TAC Sources at the Offsite Project MEI

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.

In lieu of a project specific cumulative community risk assessment, the cumulative community risk assessments for nearby projects have been evaluated and applied to this analysis. The closest nearby project site is the VMAP – Miller Parcels B and C Combined project analysis performed by *Illingworth & Rodkin, Inc.* in December of 2017 (VMAP). The project site in this analysis is across Tamarack Lane, approximately 30 feet north, from the aforementioned VMAP project and, therefore, would have similar on-site exposure as the VMAP project. Further, since this project's off-site MEI is nearly equidistant from TAC sources (i.e., Airport Boulevard, Grand Avenue, Highway 101, and CalTrain) as the off-site MEI from the VMAP project, exposure to those TAC sources will be similar at each MEI.

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



Highways & Railways – U.S. Highway 101, CalTrain Zone 1

The project MEI is approximately 250 feet west of U.S. Highway 101 and approximately 700 feet northwest of CalTrain Zone 1. The VMAP project modeled impacts from U.S. 101 and Caltrain at slightly closer distances for VMAP Parcel A along Airport Blvd near U.S. 101. The project site and the MEI are setback further; therefore, the exposure from Highway 101 and Caltrain Zone 1 on this project's MEI are expected to be lower than the exposure modeled in the VMAP project. Traffic levels modeled for the VMAP project using 2014 Caltrans traffic counts are similar or lower than traffic levels on U.S. 101 in 2019 (pre-pandemic) and 2020 (during the pandemic). As such, the health risks from Highway 101 based on the VMAP project that affect this project MEI account for current traffic on the highway.

Local Roadways – Airport Boulevard & Grand Avenue

The project MEI is approximately 150 feet west of Airport Boulevard and approximately 575 feet Similar to Highway 101, the project MEI is a similar distance away from Airport Boulevard and Grand Avenue as the MEI in the VMAP project.

BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* geographic information system (GIS) map website.[12] This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. Five sources were identified using this tool, three auto body coating operations and two gas dispensing facilities. A stationary source information request was required as the BAAQMD GIS website did not provide screening risks and hazards for all sources.

The screening level risks and hazards provided by BAAQMD for the stationary sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines and Gasoline Dispending Facilities*. Community risk impacts from the stationary source upon the MEI are reported in Table 6.

Summary of Cumulative Health Risk Impact at Construction MEI

Table 6 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 annual $PM_{2.5}$ concentration does exceed the BAAQMD single-source and cumulative-source thresholds. However, with mitigation, the annual $PM_{2.5}$ concentration is reduced below both thresholds.

[12] BAAQMD, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65

Table 6. 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	Unmitigated	**62.82 (infant)**	**0.45**	0.07
	Mitigated	3.83 (infant)	0.07	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	***Yes***	*No*
	Mitigated	*No*	*No*	*No*
Cumulative Impacts				
Highway 101		8.24	0.3	0.01
CalTrain Zone 1		0.86	0.01	0.01
Airport Boulevard		1.82	0.04	0.01
Grand Avenue		0.75	0.02	0.03
NOD Auto Body Shop Inc (Facility ID #15132, Auto Body Coating Operation), MEI at 1000 feet		-	-	<0.01
NOD Auto Body Shop Inc (Facility ID #20215, Auto Body Coating Operation), MEI at 150 feet		-	-	<0.01
Unocal #1020—Grand Martco Inc (Facility ID #109214, Gas Dispensing Facility), MEI at 775 feet		0.54	-	<0.01
Chico's Service Station (Facility ID #200891, Gas Dispensing Facility), MEI at 670 feet		0.39	-	<0.01
A&K Supreme Auto (Facility ID #201062, Auto Body Coating Operation), MEI at 190 feet		-	-	<0.01
Cumulative Total	Unmitigated	75.42 (infant)	0.84	<0.18
	Mitigated	16.43 (infant)	0.46	<0.12
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated	*No*	***Yes***	*No*
	Mitigated	*No*	*No*	*No*

Additional Construction Mitigation for MM4.2-1

Implement the following measures to reduce diesel particulate matter emissions by 85 percent such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below TAC significance levels 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 PM (PM_{10} and $PM_{2.5}$), if feasible, otherwise,

    a. If use of Tier 4 equipment is not available, alternatively use 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 85 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

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

2. Alternatively, the applicant may develop another construction operations plan demonstrating that the construction equipment used on-site would achieve a reduction in construction diesel particulate matter emissions by 85 percent or greater. Elements of the plan could include a combination of some of the following measures:

    - Implementation of No. 1 above to use Tier 4 or alternatively fueled equipment,
    - Installation of electric power lines during early construction phases to avoid use of diesel generators and compressors,
    - Use of electrically-powered equipment,
    - Forklifts and aerial lifts used for exterior and interior building construction shall be electric or propane/natural gas powered,
    - Change in construction build-out plans to lengthen phases, and
    - Implementation of different building techniques that result in less diesel equipment usage.

    Such a construction operations plan would be subject to review by an air quality expert and approved by the City prior to construction.

Effectiveness of MM4.2-1

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 interim engines standards, BAAQMD best management practices for construction, and electrified welders were included. With these implemented, the project's cancer risk levels (assuming infant exposure) and annual $PM_{2.5}$ concentrations would be reduced to 3.83 per million with use of Tier 4 equipment. Assuming a lesser level of mitigation that achieves a 85-percent reduction, increased cancer risks would be reduced to below 10 chances per million. As a result, the project's construction risks would be reduced below the BAAQMD single-source thresholds.

Operational Air Quality Impacts and Mitigation Measures

Mitigation Measure MM4.2-2 Operational Air Pollutant Emissions

This mitigation measure requires quantification of operational emissions to demonstrate that adequate measures have been identified to reduce project air pollutant emissions. The CalEEMod model that was used to compute construction air pollutant emissions was also used to compute operational emissions. The model was run with default inputs for the project land use and types describe previously for the construction emissions. CalEEMod provided annual emissions in tons. These were divided by 365 days to compute average daily emissions. Table 7 reports operational emissions from the project. Operational emissions are below thresholds so no measures to reduce air pollutant emissions from project operation are required.

Table 7. Project Operation Air Pollutant Emissions

Description	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
2024 Annual emissions in tons	1.10	0.28	0.54	0.19
BAAQMD Thresholds (tons per year)	*10*	*10*	*15*	*10*
Average Daily Emissions (pounds per day)	5.7	1.5	3.0	1.0
BAAQMD Thresholds (pounds per day)	*54*	*54*	*82*	*54*
Exceed Threshold?	*No*	*No*	*No*	*No*

On-site Community Risk Assessment for TAC Sources - New Project Residences

Mitigation Measure MM4.2-3 TAC Sources Affecting the Project

In addition to evaluating health impact from project construction, a health risk assessment was completed to determine the impact that existing TAC sources would have on the new proposed sensitive receptors (residents) that the project would introduce. The same TAC sources identified above were used in this health risk assessment.[13]

Highways & Railways – U.S. Highway 101, CalTrain Zone 1

The highway and railway analysis for the project residents was conducted in the same manner as described above for evaluating the off-site MEI for construction impacts as part of MM4.2-1.

Local Roadways – Airport Boulevard & Grand Avenue

The roadway analysis for the project residents was conducted in the same manner as described above for evaluating the off-site MEI for construction impacts as part of MM4.2-1.

Stationary Sources

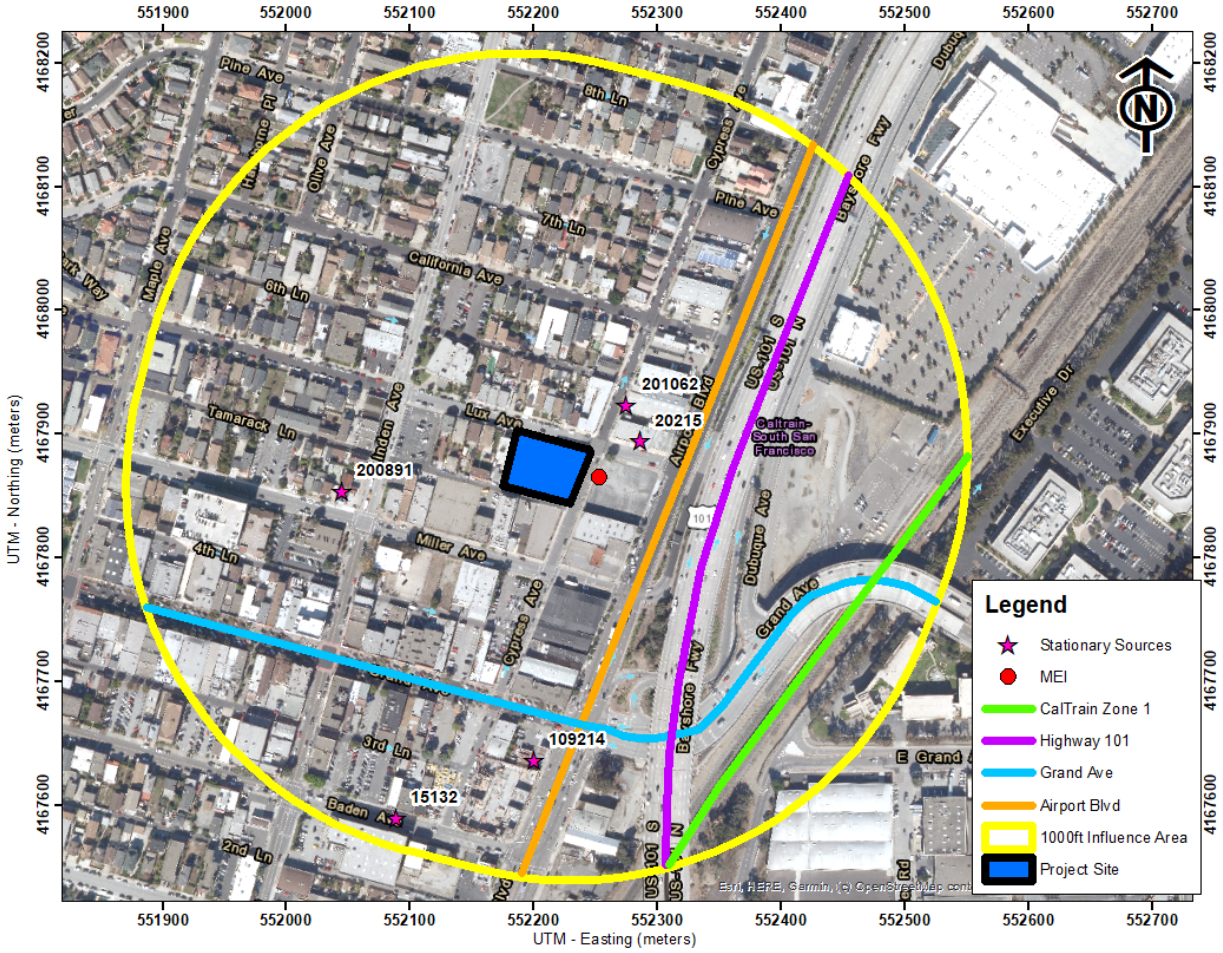
The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for evaluating the off-site MEI for construction impacts as part of MM4.2-1. Table 8 shows the health risk screening assessment results from the stationary sources.

Summary of Cumulative Community Risks at the Project Site

Community risk impacts from the existing and TAC sources upon the project site are reported in Table 8. 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, none of the sources exceed the single-source or cumulative-source thresholds.

[13] 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.

Figure 3. Project Site and Nearby Cumulative Sources



Additional Operational Mitigation Requirements under MM4.2-3

No additional measures are necessary since health risk levels do not exceed single- or cumulative-source thresholds at the project site where sensitive receptors would be located.

The 2019 Building Energy Efficiency Standards of the State's Building code (Title 24) require the installation of heating/cooling ventilation systems equipped with Minimum efficiency reporting value (MERV) 13, or equivalent. A properly operating ventilation system with MERV13 filtration and closed/sealed windows would reduce indoor particulate matter levels. The effect of these new building code requirements was not accounted for in this study. Thus, particulate matter levels and cancer risk for occupants of the project is expected to be lower than reported in Table 8.

Table 8. Impacts from Combined Sources to Project Site Receptors

Source	Maximum Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Maximum Hazard Index
Highway 101	8.24	<0.3	0.01
CalTrain Zone 1	1.18	0.01	0.01
Airport Boulevard	1.93	0.11	0.04
Grand Avenue	1.50	0.01	0.04
NOD Auto Body Shop Inc (Facility ID #15132, Auto Body Coating Operation), MEI at 1000 feet	-	-	<0.01
NOD Auto Body Shop Inc (Facility ID #20215, Auto Body Coating Operation), MEI at 150 feet	-	-	<0.01
Unocal #1020—Grand Martco Inc (Facility ID #109214, Gas Dispensing Facility), MEI at 775 feet	0.69	-	<0.01
Chico's Service Station (Facility ID #200891, Gas Dispensing Facility), MEI at 670 feet	0.88	-	<0.01
A&K Supreme Auto (Facility ID #201062, Auto Body Coating Operation), MEI at 190 feet	-	-	<0.01
BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	*No*	*No*	*No*
Cumulative Total	14.42	0.43	<0.15
BAAQMD Cumulative Source Threshold	***100***	***0.8***	***10.0***
Exceed Threshold?	*No*	*No*	*No*

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 EMFAC2021 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.[14] 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.[15] 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.[16] 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

[14] 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.
[15] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[16] 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: Bertolucci Parcel

See Equipment Type TAB for type, horsepower and load factor

Complete ALL Portions in Yellow

Project Size 99 Dwelling Units 0.584 total project acres disturbed

Based on 2021_08_06_Formal Submittal #3

119,257 s.f. residential

1,500 s.f. Quality Restaurant

s.f. office/commercial

acres - Outdoor use (common and patios)

22,995 s.f. parking garage 90 spaces

s.f. parking lot 9 spaces

Construction Hours 8 am to 5 pm

Pile Driving? Y/N?

Project include on-site GENERATOR OR FIRE PUMP during project OPERATION? Y/N? YES for fire pump

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower: _?? kw_____

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:**	**1/3/2023**	**Total phase:**	**20**			**Overall Import/Export Volumes**
		End Date:	**1/30/2023**					
1	Concrete/Industrial Saws	81	0.73	8		0	0	**Demolition Volume**
0	Excavators	158	0.38			0	0	Square footage of buildings to be demolished
1	Rubber-Tired Dozers	247	0.4	8		0	0	(*or* total tons to be hauled)
3	Tractors/Loaders/Backhoes	97	0.37	8		0	0	13,000 square feet *or* (includes both buildings and stories)
	Other Equipment?							_?_ Hauling volume (tons)
								Any pavement demolished and hauled? 365 tons (parking pavement)
	Site Preparation	**Start Date:**	**1/31/2023**	**Total phase:**	**3**			6,100 sf building
		End Date:	**2/2/2023**					6,800 sf building
1	Graders	187	0.41	8		0	0	
1	Rubber Tired Dozers	247	0.4	8		0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8		0	0	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**2/3/2023**	**Total phase:**	**6**			
		End Date:	**2/10/2023**					**Soil Hauling Volume**
	Excavators	158	0.38			0	0	Export volume = _9400_ cubic yards?
1	Graders	187	0.41	8		0	0	Import volume = _2000_ cubic yards?
1	Rubber Tired Dozers	247	0.4	8		0	0	
	Concrete/Industrial Saws	81	0.73			0	0	
2	Tractors/Loaders/Backhoes	97	0.37	8		0	0	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**2/11/2023**	**Total phase:**	**30**			
		End Date:	**3/24/2023**					
1	Tractor/Loader/Backhoe	97	0.37	6		0	0	
1	Excavators	158	0.38	6		0	0	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**2/11/2023**	**Total phase:**	**220**			**Cement Trucks? _?_ Total Round-Trips**
		End Date:	**12/15/2023**					
1	Cranes	231	0.29	8		0	0	Electric? (Y/N) ___ Otherwise assumed diesel
2	Forklifts	89	0.2	7		0	0	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8		0	0	Or temporary line power? (Y/N) ___
1	Tractors/Loaders/Backhoes	97	0.37	6		0	0	
3	Welders	46	0.45	8		0	0	
	Other Equipment?							
	Building - Interior/Architectural Coating	**Start Date:**	**12/9/2023**	**Total phase:**	**10**			
		End Date:	**12/22/2023**					
1	Air Compressors	78	0.48	6		0	0	
1	Aerial Lift	62	0.31	6		0	0	
	Other Equipment?							
	Paving	**Start Date:**	**12/16/2023**	**Total phase:**	**10**			
		Start Date:	**12/29/2023**					
1	Cement and Mortar Mixers	9	0.56	8		0	0	
1	Pavers	130	0.42	8		0	0	**Asphalt? 130 cubic yards or ____ round trips?**
1	Paving Equipment	132	0.36	8		0	0	
2	Rollers	80	0.38	8		0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8		0	0	
	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

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	**CO2e**	
Year	Tons				MT	
Construction Equipment						
2023	1.07	1.79	0.08	0.08	276.78	
EMFAC						
2023	0.03	0.21	0.01	0.01	171.64	
Total Construction Emissions by Year						
2023	1.10	2.00	0.09	0.08	448.42	
	Total Construction Emissions					
Tons	1.10	2.00	0.09	0.08	448.42	
Pounds/Workdays	*Average Daily Emissions*				Workdays	
2023	8.49	15.47	0.73	0.64		**259**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	8.49	15.47	0.73	0.64	0.00	
Average	8.49	15.47	0.73	0.64	0.00	259.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Bertolucci Parcel, SSF

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	90.00	Space	0.00	22,995.00	0
Parking Lot	9.00	Space	0.00	3,600.00	0
Quality Restaurant	1.50	1000sqft	0.00	1,500.00	0
Apartments Mid Rise	99.00	Dwelling Unit	0.58	119,257.00	283

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	Peninsula Clean Energy				
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 - Applicant provided unit amounts, lot acreage, and square footage

Construction Phase - Applicant provided phase lengths.

Off-road Equipment - add aerial lift

Off-road Equipment - Applicant provided construction equipment info

Off-road Equipment - Applicant provided construction equipment info

Off-road Equipment - Applicant provided construction equipment info

Off-road Equipment - Applicant provided construction equipment info

Off-road Equipment - Applicant provided construction equipment info

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Applicant provided construction equipment info

Off-road Equipment - add trenching equipment

Trips and VMT - All trips added to EMFAC2021

Demolition - 13,000 sf and 365 tons

Grading -

Construction Off-road Equipment Mitigation - All equipment t4i, BMP

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
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	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	100.00	220.00
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	2.00	6.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	1.00	3.00
tblGrading	MaterialExported	0.00	9,400.00
tblGrading	MaterialImported	0.00	2,000.00
tblLandUse	LandUseSquareFeet	36,000.00	22,995.00
tblLandUse	LandUseSquareFeet	99,000.00	119,257.00
tblLandUse	LotAcreage	0.81	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	0.03	0.00
tblLandUse	LotAcreage	2.61	0.58
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	59.00	0.00
tblTripsAndVMT	HaulingTripNumber	1,425.00	0.00
tblTripsAndVMT	VendorTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	83.00	0.00
tblTripsAndVMT	WorkerTripNumber	17.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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					
2023	1.0714	1.7926	1.8698	3.2900e-003	0.0389	0.0812	0.1201	0.0165	0.0774	0.0939	0.0000	275.3711	275.3711	0.0565	0.0000	276.7839
Maximum	**1.0714**	**1.7926**	**1.8698**	**3.2900e-003**	**0.0389**	**0.0812**	**0.1201**	**0.0165**	**0.0774**	**0.0939**	**0.0000**	**275.3711**	**275.3711**	**0.0565**	**0.0000**	**276.7839**

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					
2023	0.8986	0.8677	1.5581	2.4500e-003	0.0175	3.8900e-003	0.0214	7.4100e-003	3.8900e-003	0.0113	0.0000	213.2580	213.2580	0.0497	0.0000	214.5015
Maximum	**0.8986**	**0.8677**	**1.5581**	**2.4500e-003**	**0.0175**	**3.8900e-003**	**0.0214**	**7.4100e-003**	**3.8900e-003**	**0.0113**	**0.0000**	**213.2580**	**213.2580**	**0.0497**	**0.0000**	**214.5015**

	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	**16.13**	**51.60**	**16.67**	**25.53**	**55.00**	**95.21**	**82.19**	**55.04**	**94.98**	**87.97**	**0.00**	**22.56**	**22.56**	**11.98**	**0.00**	**22.50**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-3-2023**	**4-2-2023**	0.5377	0.2751
2	**4-3-2023**	**7-2-2023**	0.4985	0.2077
3	**7-3-2023**	**9-30-2023**	0.4930	0.2054
		Highest	0.5377	0.2751

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.8092	0.0137	1.0502	6.6000e-004		0.0491	0.0491		0.0491	0.0491	4.5134	3.0564	7.5698	8.4100e-003	3.0000e-004	7.8683
Energy	5.8600e-003	0.0508	0.0267	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	58.0138	58.0138	1.1100e-003	1.0600e-003	58.3586
Mobile	0.2325	0.2119	2.1794	4.4100e-003	0.4877	2.9400e-003	0.4907	0.1303	2.7300e-003	0.1330	0.0000	406.7895	406.7895	0.0288	0.0185	413.0316
Waste						0.0000	0.0000		0.0000	0.0000	9.5223	0.0000	9.5223	0.5628	0.0000	23.5911
Water						0.0000	0.0000		0.0000	0.0000	2.1908	0.0000	2.1908	0.2250	5.3100e-003	9.3996
Total	**1.0476**	**0.2765**	**3.2564**	**5.3900e-003**	**0.4877**	**0.0560**	**0.5438**	**0.1303**	**0.0558**	**0.1861**	**16.2265**	**467.8597**	**484.0862**	**0.8261**	**0.0252**	**512.2491**

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	0.8092	0.0137	1.0502	6.6000e-004		0.0491	0.0491		0.0491	0.0491	4.5134	3.0564	7.5698	8.4100e-003	3.0000e-004	7.8683
Energy	5.8600e-003	0.0508	0.0267	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	58.0138	58.0138	1.1100e-003	1.0600e-003	58.3586
Mobile	0.2325	0.2119	2.1794	4.4100e-003	0.4877	2.9400e-003	0.4907	0.1303	2.7300e-003	0.1330	0.0000	406.7895	406.7895	0.0288	0.0185	413.0316

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Waste						0.0000	0.0000		0.0000	0.0000	9.5223	0.0000	9.5223	0.5628	0.0000	23.5911
Water						0.0000	0.0000		0.0000	0.0000	2.1908	0.0000	2.1908	0.2250	5.3100e-003	9.3996
Total	**1.0476**	**0.2765**	**3.2564**	**5.3900e-003**	**0.4877**	**0.0560**	**0.5438**	**0.1303**	**0.0558**	**0.1861**	**16.2265**	**467.8597**	**484.0862**	**0.8261**	**0.0252**	**512.2491**

	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	1/3/2023	1/30/2023	5	20	
2	Site Preparation	Site Preparation	1/31/2023	2/2/2023	5	3	
3	Grading	Grading	2/3/2023	2/10/2023	5	6	
4	Trenching	Trenching	2/11/2023	3/24/2023	5	30	
5	Building Construction	Building Construction	2/11/2023	12/15/2023	5	220	
6	Architectural Coating	Architectural Coating	12/9/2023	12/22/2023	5	10	
7	Paving	Paving	12/16/2023	12/29/2023	5	10	

Acres of Grading (Site Preparation Phase): 3

Acres of Grading (Grading Phase): 6

Acres of Paving: 0

Residential Indoor: 241,495; Residential Outdoor: 80,498; Non-Residential Indoor: 2,250; Non-Residential Outdoor: 750; Striped Parking Area: 1,596

OffRoad Equipment

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Excavators	1	6.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	6.00	63	0.31
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Demolition	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

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					6.4000e-003	0.0000	6.4000e-003	9.7000e-004	0.0000	9.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0147	0.1432	0.1346	2.4000e-004		6.7700e-003	6.7700e-003		6.3300e-003	6.3300e-003	0.0000	21.0866	21.0866	5.3500e-003	0.0000	21.2202
Total	**0.0147**	**0.1432**	**0.1346**	**2.4000e-004**	**6.4000e-003**	**6.7700e-003**	**0.0132**	**9.7000e-004**	**6.3300e-003**	**7.3000e-003**	**0.0000**	**21.0866**	**21.0866**	**5.3500e-003**	**0.0000**	**21.2202**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					2.8800e-003	0.0000	2.8800e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6300e-003	0.0854	0.1542	2.4000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	21.0865	21.0865	5.3500e-003	0.0000	21.2202
Total	**4.6300e-003**	**0.0854**	**0.1542**	**2.4000e-004**	**2.8800e-003**	**3.7000e-004**	**3.2500e-003**	**4.4000e-004**	**3.7000e-004**	**8.1000e-004**	**0.0000**	**21.0865**	**21.0865**	**5.3500e-003**	**0.0000**	**21.2202**

Mitigated Construction Off-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0106	0.0000	0.0106	5.1400e-003	0.0000	5.1400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8300e-003	0.0200	0.0106	3.0000e-005		8.2000e-004	8.2000e-004		7.6000e-004	7.6000e-004	0.0000	2.4078	2.4078	7.8000e-004	0.0000	2.4273
Total	**1.8300e-003**	**0.0200**	**0.0106**	**3.0000e-005**	**0.0106**	**8.2000e-004**	**0.0114**	**5.1400e-003**	**7.6000e-004**	**5.9000e-003**	**0.0000**	**2.4078**	**2.4078**	**7.8000e-004**	**0.0000**	**2.4273**

Unmitigated Construction Off-Site

Date: 1/31/2022 2:13 PM

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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					4.7800e-003	0.0000	4.7800e-003	2.3100e-003	0.0000	2.3100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	8.0200e-003	0.0156	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.4078	2.4078	7.8000e-004	0.0000	2.4273
Total	**4.8000e-004**	**8.0200e-003**	**0.0156**	**3.0000e-005**	**4.7800e-003**	**4.0000e-005**	**4.8200e-003**	**2.3100e-003**	**4.0000e-005**	**2.3500e-003**	**0.0000**	**2.4078**	**2.4078**	**7.8000e-004**	**0.0000**	**2.4273**

Mitigated Construction Off-Site

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0219	0.0000	0.0219	0.0104	0.0000	0.0104	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1100e-003	0.0446	0.0278	6.0000e-005		1.8700e-003	1.8700e-003		1.7200e-003	1.7200e-003	0.0000	5.6364	5.6364	1.8200e-003	0.0000	5.6819
Total	**4.1100e-003**	**0.0446**	**0.0278**	**6.0000e-005**	**0.0219**	**1.8700e-003**	**0.0238**	**0.0104**	**1.7200e-003**	**0.0121**	**0.0000**	**5.6364**	**5.6364**	**1.8200e-003**	**0.0000**	**5.6819**

Unmitigated Construction Off-Site

Date: 1/31/2022 2:13 PM

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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					9.8500e-003	0.0000	9.8500e-003	4.6700e-003	0.0000	4.6700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1600e-003	0.0201	0.0382	6.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	5.6364	5.6364	1.8200e-003	0.0000	5.6819
Total	**1.1600e-003**	**0.0201**	**0.0382**	**6.0000e-005**	**9.8500e-003**	**1.0000e-004**	**9.9500e-003**	**4.6700e-003**	**1.0000e-004**	**4.7700e-003**	**0.0000**	**5.6364**	**5.6364**	**1.8200e-003**	**0.0000**	**5.6819**

Mitigated Construction Off-Site

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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 - 2023

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	3.8300e-003	0.0347	0.0618	9.0000e-005		1.7100e-003	1.7100e-003		1.5700e-003	1.5700e-003	0.0000	8.1818	8.1818	2.6500e-003	0.0000	8.2480
Total	**3.8300e-003**	**0.0347**	**0.0618**	**9.0000e-005**		**1.7100e-003**	**1.7100e-003**		**1.5700e-003**	**1.5700e-003**	**0.0000**	**8.1818**	**8.1818**	**2.6500e-003**	**0.0000**	**8.2480**

Unmitigated Construction Off-Site

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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	1.5000e-003	0.0409	0.0704	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.1818	8.1818	2.6500e-003	0.0000	8.2480
Total	**1.5000e-003**	**0.0409**	**0.0704**	**9.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**8.1818**	**8.1818**	**2.6500e-003**	**0.0000**	**8.2480**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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 - 2023

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	0.1885	1.4986	1.5636	2.7500e-003		0.0675	0.0675		0.0647	0.0647	0.0000	228.4723	228.4723	0.0432	0.0000	229.5525
Total	**0.1885**	**1.4986**	**1.5636**	**2.7500e-003**		**0.0675**	**0.0675**		**0.0647**	**0.0647**	**0.0000**	**228.4723**	**228.4723**	**0.0432**	**0.0000**	**229.5525**

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					

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0361	0.6668	1.2009	1.9100e-003		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003	0.0000	166.3593	166.3593	0.0364	0.0000	167.2700
Total	**0.0361**	**0.6668**	**1.2009**	**1.9100e-003**		**2.9100e-003**	**2.9100e-003**		**2.9100e-003**	**2.9100e-003**	**0.0000**	**166.3593**	**166.3593**	**0.0364**	**0.0000**	**167.2700**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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 Architectural Coating - 2023

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	0.8529					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	8.5100e-003	0.0132	2.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	1.8299	1.8299	2.6000e-004	0.0000	1.8362
Total	**0.8540**	**8.5100e-003**	**0.0132**	**2.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**1.8299**	**1.8299**	**2.6000e-004**	**0.0000**	**1.8362**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.8529					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3000e-004	8.8400e-003	0.0139	2.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	1.8299	1.8299	2.6000e-004	0.0000	1.8362
Total	**0.8533**	**8.8400e-003**	**0.0139**	**2.0000e-005**		**1.6000e-004**	**1.6000e-004**		**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.8299**	**1.8299**	**2.6000e-004**	**0.0000**	**1.8362**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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 Paving - 2023

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	4.4000e-003	0.0431	0.0584	9.0000e-005		2.1700e-003	2.1700e-003		2.0000e-003	2.0000e-003	0.0000	7.7564	7.7564	2.4600e-003	0.0000	7.8179
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.4000e-003**	**0.0431**	**0.0584**	**9.0000e-005**		**2.1700e-003**	**2.1700e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**7.7564**	**7.7564**	**2.4600e-003**	**0.0000**	**7.8179**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	1.4800e-003	0.0376	0.0649	9.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.7564	7.7564	2.4600e-003	0.0000	7.8178
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4800e-003**	**0.0376**	**0.0649**	**9.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.7564**	**7.7564**	**2.4600e-003**	**0.0000**	**7.8178**

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

Bertolucci Parcel, SSF - San Mateo County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.2325	0.2119	2.1794	4.4100e-003	0.4877	2.9400e-003	0.4907	0.1303	2.7300e-003	0.1330	0.0000	406.7895	406.7895	0.0288	0.0185	413.0316
Unmitigated	0.2325	0.2119	2.1794	4.4100e-003	0.4877	2.9400e-003	0.4907	0.1303	2.7300e-003	0.1330	0.0000	406.7895	406.7895	0.0288	0.0185	413.0316

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	538.56	486.09	404.91	1,182,453	1,182,453
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Quality Restaurant	125.76	135.06	107.96	147,731	147,731
Total	664.32	621.15	512.87	1,330,184	1,330,184

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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 with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Quality Restaurant	9.50	7.30	7.30	12.00	69.00	19.00	38	18	44

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.473689	0.072335	0.232457	0.144246	0.025248	0.006233	0.010124	0.002125	0.001469	0.000591	0.028445	0.000434	0.002601
Enclosed Parking with Elevator	0.473689	0.072335	0.232457	0.144246	0.025248	0.006233	0.010124	0.002125	0.001469	0.000591	0.028445	0.000434	0.002601
Parking Lot	0.473689	0.072335	0.232457	0.144246	0.025248	0.006233	0.010124	0.002125	0.001469	0.000591	0.028445	0.000434	0.002601
Quality Restaurant	0.473689	0.072335	0.232457	0.144246	0.025248	0.006233	0.010124	0.002125	0.001469	0.000591	0.028445	0.000434	0.002601

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	5.8600e-003	0.0508	0.0267	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	58.0138	58.0138	1.1100e-003	1.0600e-003	58.3586	
NaturalGas Unmitigated	5.8600e-003	0.0508	0.0267	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	58.0138	58.0138	1.1100e-003	1.0600e-003	58.3586	

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	835858	4.5100e-003	0.0385	0.0164	2.5000e-004		3.1100e-003	3.1100e-003		3.1100e-003	3.1100e-003	0.0000	44.6046	44.6046	8.5000e-004	8.2000e-004	44.8696
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	251280	1.3500e-003	0.0123	0.0104	7.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	13.4093	13.4093	2.6000e-004	2.5000e-004	13.4889
Total		**5.8600e-003**	**0.0508**	**0.0267**	**3.2000e-004**		**4.0500e-003**	**4.0500e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**58.0138**	**58.0138**	**1.1100e-003**	**1.0700e-003**	**58.3586**

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	835858	4.5100e-003	0.0385	0.0164	2.5000e-004		3.1100e-003	3.1100e-003		3.1100e-003	3.1100e-003	0.0000	44.6046	44.6046	8.5000e-004	8.2000e-004	44.8696
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	251280	1.3500e-003	0.0123	0.0104	7.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	13.4093	13.4093	2.6000e-004	2.5000e-004	13.4889
Total		**5.8600e-003**	**0.0508**	**0.0267**	**3.2000e-004**		**4.0500e-003**	**4.0500e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**58.0138**	**58.0138**	**1.1100e-003**	**1.0700e-003**	**58.3586**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	384751	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	125093	0.0000	0.0000	0.0000	0.0000
Parking Lot	1260	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	43035	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	384751	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	125093	0.0000	0.0000	0.0000	0.0000
Parking Lot	1260	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	43035	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	0.8092	0.0137	1.0502	6.6000e-004		0.0491	0.0491		0.0491	0.0491	4.5134	3.0564	7.5698	8.4100e-003	3.0000e-004	7.8683
Unmitigated	0.8092	0.0137	1.0502	6.6000e-004		0.0491	0.0491		0.0491	0.0491	4.5134	3.0564	7.5698	8.4100e-003	3.0000e-004	7.8683

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0853					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4733					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.2284	5.2600e-003	0.3145	6.3000e-004		0.0450	0.0450		0.0450	0.0450	4.5134	1.8539	6.3672	7.2500e-003	3.0000e-004	6.6368
Landscaping	0.0222	8.4700e-003	0.7357	4.0000e-005		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	1.2026	1.2026	1.1600e-003	0.0000	1.2315
Total	**0.8092**	**0.0137**	**1.0502**	**6.7000e-004**		**0.0491**	**0.0491**		**0.0491**	**0.0491**	**4.5134**	**3.0564**	**7.5698**	**8.4100e-003**	**3.0000e-004**	**7.8683**

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	0.0853					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4733					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.2284	5.2600e-003	0.3145	6.3000e-004		0.0450	0.0450		0.0450	0.0450	4.5134	1.8539	6.3672	7.2500e-003	3.0000e-004	6.6368
Landscaping	0.0222	8.4700e-003	0.7357	4.0000e-005		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	1.2026	1.2026	1.1600e-003	0.0000	1.2315

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Total	**0.8092**	**0.0137**	**1.0502**	**6.7000e-004**		**0.0491**	**0.0491**		**0.0491**	**0.0491**	**4.5134**	**3.0564**	**7.5698**	**8.4100e-003**	**3.0000e-004**	**7.8683**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.1908	0.2250	5.3100e-003	9.3996
Unmitigated	2.1908	0.2250	5.3100e-003	9.3996

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	6.45025 / 4.06646	2.0464	0.2102	4.9600e-003	8.7798
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.455301 / 0.0290617	0.1445	0.0148	3.5000e-004	0.6197
Total		**2.1908**	**0.2250**	**5.3100e-003**	**9.3996**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	6.45025 / 4.06646	2.0464	0.2102	4.9600e-003	8.7798
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	0.455301 / 0.0290617	0.1445	0.0148	3.5000e-004	0.6197
Total		**2.1908**	**0.2250**	**5.3100e-003**	**9.3996**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.5223	0.5628	0.0000	23.5911
Unmitigated	9.5223	0.5628	0.0000	23.5911

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	45.54	9.2442	0.5463	0.0000	22.9021
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.37	0.2781	0.0164	0.0000	0.6890
Total		**9.5223**	**0.5628**	**0.0000**	**23.5911**

Mitigated

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	45.54	9.2442	0.5463	0.0000	22.9021
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Quality Restaurant	1.37	0.2781	0.0164	0.0000	0.6890
Total		**9.5223**	**0.5628**	**0.0000**	**23.5911**

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

11.0 Vegetation

Attachment 3: EMFAC2021 Calculations

Summary of Construction Traffic Emissions (EMFAC2021)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2	CH4	N2O	CO2e
					Tons							*Metric Tons*		
Criteria Pollutants														
2023	0.0281	0.2112	0.3699	0.0017	0.0875	0.0128	0.1003	0.0132	0.0052	0.0184	165.9230	0.0161	0.0178	171.6371
Toxic Air Contaminants (1.0 Mile Trip Length)														
2023	0.0233	0.0495	0.1225	0.0002	0.0080	0.0011	0.0091	0.0012	0.0005	0.0017	18.3056	0.0035	0.0025	19.1261

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	13	0	260	0	96	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	2808	0	1920
Site Preparation	8	0	24	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	259.2	0	0
Grading	10	0	60	0	1425	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	648	0	28500
Trenching/Foundation	5	0	150	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1620	0	0
Paving	15	0	150	0	31	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1620	0	620
Building Construction	83	15	18260	3300	210	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	197208	24090	4200
Architectural Coating	17	0	170	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1836	0	0

Number of Days Per Year					
2023	1/3/23	12/29/23	361	259	
			361	**259**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	1/3/2023	1/30/2023	5	20
Site Preparation	1/31/2023	2/2/2023	5	3
Grading	2/3/2023	2/10/2023	5	6
Trenching/Foundation	2/11/2023	3/24/2023	5	30
Paving	12/16/2023	12/29/2023	5	10
Building Construction	2/11/2023	12/15/2023	5	220
Architectural Coating	12/9/2023	12/22/2023	5	10

Source: EMFAC2021 (v1.0.1) Emission Rates
Region Type: County
Region: San Mateo
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMBW	PM2.5_PMTW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMBW	PM10_PMTW	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_HOTSOAK	ROG_RUNLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_DIURN	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
San Mateo	2023	HHDT	Aggregate	Aggregate	Gasoline	4.303891	593.3265	593.3265	0	86.11225	4.056089	0	0.0028	0.00142	0	0.000834	0.005	0.031149	0.001544	0	0.000907	0.02	0.088996	2258.184	0	54.48492	0.114491	0	0.000118	0.150249	0	0.000135	0.581376	0	0.000638	0.041838	0.335524	2.939257	0.848342	0	0.000699	0.041838	0.335524	2.939257	0.845	33.28789	0	6.069294	0.022324	0	0.000539
San Mateo	2023	HHDT	Aggregate	Aggregate	Diesel	1295.72	119079.6	119079.6	0	14027.66	2.889862	47.02809	2.876808	0.025432	0.037858	0	0.008609	0.030943	0.026582	0.03957	0	0.034434	0.08841	1843.774	8291.615	0	0.001322	0.156217	0	0.290487	1.306347	0	0.028463	3.363316	0	0	0	0	0.032403	3.828879	0	0	0	0	0	0.032403	46.58006	0	0.017459	0.078517	0	0
San Mateo	2023	HHDT	Aggregate	Aggregate	Electricity	0.738781	40.81187	0	40.81187	9.636589	0	0	0	0	0	0	0	0	0	0	0	0.034663	0.039372	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	HHDT	Aggregate	Aggregate	Natural Ga	157.5655	10602.72	10602.72	0	1067.368	1.650268	10.1232	0	0.001897	0.012167	0	0	0.009	0.058575	0.002063	0.013232	0	0.036	0.167357	1522.593	8490.533	0	3.343054	25.56751	0	0.310391	1.730851	0	0.076973	0.418135	0	0	0	0	3.445109	26.1537	0	0	0	0	0	0.73711	17.41229	66.41256	0	0	0	0	0
San Mateo	2023	LDA	Aggregate	Aggregate	Gasoline	240378.8	7727537	7727537	0	1128355	0.042338	0	0.260506	0.001198	0	0.002031	0.002	0.002348	0.001303	0	0.002208	0.008	0.006708	278.3785	0	70.81713	0.002267	0	0.072534	0.004517	0	0.032351	0.008874	0	0.341649	0.087062	0.222247	1.324707	0.012948	0	0.374061	0.087062	0.222247	1.324707	0.035408	0.677749	0	3.395649	0.002752	0	0.0007
San Mateo	2023	LDA	Aggregate	Aggregate	Diesel	833.7612	19906.52	19906.52	0	3528.191	0.213764	0	0	0.014362	0	0	0.002	0.002398	0.015012	0	0	0.008	0.006851	234.8149	0	0	0.001164	0	0	0.036995	0	0	0.02507	0	0	0	0	0	0.02854	0	0	0	0	0	0	0.0031	0.317118	0	0	0.002225	0	0
San Mateo	2023	LDA	Aggregate	Aggregate	Electricity	16299	630419.6	0	630419.6	81240.99	0	0	0	0	0	0	0.002	0.001529	0	0	0	0.008	0.00437	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	LDA	Aggregate	Aggregate	Plug-in Hyb	6930.414	264587.6	131767.9	132819.8	28657.26	0.003199	0	0.117199	0.000615	0	0.002065	0.002	0.001318	0.000669	0	0.002246	0.008	0.003766	134.3501	0	65.86248	0.000415	0	0.042451	0.000556	0	0.020334	0.001345	0	0.176635	0.03705	0.032896	0.392427	0.001962	0	0.193393	0.03705	0.032896	0.392427	0.019696	0.200492	0	1.37819	0.001328	0	0.000651
San Mateo	2023	LDT1	Aggregate	Aggregate	Gasoline	24557.61	732297.8	732297.8	0	111855.3	0.11638	0	0.364578	0.001649	0	0.002601	0.002	0.002829	0.001794	0	0.002828	0.008	0.008082	326.1114	0	85.73673	0.005448	0	0.099842	0.008499	0	0.037022	0.024289	0	0.513929	0.14557	0.416379	2.294434	0.035435	0	0.562687	0.14557	0.416379	2.294434	0.037022	1.217988	0	5.093009	0.003224	0	0.000848
San Mateo	2023	LDT1	Aggregate	Aggregate	Diesel	7.655601	101.9185	101.9185	0	22.20173	1.676086	0	0	0.239368	0	0	0.002	0.003332	0.250191	0	0	0.008	0.00952	418.3389	0	0	0.014739	0	0	0.065909	0	0	0.317327	0	0	0	0	0	0.361255	0	0	0	0	0	0	0.0031	1.688168	0	0	0.003964	0	0
San Mateo	2023	LDT1	Aggregate	Aggregate	Electricity	74.62331	2574.77	0	2574.77	357.9526	0	0	0	0	0	0	0.002	0.001535	0	0	0	0.008	0.004386	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	LDT1	Aggregate	Aggregate	Plug-in Hyb	34.67073	1451.31	668.3078	783.0024	143.3635	0.002958	0	0.117199	0.000383	0	0.001401	0.002	0.001331	0.000416	0	0.001524	0.008	0.003802	124.2265	0	72.42832	0.000385	0	0.042531	0.000515	0	0.020414	0.001243	0	0.176635	0.024383	0.02158	0.274849	0.001814	0	0.193393	0.024383	0.02158	0.274849	0.01934	0.185385	0	1.37819	0.001228	0	0.000716
San Mateo	2023	LDT2	Aggregate	Aggregate	Gasoline	139222.3	4716888	4716888	0	668266.1	0.05408	0	0.29713	0.001207	0	0.001949	0.002	0.002716	0.001313	0	0.002119	0.008	0.007759	339.1094	0	86.14007	0.00237	0	0.075845	0.004959	0	0.034716	0.009113	0	0.347984	0.063629	0.160781	1.007437	0.013297	0	0.380999	0.063629	0.160781	1.007437	0.037748	0.693563	0	3.480515	0.003352	0	0.000852
San Mateo	2023	LDT2	Aggregate	Aggregate	Diesel	541.6894	18280.98	18280.98	0	2609.031	0.042759	0	0	0.004694	0	0	0.002	0.002739	0.004906	0	0	0.008	0.007825	314.2391	0	0	0.000594	0	0	0.049508	0	0	0.012791	0	0	0	0	0	0.014562	0	0	0	0	0	0	0.0031	0.121058	0	0	0.002978	0	0
San Mateo	2023	LDT2	Aggregate	Aggregate	Electricity	855.0521	26877.43	0	26877.43	4389.934	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	LDT2	Aggregate	Aggregate	Plug-in Hyb	1293.229	52235.96	24959.1	27276.86	5347.502	0.00307	0	0.117199	0.000478	0	0.001688	0.002	0.001325	0.00052	0	0.001836	0.008	0.003785	128.9014	0	78.74622	0.000399	0	0.042537	0.000535	0	0.02042	0.00129	0	0.176635	0.025663	0.02377	0.299211	0.001883	0	0.193393	0.025663	0.02377	0.299211	0.020047	0.192361	0	1.37819	0.001274	0	0.000778
San Mateo	2023	LHDT1	Aggregate	Aggregate	Gasoline	10572.08	392533.1	392533.1	0	157508.2	0.12528	0.035112	0.59784	0.00142	0	0.000253	0.002	0.0273	0.001545	0	0.000275	0.008	0.078	853.4932	117.883	26.97693	0.006321	0.111177	0.030421	0.00715	0.002997	0.050012	0.03091	0.4025	0.148384	0.036924	0.198922	2.014404	0.045104	0.587327	0.162462	0.036924	0.198922	2.014404	0.044937	0.986439	3.761565	3.318076	0.008438	0.001165	0.000267
San Mateo	2023	LHDT1	Aggregate	Aggregate	Diesel	4577.109	179686.5	179686.5	0	57574.27	1.224717	1.76206	0	0.0273	0.026942	0	0.003	0.0273	0.028534	0.02816	0	0.012	0.078	630.6192	129.0392	0	0.006697	0.005098	0	0.099354	0.02033	0	0.144187	0.10976	0	0	0	0	0.164147	0.124954	0	0	0	0	0	0.184546	0.371953	0.909745	0	0.005975	0.001223	0	0
San Mateo	2023	LHDT2	Aggregate	Aggregate	Gasoline	1231.236	43549.94	43549.94	0	18343.59	0.144	0.03443	0.605262	0.001368	0	0.000226	0.002	0.03185	0.001487	0	0.000246	0.008	0.091	963.6905	136.6851	25.60031	0.005686	0.108022	0.030291	0.008533	0.002829	0.048554	0.026382	0.394722	0.148891	0.038757	0.204501	2.085419	0.038496	0.575977	0.163017	0.038757	0.204501	2.085419	0.044989	0.878989	3.762499	3.300689	0.009527	0.001351	0.000253
San Mateo	2023	LHDT2	Aggregate	Aggregate	Diesel	1952.709	77798.97	77798.97	0	24562.62	0.883685	1.679482	0	0.023677	0.026872	0	0.003	0.03185	0.024747	0.028087	0	0.012	0.091	747.9998	204.9987	0	0.006098	0.005098	0	0.117848	0.032298	0	0.131288	0.10976	0	0	0	0	0.149463	0.124954	0	0	0	0	0	0.196309	0.303972	0.909745	0	0.007088	0.001942	0	0
San Mateo	2023	MCY	Aggregate	Aggregate	Gasoline	12536.77	73820.04	73820.04	0	2507.354	0.537143	0	0.136291	0.001883	0	0.003663	0.001	0.0042	0.002012	0	0.003894	0.004	0.012	187.6396	0	47.90752	0.151085	0	0.181429	0.037735	0	0.008068	0.98245	0	1.347169	3.555217	3.717102	3.435381	1.181139	0	1.464498	3.555217	3.717102	3.435381	0.008844	11.57445	0	7.838613	0.001855	0	0.000474
San Mateo	2023	MDV	Aggregate	Aggregate	Gasoline	78398.02	2704273	2704273	0	374408	0.068743	0	0.362909	0.001222	0	0.002069	0.002	0.002734	0.001329	0	0.002251	0.008	0.00781	408.872	0	104.3819	0.002844	0	0.089064	0.005703	0	0.037349	0.01161	0	0.437746	0.072395	0.194625	1.190411	0.016926	0	0.479274	0.072395	0.194625	1.190411	0.038092	0.747341	0	3.739188	0.004042	0	0.001032
San Mateo	2023	MDV	Aggregate	Aggregate	Diesel	1107.903	37908.13	37908.13	0	5305.818	0.04176	0	0	0.004328	0	0	0.002	0.002738	0.004524	0	0	0.008	0.007965	410.1053	0	0	0.000449	0	0	0.064612	0	0	0.009665	0	0	0	0	0	0.011002	0	0	0	0	0	0	0.0031	0.175602	0	0	0.003886	0	0
San Mateo	2023	MDV	Aggregate	Aggregate	Electricity	906.5115	28548.82	0	28548.82	4657.021	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004354	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	MDV	Aggregate	Aggregate	Plug-in Hyb	678.1174	27547.88	13448.47	14099.41	2804.015	0.003136	0	0.117199	0.000578	0	0.002002	0.002	0.001322	0.000628	0	0.002177	0.008	0.003776	131.6991	0	97.50736	0.000409	0	0.04268	0.00055	0	0.020553	0.001318	0	0.176635	0.027976	0.026258	0.325091	0.001923	0	0.193393	0.027976	0.026258	0.325091	0.020504	0.196536	0	1.37819	0.001302	0	0.000964
San Mateo	2023	MH	Aggregate	Aggregate	Gasoline	774.8115	7442.976	7442.976	0	77.51215	0.375927	0	0.404893	0.001719	0	0.000436	0.003	0.015756	0.001869	0	0.000474	0.012	0.045017	1947.17	0	31.89355	0.01417	0	0.038105	0.023764	0	0.042528	0.661382	0	0.16244	11.11371	0.261936	3.902966	0.089569	0	0.177852	11.11371	0.261936	3.902966	0.044861	1.492455	0	3.64337	0.01925	0	0.000315
San Mateo	2023	MH	Aggregate	Aggregate	Diesel	328.5822	3487.262	3487.262	0	32.85822	3.229197	0	0	0.055455	0	0	0.004	0.015675	0.057962	0	0	0.016	0.044785	1085.349	0	0	0.004377	0	0	0.170997	0	0	0.094242	0	0	0	0	0	0.107288	0	0	0	0	0	0	0.185977	0.297993	0	0	0.010284	0	0
San Mateo	2023	MHDT	Aggregate	Aggregate	Gasoline	780.1924	45998.29	45998.29	0	15610.09	0.48063	0.088485	0.45368	0.001377	0	0.000542	0.003	0.015756	0.001498	0	0.00059	0.012	0.045017	1763.945	530.3326	46.39494	0.015519	0.261469	0.049092	0.023565	0.00737	0.034436	0.076573	1.012695	0.270574	0.033571	0.274671	2.598982	0.111736	1.477722	0.296245	0.033571	0.274671	2.598982	0.044979	1.599932	15.11623	5.97113	0.017438	0.005243	0.000459
San Mateo	2023	MHDT	Aggregate	Aggregate	Diesel	4189.443	175901.2	175901.2	0	50462.49	1.42648	14.09475	1.586053	0.018782	0.040011	0	0.003	0.015983	0.019631	0.041821	0	0.012	0.045665	1155.919	2264.351	0	0.002009	0.012779	0	0.182115	0.356749	0	0.043248	0.275121	0	0	0	0	0.049234	0.313205	0	0	0	0	0	0.206918	0.148734	7.579195	0	0.010946	0.021442	0	0
San Mateo	2023	MHDT	Aggregate	Aggregate	Electricity	2.059294	44.11104	0	44.11104	25.56596	0	0	0	0	0	0	0.003	0.007991	0	0	0	0.012	0.022833	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	MHDT	Aggregate	Aggregate	Natural Ga	38.13508	1832.77	1832.77	0	342.2075	0.132951	6.609544	0	0.001228	0.018659	0	0	0.003	0.016094	0.001336	0.020293	0	0.012	0.045982	1008.408	5458.884	0	0.769477	17.52611	0	0.20557	1.112829	0	0.010994	0.250414	0	0	0	0	0.785307	17.88668	0	0	0	0	0	1.06	3.064735	35.81803	0	0	0	0	0
San Mateo	2023	OBUS	Aggregate	Aggregate	Gasoline	256.5607	15177.04	15177.04	0	5133.267	0.308106	0.065063	0.369453	0.001	0	0.000287	0.003	0.01568	0.001088	0	0.000312	0.012	0.044799	1742.276	373.6354	30.27704	0.009595	0.205564	0.033157	0.017281	0.005903	0.031894	0.045405	0.746279	0.163878	0.026481	0.113352	1.902307	0.066255	1.088969	0.179425	0.026481	0.113352	1.902307	0.044919	0.985887	5.774707	3.460301	0.017224	0.003694	0.000299
San Mateo	2023	OBUS	Aggregate	Aggregate	Diesel	1051.799	74746.95	74746.95	0	10288.18	0.843686	5.779548	1.508936	0.009565	0.003378	0	0.003	0.017376	0.009998	0.003531	0	0.012	0.049647	1250.895	1225.784	0	0.000947	0.013995	0	0.197079	0.119123	0	0.020398	0.301313	0	0	0	0	0.023222	0.343022	0	0	0	0	0	0.217631	0.094166	5.629794	0	0.011845	0.011607	0	0
San Mateo	2023	OBUS	Aggregate	Aggregate	Natural Ga	6.660994	415.1452	415.1452	0	59.28285	0.232948	1.556882	0	0.000856	0.003435	0	0	0.003	0.016148	0.000931	0.003736	0	0.012	0.046137	1029.36	1194.248	0	0.766347	4.477255	0	0.209842	0.243455	0	0.01095	0.063971	0	0	0	0	0.782113	4.569367	0	0	0	0	0	1.06	3.19115	6.306096	0	0	0	0	0
San Mateo	2023	SBUS	Aggregate	Aggregate	Gasoline	62.11288	3411.923	3411.923	0	248.4515	0.897656	0.923288	0.643317	0.001164	0	0.000721	0.002	0.015721	0.001266	0	0.000784	0.008	0.044917	797.3184	2541.99	62.30631	0.021738	2.445799	0.089765	0.041731	0.084017	0.05658	0.106456	10.59413	0.521132	0.139121	0.406864	2.094566	0.15534	15.45893	0.570574	0.139121	0.406864	2.094566	0.045	2.707181	81.95312	13.2835	0.007882	0.02513	0.000616
San Mateo	2023	SBUS	Aggregate	Aggregate	Diesel	168.8118	3793.041	3793.041	0	2444.395	5.00314	23.87172	0.437587	0.023953	0.025817	0	0.003	0.015721	0.025036	0.026985	0	0.012	0.044917	1149.738	2246.853	0	0.003233	0.008312	0	0.181142	0.353993	0	0.069615	0.178964	0	0	0	0	0.079252	0.203737	0	0	0	0	0	0.134019	0.208594	4.289616	0	0.010887	0.021276	0	0
San Mateo	2023	SBUS	Aggregate	Aggregate	Electricity	0.041475	0.481131	0	0.481131	0.600564	0	0	0	0	0	0	0	0.003	0.00786	0	0	0	0.012	0.022459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	SBUS	Aggregate	Aggregate	Natural Ga	6.023036	153.4041	153.4041	0	87.21356	0.556332	5.264261	0	0.003378	0.011516	0	0	0.003	0.015721	0.003674	0.012524	0	0.012	0.044917	1258.036	4080.42	0	3.408583	15.17474	0	0.256459	0.83182	0	0.048702	0.216817	0	0	0	0	3.478709	15.48694	0	0	0	0	0	1.06	11.51682	21.10371	0	0	0	0	0
San Mateo	2023	UBUS	Aggregate	Aggregate	Gasoline	61.26278	4165.676	4165.676	0	245.0511	0.037017	0	0.578233	0.000989	0	0.000127	0.002	0.002073	0.032333	0.001076	0	0.000139	0.00829	0.092379	1025.682	0	41.23868	0.002259	0	0.053565	0.004956	0	0.077039	0.006631	0	0.206281	0.070589	0.114555	0.693653	0.009677	0	0.225852	0.070589	0.114555	0.693653	0.045	0.556154	0	5.887541	0.01014	0	0.000408
San Mateo	2023	UBUS	Aggregate	Aggregate	Diesel	341.8463	28540.62	28540.62	0	1367.385	2.897593	0	0	0.007619	0	0	0.002	0.007913	0.0385	0.007964	0	0	0.031652	0.11	1451.453	0	0	0.007311	0	0	0.228677	0	0	0.157395	0	0	0	0	0.179182	0	0	0	0	0	0	0.122644	0.192989	0	0	0.013753	0	0
San Mateo	2023	UBUS	Aggregate	Aggregate	Electricity	2.018703	15.3193	0	15.3193	8.074811	0	0	0	0	0	0	0	0.009	0.01925	0	0	0	0.036	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Mateo	2023	UBUS	Aggregate	Aggregate	Natural Ga	34.94319	1199.611	1199.611	0	139.7728	0.063405	0	0	0.000296	0	0	0.008789	0.0385	0.000309	0	0	0.035157	0.11	1349.38	0	0	4.445831	0	0	0.27508	0	0	0.063522	0	0	0	0	0	0	4.537297	0	0	0	0	0	0	0.97	52.53671	0	0	0	0	0

Attachment 4: Project Construction Emissions and Health Risk Calculations

Bertoluccis, South San Francisco, CA

DPM Construction Emissions and Modeling Emission Rates - Without Mitigation

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2023	Construction	0.0823	Point	60	164.7	0.05012	6.32E-03	1.05E-04
Total		***0.0823***			***164.7***	***0.0501***	***0.0063***	

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (8am -5pm)
days/yr = 365
hours/year = 3285

Bertoluccis, South San Francisco, CA

PM2.5 Fugitive Dust Construction Emissions for Modeling - Without 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)	DPM Emission Rate $g/s/m^2$
2023	Construction	CON_FUG	0.0177	35.4	0.01077	1.36E-03	2709.7	5.01E-07
Total			***0.0177***	***35.4***	***0.0108***	***0.0014***		

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (8am -5pm)
days/yr = 365
hours/year = 3285

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2023	Construction	0.0050	Point	60	10.0	0.00305	3.85E-04	6.41E-06
Total		***0.0050***			***10.0***	***0.0031***	***0.0004***	

Emissions assumed to be evenly distributed over each construction areas

hr/day =	9	(8am -5pm)
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)	DPM Emission Rate $g/s/m^2$
2023	Construction	CON_FUG	0.0086	17.2	0.00524	6.60E-04	2709.7	2.44E-07
Total			***0.0086***	***17.2***	***0.0052***	***0.0007***		

Emissions assumed to be evenly distributed over each construction areas

hr/day =	9	(8am -5pm)
days/yr =	365	
hours/year =	3285	

Bertoluccis, South San Francisco, CA
Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.3532	0.0935	62.82	1.01	0.07	0.45
Total	-	-	**62.82**	**1.01**		-
Maximum	0.3532	0.0935	**-**	**-**	**0.07**	**0.45**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0215	0.0456	3.83	0.06	0.00	0.07
Total	-	-	**3.83**	**0.06**	-	-
Maximum	0.0215	0.0456	**-**	**-**	**0.00**	**0.07**

- Tier 4 Interim Engine, BMP Mitigation, and electric welders as mitigation

Bertoluccis, South San Francisco, 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				
				DPM Conc (ug/m3)	Age	Infant/Child		Modeled DPM Conc (ug/m3)	Age	Adult
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**
0	0.25	-0.25 - 0*	2023	0.3284	10	4.47	2023	0.3284	-	-
1	1	0 - 1	2023	0.3284	10	53.94	2023	0.3284	1	0.94
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						**58.41**				**0.94**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.066	0.03	0.36

* Third trimester of pregnancy

Bertoluccis, South San Francisco, 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				
				DPM Conc (ug/m3)	Age	Infant/Child		Modeled DPM Conc (ug/m3)	Age	Adult
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**
0	0.25	-0.25 - 0*	2023	0.3532	10	4.80	2023	0.3532	-	-
1	1	0 - 1	2023	0.3532	10	58.02	2023	0.3532	1	1.01
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						**62.82**				**1.01**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.071	0.094	0.45

* Third trimester of pregnancy

Bertoluccis, South San Francisco, 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				
				DPM Conc (ug/m3)	Age	Infant/Child		Modeled DPM Conc (ug/m3)	Age	Adult
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**
0	0.25	-0.25 - 0*	2023	0.1773	10	2.41	2023	0.1773	-	-
1	1	0 - 1	2023	0.1773	10	29.13	2023	0.1773	1	0.51
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						**31.54**				**0.51**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.04	0.159	0.34

* Third trimester of pregnancy

Bertoluccis, South San Francisco, CA - Construction Impacts - With 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				
				DPM Conc (ug/m3)	Age	Infant/Child		Modeled DPM Conc (ug/m3)	Age	Adult
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**
0	0.25	-0.25 - 0*	2023	0.0200	10	0.27	2023	0.0200	-	-
1	1	0 - 1	2023	0.0200	10	3.29	2023	0.0200	1	0.06
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						**3.56**				**0.06**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0040	0.016	0.04

* Third trimester of pregnancy

Bertoluccis, South San Francisco, CA - Construction Impacts - With 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	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult			
Exposure Year	Exposure Duration (years)	Age	Year	Annual	Sensitivity Factor	Cancer Risk (per million)	Year	Annual	Sensitivity Factor	Cancer Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2023	0.0215	10	0.29	2023	0.0215	-	-			
1	1	0 - 1	2023	0.0215	10	3.53	2023	0.0215	1	0.06	0.004	0.05	0.07
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						**3.83**				**0.06**			

* Third trimester of pregnancy

Bertoluccis, South San Francisco, CA - Construction Impacts - With 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	Infant/Child Cancer	Modeled DPM Conc (ug/m3)		Age	Adult Cancer			
Exposure Year	Exposure Duration (years)	Age	Year	Annual	Sensitivity Factor	Risk (per million)	Year	Annual	Sensitivity Factor	Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2023	0.0108	10	0.15	2023	0.0108	-	-			
1	1	0 - 1	2023	0.0108	10	1.77	2023	0.0108	1	0.03	0.002	0.08	0.00
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						**1.92**				**0.03**			

* Third trimester of pregnancy

Attachment 5: Community Risk Modeling Information and Calculations

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	**1/3/2022**
Contact Name	Zachary Palm
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x117
Email	zpalm@illingworthrodkin.com
Project Name	Bertoluccis
Address	209, 213 Lux Ave and 421 Cypress Ave
City	South San Francisco
County	San Mateo
Type (residential, commercial, mixed use, industrial, etc.)	Mixed Use
Project Size (# of units or building square feet)	99du
Comments:	

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

1. Complete all the contact and project information requested in Table A ncomplete 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 lue section 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	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
1000	15132	NOD Auto Body Shop Inc	206 Baden Ave		0.00048207			Auto Body Coating Operation		2018 Dataset	0.13	0.00	0.000	0.00
150	20215	NOD Auto Body Shop Inc	110 Lux Ave		0.00			Auto Body Coating Operation		2018 Dataset	0.70	0.00	0.000	0.00
775	109214	Unocal #1020 --Grand Martco Inc	221 Airport Blvd	24.52	0.11			Gas Dispensing Facility		2018 Dataset	0.02	0.54	0.002	0.00
670	200891	Chico's Service Station	401 LINDEN AVE	13.38	0.06			Gas Dispensing Facility		2018 Dataset	0.03	0.39	0.002	0.00
190	201062	A&K Supreme Auto	510 CYPRESS AVE # 512		0.00482071			Auto Body Coating Operation		2018 Dataset	0.66	0.00	0.003	0.00

Construction MEIs

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
875	15132	0.17	0.00	0.000	0.000
150	20215	0.70	0.00	0.000	0.000
680	109214	0.03	0.69	0.003	0.000
400	200891	0.07	0.88	0.004	0.000
170	201062	0.68	0.00	0.003	0.000

Footnotes:

1. Maximally exposed individual
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
    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-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead should
    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.

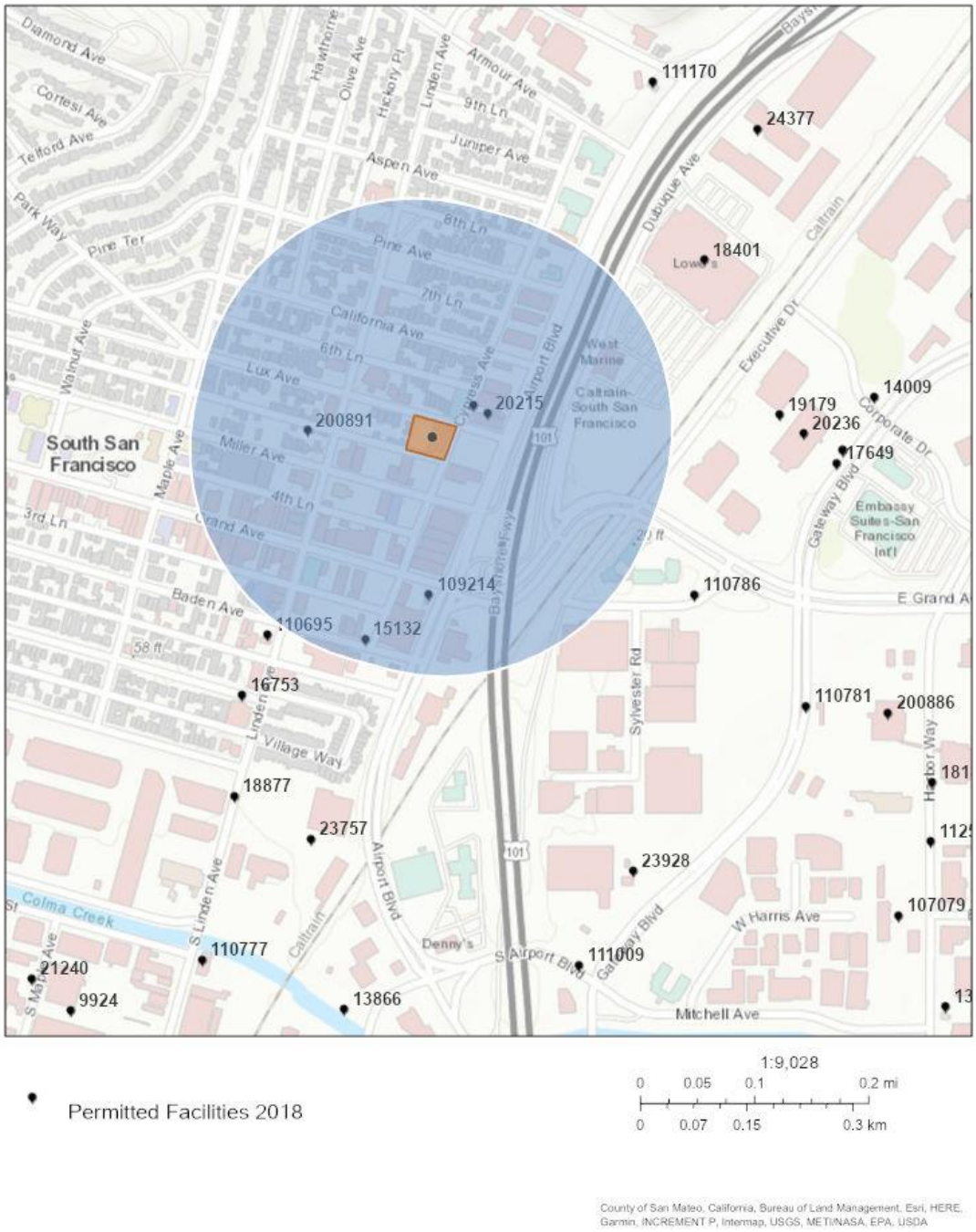
Date last updated:
03/13/2018

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 3,878,091.61 ft²

Jan 3 2022 16:36:57 Pacific Standard 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	15132	NOD Auto Body Shop Inc	206 Baden Ave	South San Francisco	CA
2	20215	NOD Auto Body Shop Inc	110 Lux Ave	South San Francisco	CA
3	109214	Unocal #1020 --Grand Martco Inc	221 Airport Blvd	South San Francisco	CA
4	200891	Chico's Service Station	401 LINDEN AVE	S SAN FRAN	CA
5	201062	A&K Supreme Auto	510 CYPRESS AVE # 512	S SAN FRAN	CA

#	Zip	County	Cancer	Hazard	PM_25	Type	Count
1	94080	San Mateo	0.000	0.000	0.000	Contact BAAQMD	1
2	94080	San Mateo	0.000	0.000	0.000	Contact BAAQMD	1
3	94080	San Mateo	24.520	0.110	0.000	Gas Dispensing Facility	1
4	94080	San Mateo	13.380	0.060	0.000	Gas Dispensing Facility	1
5	94080	Santa Clara	0.000	0.000	0.000	Contact BAAQMD	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.