141 3rd AVENUE TOWNHOME CONSTRUCTION COMMUNITY RISK ASSESSMENT

Daly City, California

January 29, 2021

Prepared for:

Connor Tutino
Researcher
David J. Powers & Associates, Inc.
1736 Franklin Street, Suite 300
Oakland, CA 94612

Prepared by:

Casey Divine,
Zachary Palm, &
James A. Reyff

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

I&R Project#: 20-185

Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of the proposed townhome project located at 141 3rd Avenue in Daly City, 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 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 currently occupied by an approximate 1,200 square foot single-family home. The remainder of the 0.68-acre site is vacant. The project proposes to demolish the existing use and construct 15 townhomes with enclosed garages. Construction is to begin in September of 2021 and is expected to complete in June of 2022.

Setting

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

Air Pollutants of Concern

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

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

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

Toxic Air Contaminants

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

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

Regulatory Setting

Federal Regulations

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

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

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

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

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

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

State Regulations

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

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

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

Bay Area Air Quality Management District (BAAQMD)

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

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

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

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

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[4] 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.

Daly City 2030 General Plan

The following air resources policies and implementing tasks contained in the Resource Management Element of the Daly City 2030 General Plan[5] are applicable to the proposed project:

> *Policy RME-5:* Assess projected air emissions from new development and associated construction and demolition activities in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines, and relative to state and federal standards.
>
> - Task RME-5.1: Amend the Planning Division's development review procedures to include a formal step that would help identify how a development project can incorporate design or functional changes that will minimize air quality impacts.
>
> - Task RME-5.2: Incorporate air quality significance thresholds into the Local Thresholds of Significance document identified in Program RME-1.
>
> - Task RME-5.3: Consider cumulative air quality impacts consistent with the region's Clean Air Plan and State law.
>
> - Task RME-5.4: Require the preparation of a Transportation Systems Management plan for new development that has been determined to contribute to a reduction in location air quality. Daly City 2030 General Plan | Resource Management Element 193

[4] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.
[5] Daly City, 2013. *Daly City 2030 General Plan*. Adopted March 25, 2013.

- Task RME-5.5: Consult with BAAQMD to identify stationary and mobile TAC sources and determine the need for and requirements of a health risk assessment for proposed developments. type, size and operations of the facility.

Policy RME-6: Assess projected air emissions from new development and associated construction and demolition activities in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines, and relative to state and federal standards.

- Task RME-6.1: For new, expanded, or modified development proposals (including tenant improvements) that are potential sources of objectionable smoke and odor, require an analysis of possible smoke and odor impacts and the provision of smoke and odor minimization and control measures as mitigation. The requirements for such shall be codified within the Daly City Municipal Code.

Task RME-6.2: Require new residential development projects and projects categorized as sensitive receptors to be located an adequate distance from facilities that are existing and potential sources of odor. An adequate separate distance will be determined based upon the type, size and operations of the facility.

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 single- and multi-family residences adjacent to and surrounding the project site. There are also students at the nearby Thornton High School (14 years and older) to the west of the site and Milestone Academy Preschool (2 years and older) to the southeast of the 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.

Table 1. Community Risk Significance Thresholds

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

Construction Community Risk Impacts and Mitigation Measures

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

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

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

Construction Period Emissions

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

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

The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2017 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

Land Use Inputs

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

Table 1. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Condo/Townhouse	15	Dwelling Unit	33,675	0.68
Enclosed Parking Structure	30	Parking Spaces	2,245	

Construction Inputs

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

The construction equipment worksheets provided by the applicant included the schedule for each phase. Within each phase, the quantity of equipment to be used along with the average hours per day and total number of workdays was set to the default values in CalEEMod. Where CalEEMod doesn't provide default values, conservatively high values were assumed for equipment required and hours operated. 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 September 2021 and would be built out over a period of approximately ten months, or 206 construction workdays. The earliest year of full operation was assumed to be 2023.

Construction Truck Traffic Emissions

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

grading volumes. The number of concrete and asphalt total round haul trips were provided for the project and converted to total one-way trips, assuming two trips per delivery.

The construction traffic information was combined with EMFAC2017 motor vehicle emissions factors. EMFAC2017 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod default assumptions, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including cement trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (demolition material export and soil import/export). Since CalEEMod does not address cement trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On road emissions in Santa Clara County for 2021 and 2022 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2017 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2017 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	62.6% LDA 8.8% LDT1 28.5% LDT2	77.2% MHDT 22.8% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Cement/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Demolition	110	-	5	1,200 square foot building demolition. CalEEMod default worker trips.
Site Preparation	115	-	-	CalEEMod default worker trips.
Grading	210	-	75	400-cy soil import. 200-cy soil export. CalEEMod default worker trips.
Trenching	132	-	-	CalEEMod default worker trips.
Building Construction	1,296	216	230	115 cement round trips. CalEEMod default worker and vendor trips.
Architectural Coating	134	-	-	CalEEMod default worker trips.
Paving	54	-	300	150 tons asphalt. CalEEMod default worker trips.

Notes: [1] Based on 2021-2022 EMFAC2017 light-duty vehicle fleet mix for San Mateo County.
[2] Includes grading trips estimated by CalEEMod based on amount of material to be removed.

Summary of Computed Construction Period Emissions

The CalEEMod model and EMFAC2017 emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-

road vehicles, with total emissions from all construction stages as 0.0386 tons (77 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.0046 tons (9 pounds) for the overall construction period.

Community Health Risk from Project Construction

Dispersion Modeling

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

Construction Sources

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

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

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

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

AERMOD Inputs and Meteorological Data

The modeling used a three-year data set (2010, 2012, 2013) of hourly meteorological data from the Fort Funston prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring daily between 7:00 a.m. to 6:00 p.m., when the majority of construction activity would occur according to the applicant. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2021-2022 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) were used to represent the breathing height on the first floor of nearby single- and multi-family residences.[10] Receptor heights of 3 feet (1 meter) were used to represent the breathing height of the children at the high school and preschool.

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. For the students, children at Milestone Academy Preschool and Thornton High School were assumed to be two years and older. The child (ages 2 through 16 years old) cancer risk parameters were used to calculate the increased cancer risk for the students.

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 at single-family home east of the construction project site. Table 4 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

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

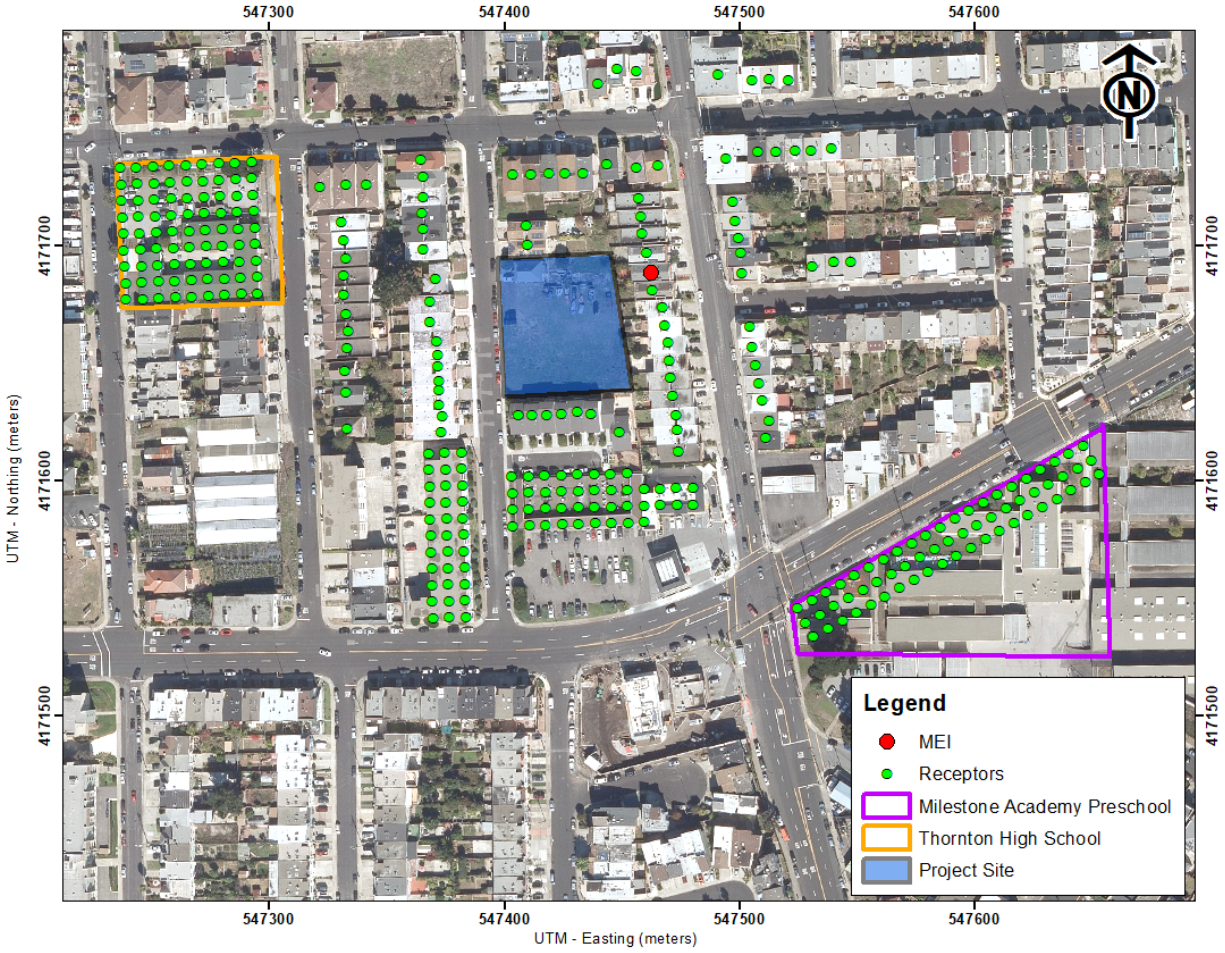
[10] Bay Area Air Quality Management District, 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0. May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

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

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	**30.5 (infant)**	0.23	0.03
	Mitigated*	1.7 (infant)	0.04	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*
Most Affected Nearby School – Milestone Academy Preschool Child Receptors				
Project Construction	Unmitigated	0.9 (child)	0.02	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

* Construction equipment with Tier 4 interim engines and Best Management Practices as Mitigation Measures.

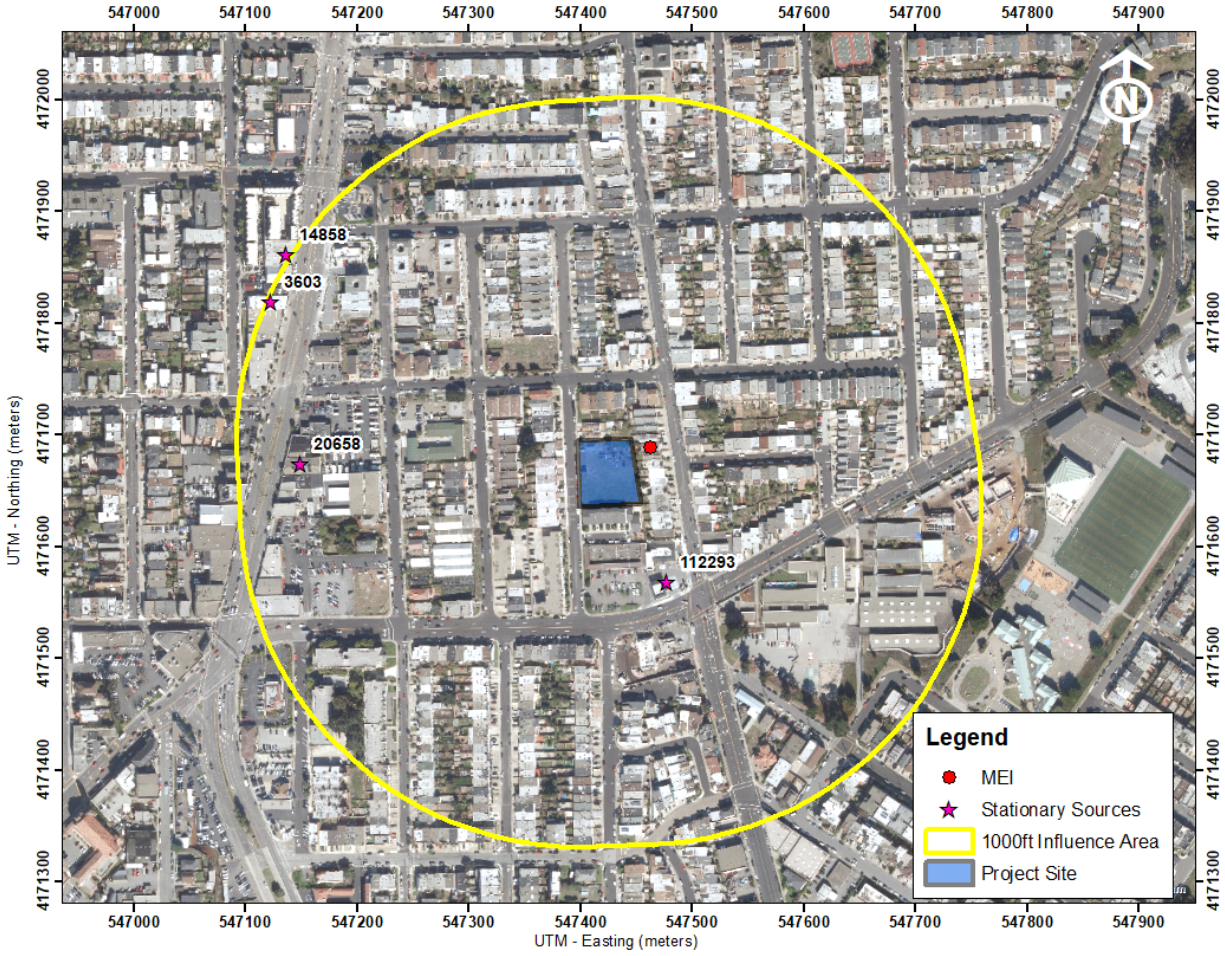
Figure 1. Project Construction Site, Locations of Off-Site Sensitive Receptors, and Maximum TAC Impact Location



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

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

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



Highways – Mission Street (State Route 82)

BAAQMD provided raster files with cancer risk and $PM_{2.5}$ values for all highways/freeways, roadways (ADT > 30,000), and rail lines within the Bay Area. The risk values shown in the raster files were modeled in AERMOD in 20x20-meter grid cells. The files incorporate AADT for the

highway using EMFAC 2014 data for fleet mix and include the OEHHA 2015 factor. These raster files were used to screen the Mission Street (S.R.82) risks and hazards upon the MEI. The MEI is approximately 1,025 feet east of the state route. At the edge of the MEI, the increased cancer risk would be 5.1 per million and the $PM_{2.5}$ value would be 0.17 $\mu g/m^3$. Note that the cancer risk value is not adjusted for age sensitivity or exposure duration. It is conservatively higher than adjusted cancer risk values. Refined modeling of the state route would have resulted in even lower risk values. Note that BAAQMD has found that non-cancer hazards were found to be minimal, so an HI value is not included. The rail line screening levels are listed in Table 5.

BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website.[11] This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. Four sources were identified using this tool with three sources being auto body coating equipment and one a gas dispensing facility. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided input and clarification about the stationary sources.[12]

The screening level risks and hazards for the three generic sources reported by BAAQMD were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Generic Equipment*. The gas station source #112293 had high screening risk levels that were close to the project site. Therefore, emissions data provided by BAAQMD were input into BAAQMD's *Risk and Hazards Emissions Screening Calculator,* which is a more refined screening tool that computes the cancer risk, annual $PM_{2.5}$ concentrations, and HI using adjustments to account for new OEHHA guidance and distance between the receptor and source. Community risk impacts from the stationary sources upon the MEI is reported in Table 5.

Summary of Cumulative Health Risk Impact at Construction MEI

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

[11] BAAQMD, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65
[12] Email correspondence with Areana Flores, MSc, Environmental Planner, BAAQMD, January 19, 2021.

Table 5. Impacts from Combined Sources at Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Project Construction	Unmitigated	**30.5 (infant)**	0.23	0.03
	Mitigated	1.7 (infant)	0.04	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated	*No*	*No*	*No*
Cumulative Sources				
Mission Street (S.R. 82) – Raster Screening Data		5.1	0.17	--
Colma Auto Body Shop Inc (Facility ID #3603, Auto Body Coating), MEI +1,000 feet		--	--	<0.01
D&J Auto Body Specialists Inc. (Facility ID #14858, Auto Body Coating), MEI +1,000 feet		--	--	<0.01
19th Auto Body Center (Facility ID #20658, Auto Body Coating), MEI 970 feet		--	--	<0.01
Hillside Shell (Facility ID #112293, Gas Station), MEI 400 feet		4.0	--	0.02
Combined Sources	Unmitigated	39.6 (infant)	0.40	<0.08
	Mitigated	10.8 (infant)	0.21	<0.06
BAAQMD Cumulative Source Threshold		***>100***	***>0.8***	***>10.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*

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

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

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

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

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

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

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

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

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

Effectiveness of Recommended Measure AQ-1

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

Mitigation Measure AQ-2: **Use construction equipment that has low diesel particulate matter exhaust to minimize emissions**

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

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

    a. 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 67 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

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

Effectiveness of Mitigation Measure AQ-2

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 interim engines standards and BAAQMD best management practices for construction were included. With these implemented, the project's construction cancer risk impact, assuming infant exposure, would be reduced to 1.68 per million. As a result, the project's construction cancer risk would be reduced below the BAAQMD single-source threshold.

On-Site Community Health Risk Impacts – New Project Residents

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

Highways – Mission Street (S.R. 82)

The state route screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. The project site is approximately 850 east of the state route. The community risk impacts from the state route at the project site are shown in Table 6.

Stationary Sources

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

Combined Community Health Risk at Project Site

Community risk impacts from the existing TAC sources upon the project site are reported in Table 6. The risks from the singular TAC sources are compared against the BAAQMD single-source threshold. The risks from all the sources are then combined and compared against the BAAQMD cumulative-source threshold. As shown, 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.

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

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Mission Street (S.R. 82) – Raster Screening Data	5.4	0.18	--
Colma Auto Body Shop Inc (Facility ID #3603, Auto Body Coating), Project Site 950 feet	--	--	<0.01
D&J Auto Body Specialists Inc. (Facility ID #14858, Auto Body Coating), Project Site 990 feet	--	--	<0.01
19th Auto Body Center (Facility ID #20658, Auto Body Coating), Project Site 750 feet	--	--	<0.01
Hillside Shell (Facility ID #112293, Gas Station), Project Site 210 feet	0.6	--	<0.01
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	*No*	*No*	*No*
Cumulative Total	6.0	0.18	<0.04
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 EMFAC2017 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

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

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

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[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 N 141 3rd Ave

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size 15 Dwelling Units 0.68 total project acres disturbed

33,675 s.f. residential

N/A s.f. retail

N/A s.f. office/commercial

s.f. other, specify:

2245 s.f. parking garage 30 spaces

N/A s.f. parking lot spaces

Construction Hours 7:00 am to 6:00 pm

N

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

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower:

Fuel Type:

Location in project (Plans Desired if Available):

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

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
	Demolition	**Start Date:**	**9/1/2021**	**Total phase:**	**14**			**Overall Import/Export Volumes**
		End Date:	**9/15/2021**					
1	Concrete/Industrial Saws	81	0.73	8	14	8	112	**Demolition Volume**
	Excavators	158	0.38			0	0	Square footage of buildings to be demolished
1	Rubber-Tired Dozers	247	0.4	1	14	1	14	(*or* total tons to be hauled)
2	Tractors/Loaders/Backhoes	97	0.37	6	14	6	168	__?__ square feet *or* Lot has no existing building
								__?__ Hauling volume (tons) NA
								no
	Site Preparation	**Start Date:**	**9/15/2021**	**Total phase:**	**30**			
		End Date:	**10/15/2021**					
1	Graders	187	0.41	8	30	8	240	
	Rubber Tired Dozers	247	0.4			0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8	30	8	240	
	Grading / Excavation	**Start Date:**	**10/16/2021**	**Total phase:**	**30**			
		End Date:	**11/15/2021**					**Soil Hauling Volume**
	Excavators	158	0.38			0	0	Export volume = __?__ cubic yards? 200 cubic yards
	Graders	187	0.41			0	0	Import volume = __?__ cubic yards? 400 yards from correspondence word doc
1	Rubber Tired Dozers	247	0.4	1	30	1	30	
1	Concrete/Industrial Saws	81	0.73	8	30	8	240	
2	Tractors/Loaders/Backhoes	97	0.37	6	30	6	360	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**11/16/2021**	**Total phase:**	**60**			
		End Date:	**1/15/2022**					
1	Tractor/Loader/Backhoe	97	0.37	8	60	8	480	
1	Excavators	158	0.38	8	60	8	480	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**12/15/2021**	**Total phase:**	**151**			**Cement Trucks? __?__ Total Round-Trips 115 loads**
		End Date:	**5/15/2022**					
1	Cranes	231	0.29	4	151	4	604	Electric? (Y/N) __N__ Otherwise assumed diesel yes- electric
2	Forklifts	89	0.2	6	151	6	1812	Liquid Propane (LPG)? (Y/N) no
	Generator Sets	84	0.74			0	0	Or temporary line power? (Y/N) yes
2	Tractors/Loaders/Backhoes	97	0.37	8	151	8	2416	
	Welders	46	0.45			0	0	
	Other Equipment?					0		
	Building - Interior/Architectural Coating	**Start Date:**	**3/15/2022**	**Total phase:**	**92**			
		End Date:	**6/15/2022**					
1	Air Compressors	78	0.48	6	92	6	552	
	Aerial Lift	62	0.31			0	0	
	Other Equipment?							
	Paving	**Start Date:**	**12/8/2021**	**Total phase:**	**2**			
		Start Date:	**12/10/2021**					
4	Cement and Mortar Mixers	9	0.56	6	2	6	48	
1	Pavers	130	0.42	7	2	7	14	**Asphalt? __150tons__ cubic yards or __8__ round trips?**
	Paving Equipment	132	0.36			0	0	
1	Rollers	80	0.38	7	2	7	14	
1	Tractors/Loaders/Backhoes	97	0.37	7	2	7	14	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						

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 horepower or load factor, as appropriate

Complete one sheet for each project component

141 3rd Ave Townhome Construction

San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	15.00	Dwelling Unit	0.68	33,675.00	43
Enclosed Parking Structure	30.00	Space	0.00	2,245.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	210	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E Intensity Rate = 210 (Year 2017)

Land Use - Square footage provided by client

Construction Phase - Construction schedule provided by client. Default equipment and hours.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Construction equipment and hours default. Assumed 1 excavator and 1 tractor, 8 hrs/day for trenching.

Grading - Construction worksheet and correspondence data. Grading = 400 cubic yards imported, 200 cubic yards exported.

Demolition - Existing building demo. Google Earth est. 1200 sqft

Trips and VMT - Trips copied to EMFAC

Architectural Coating - Square footage provided in site plan

Construction Off-road Equipment Mitigation - All equipment greater than 50hp T4i. Water and vehicle speed at default.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Interior	68,192.00	33,675.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
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	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

tblConstructionPhase	NumDays	5.00	67.00
tblConstructionPhase	NumDays	100.00	108.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	2.00	21.00
tblConstructionPhase	NumDays	5.00	3.00
tblConstructionPhase	NumDays	1.00	23.00
tblConstructionPhase	PhaseEndDate	2/18/2022	6/15/2022
tblConstructionPhase	PhaseEndDate	2/4/2022	5/15/2022
tblConstructionPhase	PhaseEndDate	9/14/2021	9/15/2021
tblConstructionPhase	PhaseEndDate	9/17/2021	11/15/2021
tblConstructionPhase	PhaseEndDate	2/11/2022	12/10/2021
tblConstructionPhase	PhaseEndDate	9/15/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	2/12/2022	3/15/2022
tblConstructionPhase	PhaseStartDate	9/18/2021	12/15/2021
tblConstructionPhase	PhaseStartDate	9/16/2021	10/16/2021
tblConstructionPhase	PhaseStartDate	2/5/2022	12/8/2021
tblGrading	MaterialExported	0.00	200.00
tblGrading	MaterialImported	0.00	400.00
tblLandUse	BuildingSpaceSquareFeet	15,000.00	33,675.00
tblLandUse	BuildingSpaceSquareFeet	12,000.00	2,245.00
tblLandUse	LandUseSquareFeet	15,000.00	33,675.00
tblLandUse	LandUseSquareFeet	12,000.00	2,245.00
tblLandUse	LotAcreage	0.94	0.68
tblLandUse	LotAcreage	0.27	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblProjectCharacteristics	CO2IntensityFactor	641.35	210
tblProjectCharacteristics	OperationalYear	2018	2023
tblTripsAndVMT	HaulingTripNumber	5.00	0.00

tblTripsAndVMT	HaulingTripNumber	75.00	0.00
tblTripsAndVMT	VendorTripNumber	2.00	0.00
tblTripsAndVMT	WorkerTripNumber	2.00	0.00
tblTripsAndVMT	WorkerTripNumber	12.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0333	0.3369	0.3194	5.4000e-004	0.0146	0.0171	0.0317	5.1000e-003	0.0159	0.0210	0.0000	46.7771	46.7771	0.0128	0.0000	47.0971
2022	0.1988	0.3982	0.4280	6.8000e-004	0.0000	0.0213	0.0213	0.0000	0.0198	0.0198	0.0000	59.7638	59.7638	0.0171	0.0000	60.1918
Maximum	**0.1988**	**0.3982**	**0.4280**	**6.8000e-004**	**0.0146**	**0.0213**	**0.0317**	**5.1000e-003**	**0.0198**	**0.0210**	**0.0000**	**59.7638**	**59.7638**	**0.0171**	**0.0000**	**60.1918**

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					

2021	9.8900e-003	0.2053	0.3631	5.4000e-004	6.5800e-003	8.4000e-004	7.4200e-003	2.2900e-003	8.4000e-004	3.1300e-003	0.0000	46.7770	46.7770	0.0128	0.0000	47.0971
2022	0.1713	0.2664	0.4710	6.8000e-004	0.0000	1.0900e-003	1.0900e-003	0.0000	1.0900e-003	1.0900e-003	0.0000	59.7637	59.7637	0.0171	0.0000	60.1917
Maximum	**0.1713**	**0.2664**	**0.4710**	**6.8000e-004**	**6.5800e-003**	**1.0900e-003**	**7.4200e-003**	**2.2900e-003**	**1.0900e-003**	**3.1300e-003**	**0.0000**	**59.7637**	**59.7637**	**0.0171**	**0.0000**	**60.1917**

	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	**21.93**	**35.82**	**-11.58**	**0.00**	**55.02**	**94.97**	**83.94**	**55.10**	**94.60**	**89.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	9-1-2021	11-30-2021	0.2499	0.1350
2	12-1-2021	2-28-2022	0.2923	0.1931
3	3-1-2022	5-31-2022	0.3853	0.2901
4	6-1-2022	8-31-2022	0.0338	0.0312
		Highest	0.3853	0.2901

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	0.1934	2.0800e-003	0.1593	1.0000e-004		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.6839	0.4634	1.1472	1.2800e-003	4.0000e-005	1.1925
Energy	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	31.4974	31.4974	1.6800e-003	6.7000e-004	31.7390
Mobile	0.0187	0.0525	0.2108	7.5000e-004	0.0726	6.0000e-004	0.0732	0.0195	5.6000e-004	0.0201	0.0000	68.5894	68.5894	2.4500e-003	0.0000	68.6508
Waste						0.0000	0.0000		0.0000	0.0000	1.4006	0.0000	1.4006	0.0828	0.0000	3.4700
Water						0.0000	0.0000		0.0000	0.0000	0.3101	0.7091	1.0192	0.0319	7.7000e-004	2.0479
Total	**0.2144**	**0.0740**	**0.3784**	**9.7000e-004**	**0.0726**	**9.6000e-003**	**0.0822**	**0.0195**	**9.5600e-003**	**0.0291**	**2.3946**	**101.2593**	**103.6539**	**0.1201**	**1.4800e-003**	**107.1002**

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	0.1934	2.0800e-003	0.1593	1.0000e-004		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.6839	0.4634	1.1472	1.2800e-003	4.0000e-005	1.1925
Energy	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	31.4974	31.4974	1.6800e-003	6.7000e-004	31.7390
Mobile	0.0187	0.0525	0.2108	7.5000e-004	0.0726	6.0000e-004	0.0732	0.0195	5.6000e-004	0.0201	0.0000	68.5894	68.5894	2.4500e-003	0.0000	68.6508
Waste						0.0000	0.0000		0.0000	0.0000	1.4006	0.0000	1.4006	0.0828	0.0000	3.4700
Water						0.0000	0.0000		0.0000	0.0000	0.3101	0.7091	1.0192	0.0319	7.7000e-004	2.0479
Total	**0.2144**	**0.0740**	**0.3784**	**9.7000e-004**	**0.0726**	**9.6000e-003**	**0.0822**	**0.0195**	**9.5600e-003**	**0.0291**	**2.3946**	**101.2593**	**103.6539**	**0.1201**	**1.4800e-003**	**107.1002**

	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	9/1/2021	9/15/2021	5	11	
2	Site Preparation	Site Preparation	9/15/2021	10/15/2021	5	23	
3	Grading	Grading	10/16/2021	11/15/2021	5	21	
4	Building Construction	Building Construction	12/15/2021	5/15/2022	5	108	
5	Paving	Paving	12/8/2021	12/10/2021	5	3	
6	Architectural Coating	Architectural Coating	3/15/2022	6/15/2022	5	67	
7	Trenching	Trenching	11/16/2021	1/14/2022	5	44	

Acres of Grading (Site Preparation Phase): 11.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 33,675; Residential Outdoor: 22,731; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38

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
Architectural Coating	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Demolition	4	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
Paving	7	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.9000e-004	0.0000	5.9000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3800e-003	0.0399	0.0416	7.0000e-005		2.2400e-003	2.2400e-003		2.1400e-003	2.1400e-003	0.0000	5.7251	5.7251	1.0700e-003	0.0000	5.7518
Total	**4.3800e-003**	**0.0399**	**0.0416**	**7.0000e-005**	**5.9000e-004**	**2.2400e-003**	**2.8300e-003**	**9.0000e-005**	**2.1400e-003**	**2.2300e-003**	**0.0000**	**5.7251**	**5.7251**	**1.0700e-003**	**0.0000**	**5.7518**

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					2.7000e-004	0.0000	2.7000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3000e-003	0.0250	0.0437	7.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	5.7251	5.7251	1.0700e-003	0.0000	5.7518
Total	**1.3000e-003**	**0.0250**	**0.0437**	**7.0000e-005**	**2.7000e-004**	**1.0000e-004**	**3.7000e-004**	**4.0000e-005**	**1.0000e-004**	**1.4000e-004**	**0.0000**	**5.7251**	**5.7251**	**1.0700e-003**	**0.0000**	**5.7518**

Mitigated Construction Off-Site

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

3.3 Site Preparation - 2021

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					6.1000e-003	0.0000	6.1000e-003	6.6000e-004	0.0000	6.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3600e-003	0.0899	0.0463	1.1000e-004		3.4400e-003	3.4400e-003		3.1700e-003	3.1700e-003	0.0000	9.8336	9.8336	3.1800e-003	0.0000	9.9131
Total	**7.3600e-003**	**0.0899**	**0.0463**	**1.1000e-004**	**6.1000e-003**	**3.4400e-003**	**9.5400e-003**	**6.6000e-004**	**3.1700e-003**	**3.8300e-003**	**0.0000**	**9.8336**	**9.8336**	**3.1800e-003**	**0.0000**	**9.9131**

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					2.7400e-003	0.0000	2.7400e-003	3.0000e-004	0.0000	3.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0400e-003	0.0356	0.0674	1.1000e-004		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	9.8336	9.8336	3.1800e-003	0.0000	9.9131
Total	**2.0400e-003**	**0.0356**	**0.0674**	**1.1000e-004**	**2.7400e-003**	**1.8000e-004**	**2.9200e-003**	**3.0000e-004**	**1.8000e-004**	**4.8000e-004**	**0.0000**	**9.8336**	**9.8336**	**3.1800e-003**	**0.0000**	**9.9131**

Mitigated Construction Off-Site

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

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9400e-003	0.0000	7.9400e-003	4.3500e-003	0.0000	4.3500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.3600e-003	0.0762	0.0795	1.3000e-004		4.2800e-003	4.2800e-003		4.0800e-003	4.0800e-003	0.0000	10.9298	10.9298	2.0400e-003	0.0000	10.9807
Total	**8.3600e-003**	**0.0762**	**0.0795**	**1.3000e-004**	**7.9400e-003**	**4.2800e-003**	**0.0122**	**4.3500e-003**	**4.0800e-003**	**8.4300e-003**	**0.0000**	**10.9298**	**10.9298**	**2.0400e-003**	**0.0000**	**10.9807**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.5700e-003	0.0000	3.5700e-003	1.9600e-003	0.0000	1.9600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4800e-003	0.0477	0.0834	1.3000e-004		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	10.9298	10.9298	2.0400e-003	0.0000	10.9807
Total	**2.4800e-003**	**0.0477**	**0.0834**	**1.3000e-004**	**3.5700e-003**	**1.9000e-004**	**3.7600e-003**	**1.9600e-003**	**1.9000e-004**	**2.1500e-003**	**0.0000**	**10.9298**	**10.9298**	**2.0400e-003**	**0.0000**	**10.9807**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0400e-003	0.0519	0.0472	7.0000e-005		2.9100e-003	2.9100e-003		2.6800e-003	2.6800e-003	0.0000	6.5053	6.5053	2.1000e-003	0.0000	6.5579
Total	**5.0400e-003**	**0.0519**	**0.0472**	**7.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.6800e-003**	**2.6800e-003**	**0.0000**	**6.5053**	**6.5053**	**2.1000e-003**	**0.0000**	**6.5579**

Unmitigated Construction Off-Site

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

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5500e-003	0.0291	0.0518	7.0000e-005		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	6.5053	6.5053	2.1000e-003	0.0000	6.5579
Total	**1.5500e-003**	**0.0291**	**0.0518**	**7.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**6.5053**	**6.5053**	**2.1000e-003**	**0.0000**	**6.5579**

Mitigated Construction Off-Site

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

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0326	0.3337	0.3398	5.4000e-004		0.0177	0.0177		0.0163	0.0163	0.0000	47.5702	47.5702	0.0154	0.0000	47.9548
Total	**0.0326**	**0.3337**	**0.3398**	**5.4000e-004**		**0.0177**	**0.0177**		**0.0163**	**0.0163**	**0.0000**	**47.5702**	**47.5702**	**0.0154**	**0.0000**	**47.9548**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0113	0.2128	0.3782	5.4000e-004		8.8000e-004	8.8000e-004		8.8000e-004	8.8000e-004	0.0000	47.5701	47.5701	0.0154	0.0000	47.9547
Total	**0.0113**	**0.2128**	**0.3782**	**5.4000e-004**		**8.8000e-004**	**8.8000e-004**		**8.8000e-004**	**8.8000e-004**	**0.0000**	**47.5701**	**47.5701**	**0.0154**	**0.0000**	**47.9547**

Mitigated Construction Off-Site

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

3.6 Paving - 2021

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	1.0800e-003	0.0101	0.0106	2.0000e-005		5.3000e-004	5.3000e-004		4.9000e-004	4.9000e-004	0.0000	1.4089	1.4089	4.1000e-004	0.0000	1.4191
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0800e-003**	**0.0101**	**0.0106**	**2.0000e-005**		**5.3000e-004**	**5.3000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**1.4089**	**1.4089**	**4.1000e-004**	**0.0000**	**1.4191**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4000e-004	6.0000e-003	0.0104	2.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.4089	1.4089	4.1000e-004	0.0000	1.4191
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.4000e-004**	**6.0000e-003**	**0.0104**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.4089**	**1.4089**	**4.1000e-004**	**0.0000**	**1.4191**

Mitigated Construction Off-Site

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

Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1575					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8500e-003	0.0472	0.0608	1.0000e-004		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003	0.0000	8.5534	8.5534	5.6000e-004	0.0000	8.5673
Total	**0.1644**	**0.0472**	**0.0608**	**1.0000e-004**		**2.7400e-003**	**2.7400e-003**		**2.7400e-003**	**2.7400e-003**	**0.0000**	**8.5534**	**8.5534**	**5.6000e-004**	**0.0000**	**8.5673**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1575					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8200e-003	0.0355	0.0614	1.0000e-004		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	8.5534	8.5534	5.6000e-004	0.0000	8.5673
Total	**0.1594**	**0.0355**	**0.0614**	**1.0000e-004**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**8.5534**	**8.5534**	**5.6000e-004**	**0.0000**	**8.5673**

Mitigated Construction Off-Site

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

3.8 Trenching - 2021

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	7.0900e-003	0.0689	0.0942	1.4000e-004		3.6800e-003	3.6800e-003		3.3800e-003	3.3800e-003	0.0000	12.3743	12.3743	4.0000e-003	0.0000	12.4744

Total	**7.0900e-003**	**0.0689**	**0.0942**	**1.4000e-004**		**3.6800e-003**	**3.6800e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**12.3743**	**12.3743**	**4.0000e-003**	**0.0000**	**12.4744**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0618	0.1066	1.4000e-004		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	12.3743	12.3743	4.0000e-003	0.0000	12.4744
Total	**2.2600e-003**	**0.0618**	**0.1066**	**1.4000e-004**		**2.3000e-004**	**2.3000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**12.3743**	**12.3743**	**4.0000e-003**	**0.0000**	**12.4744**

Mitigated Construction Off-Site

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

3.8 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8400e-003	0.0173	0.0275	4.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	3.6402	3.6402	1.1800e-003	0.0000	3.6697
Total	**1.8400e-003**	**0.0173**	**0.0275**	**4.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**3.6402**	**3.6402**	**1.1800e-003**	**0.0000**	**3.6697**

Unmitigated Construction Off-Site

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

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7000e-004	0.0182	0.0314	4.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	3.6402	3.6402	1.1800e-003	0.0000	3.6697
Total	**6.7000e-004**	**0.0182**	**0.0314**	**4.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**3.6402**	**3.6402**	**1.1800e-003**	**0.0000**	**3.6697**

Mitigated Construction Off-Site

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0187	0.0525	0.2108	7.5000e-004	0.0726	6.0000e-004	0.0732	0.0195	5.6000e-004	0.0201	0.0000	68.5894	68.5894	2.4500e-003	0.0000	68.6508
Unmitigated	0.0187	0.0525	0.2108	7.5000e-004	0.0726	6.0000e-004	0.0732	0.0195	5.6000e-004	0.0201	0.0000	68.5894	68.5894	2.4500e-003	0.0000	68.6508

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	87.15	85.05	72.60	195,789	195,789
Enclosed Parking Structure	0.00	0.00	0.00		
Total	87.15	85.05	72.60	195,789	195,789

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-[illegible]	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking Structure	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.470625	0.050338	0.265549	0.140745	0.017339	0.006996	0.024054	0.006595	0.004215	0.003104	0.009159	0.000488	0.000793
Enclosed Parking Structure	0.470625	0.050338	0.265549	0.140745	0.017339	0.006996	0.024054	0.006595	0.004215	0.003104	0.009159	0.000488	0.000793

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	9.0339	9.0339	1.2500e-003	2.6000e-004	9.1420
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	9.0339	9.0339	1.2500e-003	2.6000e-004	9.1420
NaturalGas Mitigated	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	22.4635	22.4635	4.3000e-004	4.1000e-004	22.5970
NaturalGas Unmitigated	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	22.4635	22.4635	4.3000e-004	4.1000e-004	22.5970

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					
Condo/Townhouse	420950	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	22.4635	22.4635	4.3000e-004	4.1000e-004	22.5970
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.2700e-003**	**0.0194**	**8.2500e-003**	**1.2000e-004**		**1.5700e-003**	**1.5700e-003**		**1.5700e-003**	**1.5700e-003**	**0.0000**	**22.4635**	**22.4635**	**4.3000e-004**	**4.1000e-004**	**22.5970**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	420950	2.2700e-003	0.0194	8.2500e-003	1.2000e-004		1.5700e-003	1.5700e-003		1.5700e-003	1.5700e-003	0.0000	22.4635	22.4635	4.3000e-004	4.1000e-004	22.5970
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.2700e-003**	**0.0194**	**8.2500e-003**	**1.2000e-004**		**1.5700e-003**	**1.5700e-003**		**1.5700e-003**	**1.5700e-003**	**0.0000**	**22.4635**	**22.4635**	**4.3000e-004**	**4.1000e-004**	**22.5970**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	80134.7	7.6332	1.0500e-003	2.2000e-004	7.7245
Enclosed Parking Structure	14704.8	1.4007	1.9000e-004	4.0000e-005	1.4175
Total		**9.0339**	**1.2400e-003**	**2.6000e-004**	**9.1420**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	80134.7	7.6332	1.0500e-003	2.2000e-004	7.7245

Enclosed Parking Structure	14704.8	1.4007	1.9000e-004	4.0000e-005	1.4175
Total		**9.0339**	**1.2400e-003**	**2.6000e-004**	**9.1420**

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	0.1934	2.0800e-003	0.1593	1.0000e-004		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.6839	0.4634	1.1472	1.2800e-003	4.0000e-005	1.1925
Unmitigated	0.1934	2.0800e-003	0.1593	1.0000e-004		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.6839	0.4634	1.1472	1.2800e-003	4.0000e-005	1.1925

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	0.0238					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1317					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0346	8.0000e-004	0.0477	9.0000e-005		6.8100e-003	6.8100e-003		6.8100e-003	6.8100e-003	0.6839	0.2809	0.9647	1.1000e-003	4.0000e-005	1.0056
Landscaping	3.3800e-003	1.2900e-003	0.1117	1.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	0.1825	0.1825	1.8000e-004	0.0000	0.1869

Total	**0.1934**	**2.0900e-003**	**0.1593**	**1.0000e-004**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.6839**	**0.4634**	**1.1472**	**1.2800e-003**	**4.0000e-005**	**1.1925**

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	0.0238					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1317					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0346	8.0000e-004	0.0477	9.0000e-005		6.8100e-003	6.8100e-003		6.8100e-003	6.8100e-003	0.6839	0.2809	0.9647	1.1000e-003	4.0000e-005	1.0056
Landscaping	3.3800e-003	1.2900e-003	0.1117	1.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	0.1825	0.1825	1.8000e-004	0.0000	0.1869
Total	**0.1934**	**2.0900e-003**	**0.1593**	**1.0000e-004**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.6839**	**0.4634**	**1.1472**	**1.2800e-003**	**4.0000e-005**	**1.1925**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.0192	0.0319	7.7000e-004	2.0479
Unmitigated	1.0192	0.0319	7.7000e-004	2.0479

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	0.97731 / 0.61613	1.0192	0.0319	7.7000e-004	2.0479
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.0192**	**0.0319**	**7.7000e-004**	**2.0479**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	0.97731 / 0.61613	1.0192	0.0319	7.7000e-004	2.0479
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.0192**	**0.0319**	**7.7000e-004**	**2.0479**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.4006	0.0828	0.0000	3.4700
Unmitigated	1.4006	0.0828	0.0000	3.4700

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	6.9	1.4006	0.0828	0.0000	3.4700
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**1.4006**	**0.0828**	**0.0000**	**3.4700**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	6.9	1.4006	0.0828	0.0000	3.4700
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**1.4006**	**0.0828**	**0.0000**	**3.4700**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: EMFAC2017 Calculations

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	10	0	110	0	5	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1188	0	100
Site Preparation	5	0	115	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1242	0	0
Grading	10	0	210	0	75	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	2268	0	1500
Trenching	3	0	132	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1425.6	0	0
Building Construction	12	2	1296	216	0	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	13996.8	1576.8	0
Architectural Coating	2	0	134	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1447.2	0	0
Paving	18	0	54	0	0	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	583.2	0	0

Number of Days Per Year					
2021	9/1/21	12/31/21	122	**88**	
2022	1/1/22	6/15/22	166	**118**	
2023			1	**0**	
			289	**206**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	9/1/2021	9/15/2021	5	11
Site Preparation	9/15/2021	10/15/2021	5	23
Grading	10/16/2021	11/15/2021	5	21
Trenching	11/16/2021	1/14/2022	5	44
Building Construction	12/15/2021	5/15/2022	5	108
Architectural Coating	3/15/2022	6/15/2022	5	67
Paving	12/8/2021	12/10/2021	5	3

Summary of Construction Traffic Emissions (EMFAC2017)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2
					Tons						*Metric Tons*
Criteria Pollutants											
2021	0.0011	0.0069	0.0110	0.0001	0.0035	0.0007	0.0043	0.0005	0.0003	0.0009	4.7507
2022	0.0012	0.0080	0.0139	0.0001	0.0048	0.0009	0.0057	0.0007	0.0004	0.0011	6.2948
Toxic Air Contaminants (1 Mile Trip Length)											
2021	0.0008	0.0013	0.0035	0.0000	0.0003	0.0001	0.0004	0.0000	0.0000	0.0001	0.5275
2022	0.0010	0.0017	0.0046	0.0000	0.0004	0.0001	0.0005	0.0001	0.0000	0.0001	0.7006

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: San Mateo
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STI	PM2.5_PM	PM2.5_PM	PM10_RUI	PM10_IDL	PM10_STR	PM10_PM	PM10_PM	CO2_RUNI	CO2_IDLE	CO2_STRE	CH4_RUNE	CH4_IDLE	CH4_STRE	N2O_RUNI	N2O_IDLE	N2O_STRE	ROG_RUN	ROG_IDLE	ROG_STRE	ROG_HOT	ROG_RUN	ROG_REST	ROG_DIUR	TOG_RUNI	TOG_IDLE	TOG_STRE	TOG_HOTS	TOG_RUNI	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
San Mateo	2021	HHDT	Aggregate	Aggregate	Gasoline	2.532598	446.2471	50.67223	2.831271	0	0.014402	0.000799	0	0.00028	0.005	0.02646	0.000869	0	0.000305	0.02	0.06174	2041.498	0	48.50991	0.069466	0	0.000634	0.125196	0	0.000703	0.313104	0	0.003318	0.033772	0.156198	0.009032	0.014039	0.456881	0	0.003633	0.033772	0.156198	0.009032	0.014039	27.20392	0	6.457416	0.020202	0	0.00048
San Mateo	2021	HHDT	Aggregate	Aggregate	Diesel	1208.92	106361.1	10410.36	4.822382	51.44394	2.018739	0.057811	0.0743	0	0.008684	0.025532	0.060425	0.077659	0	0.034738	0.059576	1696.123	8387.493	0	0.006761	0.152113	0	0.266607	1.318397	0	0.14557	3.274961	0	0	0	0	0	0.165721	3.728293	0	0	0	0	0	0.533324	39.73895	0	0.016024	0.079241	0
San Mateo	2021	HHDT	Aggregate	Aggregate	Natural Ga	126.7771	5162.202	494.4307	1.346704	21.87477	0	0.004478	0.023163	0	0.009	0.02646	0.004681	0.02421	0	0.036	0.06174	3198.242	4155.154	0	3.391872	1.217623	0	0.651982	0.847055	0	0.128536	0.036371	0	0	0	0	0	3.552887	1.264291	0	0	0	0	0	10.85713	18.88665	0	0	0	0
San Mateo	2021	LDA	Aggregate	Aggregate	Gasoline	281462.2	8895614	1335477	0.041188	0	0.206593	0.001321	0	0.001823	0.002	0.01575	0.001437	0	0.001982	0.008	0.03675	261.7459	0	56.03422	0.00242	0	0.05694	0.004497	0	0.02671	0.0096	0	0.26575	0.102145	0.223773	0.177057	0.178303	0.014005	0	0.290961	0.102145	0.223773	0.177057	0.178303	0.629866	0	2.423839	0.00259	0	0.000555
San Mateo	2021	LDA	Aggregate	Aggregate	Diesel	3049.017	96691.52	14406.99	0.080533	0	0	0.00664	0	0	0.002	0.01575	0.006941	0	0	0.008	0.03675	206.756	0	0	0.000628	0	0	0.032499	0	0	0.01353	0	0	0	0	0	0.015403	0	0	0	0	0	0.197747	0	0	0.001955	0	0
San Mateo	2021	LDA	Aggregate	Aggregate	Electricity	6731.919	227344.6	33418.54	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2021	LDT1	Aggregate	Aggregate	Gasoline	38946.93	1231961	184643.5	0.074829	0	0.232267	0.00173	0	0.002249	0.002	0.01575	0.001881	0	0.002446	0.008	0.03675	298.0115	0	63.64168	0.003883	0	0.064322	0.006178	0	0.027593	0.016693	0	0.311613	0.130491	0.49711	0.245108	0.266151	0.024337	0	0.341175	0.130491	0.49711	0.245108	0.266151	0.882128	0	2.463111	0.002949	0	0.00063
San Mateo	2021	LDT1	Aggregate	Aggregate	Diesel	17.13189	301.423	58.6119	1.07976	0	0	0.146404	0	0	0.002	0.01575	0.153024	0	0	0.008	0.03675	411.4568	0	0	0.008976	0	0	0.064675	0	0	0.193251	0	0	0	0	0	0.220004	0	0	0	0	0	0.066027	0	0	0.00389	0	0
San Mateo	2021	LDT1	Aggregate	Aggregate	Electricity	251.7812	8876.24	1265.331	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2021	LDT2	Aggregate	Aggregate	Gasoline	124776.5	3966360	596103.2	0.062716	0	0.27794	0.001421	0	0.001831	0.002	0.01575	0.001546	0	0.001992	0.008	0.03675	320.7249	0	69.62036	0.00302	0	0.068545	0.005582	0	0.032265	0.012029	0	0.317083	0.093491	0.332713	0.20043	0.187904	0.017545	0	0.347165	0.093491	0.332713	0.20043	0.187904	0.726684	0	2.914491	0.003174	0	0.000689
San Mateo	2021	LDT2	Aggregate	Aggregate	Diesel	914.3532	32249.65	4526.673	0.038254	0	0	0.004445	0	0	0.002	0.01575	0.004646	0	0	0.008	0.03675	279.7984	0	0	0.000617	0	0	0.04398	0	0	0.013286	0	0	0	0	0	0.015125	0	0	0	0	0	0.1127	0	0	0.002645	0	0
San Mateo	2021	LDT2	Aggregate	Aggregate	Electricity	1346.583	38287.31	6798.974	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2021	LHDT1	Aggregate	Aggregate	Gasoline	8540.807	294678.5	127245.3	0.187228	0.038379	0.505697	0.002085	0	0.000366	0.002	0.03276	0.002267	0	0.000398	0.008	0.07644	1004.048	120.6229	18.95963	0.008807	0.123181	0.022764	0.011803	0.003232	0.040953	0.041578	0.439849	0.113884	0.095412	0.680616	0.01934	0.031725	0.060671	0.641827	0.124688	0.095412	0.680616	0.01934	0.031725	0.759022	3.757129	1.735062	0.009936	0.001194	0.000188
San Mateo	2021	LHDT1	Aggregate	Aggregate	Diesel	5376.148	207067.4	67625.18	1.203322	1.956837	0	0.017312	0.026832	0	0.003	0.03276	0.018095	0.028045	0	0.012	0.07644	539.0996	131.3706	0	0.006669	0.005098	0	0.084739	0.02065	0	0.143572	0.10976	0	0	0	0	0	0.163447	0.124954	0	0	0	0	0	0.556151	0.909745	0	0.005096	0.001242	0
San Mateo	2021	LHDT2	Aggregate	Aggregate	Gasoline	1180.837	40135.48	17592.71	0.209415	0.037867	0.513103	0.002029	0	0.000335	0.002	0.03822	0.002206	0	0.000365	0.008	0.08918	1145.87	138.6775	21.56691	0.007822	0.121399	0.022475	0.013634	0.003082	0.040307	0.034698	0.43401	0.112191	0.097486	0.716672	0.018746	0.03105	0.050631	0.633306	0.122834	0.097486	0.716672	0.018746	0.03105	0.627609	3.757621	1.759131	0.011339	0.001372	0.000213
San Mateo	2021	LHDT2	Aggregate	Aggregate	Diesel	2043.518	78128.83	25704.89	0.896184	1.934519	0	0.01684	0.026954	0	0.003	0.03822	0.017601	0.028173	0	0.012	0.08918	604.2541	210.1577	0	0.00626	0.005098	0	0.09498	0.033034	0	0.134779	0.10976	0	0	0	0	0	0.153437	0.124954	0	0	0	0	0	0.517242	0.909745	0	0.005712	0.001987	0
San Mateo	2021	MCY	Aggregate	Aggregate	Gasoline	15514.81	143935.1	31029.62	1.157112	0	0.273312	0.001926	0	0.003224	0.001	0.00504	0.00206	0	0.003423	0.004	0.01176	213.2371	0	61.23009	0.332174	0	0.26158	0.066746	0	0.015551	2.234514	0	1.982543	0.597211	2.102478	0.780635	1.269203	2.770018	0	2.157734	0.597211	2.102478	0.780635	1.269203	19.39604	0	9.137382	0.00211	0	0.000606
San Mateo	2021	MDV	Aggregate	Aggregate	Gasoline	75621.55	2430141	358800.7	0.073488	0	0.331739	0.001469	0	0.002007	0.002	0.01575	0.001597	0	0.002182	0.008	0.03675	385.661	0	84.65965	0.003574	0	0.080266	0.006245	0	0.034644	0.015383	0	0.393988	0.107459	0.357118	0.239762	0.221965	0.02189	0	0.431332	0.107459	0.357118	0.239762	0.221965	0.801832	0	3.32077	0.003816	0	0.000838
San Mateo	2021	MDV	Aggregate	Aggregate	Diesel	2032.67	73375.01	10021.82	0.035146	0	0	0.003798	0	0	0.002	0.01575	0.003969	0	0	0.008	0.03675	364.5115	0	0	0.000441	0	0	0.057296	0	0	0.009496	0	0	0	0	0	0.010811	0	0	0	0	0	0.167682	0	0	0.003446	0	0
San Mateo	2021	MDV	Aggregate	Aggregate	Electricity	499.1085	14927.81	2561.27	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2021	MH	Aggregate	Aggregate	Gasoline	1012.604	10475.38	101.3009	0.289108	0	0.33309	0.001533	0	0.000361	0.003	0.05586	0.001668	0	0.000393	0.012	0.13034	1724.952	0	25.35093	0.011174	0	0.031557	0.020013	0	0.036673	0.047014	0	0.129981	0.060707	1.482955	0.025377	0.060699	0.068602	0	0.142312	0.060707	1.482955	0.025377	0.060699	1.179087	0	2.932267	0.01707	0	0.000251
San Mateo	2021	MH	Aggregate	Aggregate	Diesel	369.5217	3896.478	36.95217	3.264603	0	0	0.055349	0	0	0.004	0.05586	0.057851	0	0	0.016	0.13034	1008.352	0	0	0.003968	0	0	0.158499	0	0	0.085434	0	0	0	0	0	0.09726	0	0	0	0	0	0.283679	0	0	0.009533	0	0
San Mateo	2021	MHDT	Aggregate	Aggregate	Gasoline	909.4785	54174.65	18196.85	0.499638	0.088488	0.387901	0.001283	0	0.000452	0.003	0.05586	0.001396	0	0.000492	0.012	0.13034	1743.713	537.0347	39.55954	0.015647	0.265774	0.041897	0.024692	0.00754	0.030481	0.076123	1.012741	0.22595	0.080554	0.479357	0.017312	0.028459	0.111078	1.477789	0.247387	0.080554	0.479357	0.017312	0.028459	1.76198	15.11679	5.049643	0.017255	0.005314	0.000391
San Mateo	2021	MHDT	Aggregate	Aggregate	Diesel	4915.917	311965.9	50724.24	2.71336	8.169784	1.490812	0.064641	0.02361	0	0.003	0.05586	0.067563	0.024678	0	0.012	0.13034	1050.501	887.7484	0	0.007414	0.005419	0	0.165124	0.139542	0	0.159621	0.116672	0	0	0	0	0	0.181717	0.132822	0	0	0	0	0	0.466643	2.520172	0	0.009925	0.008387	0
San Mateo	2021	OBUS	Aggregate	Aggregate	Gasoline	304.2296	17885.2	6087.026	0.373215	0.064976	0.307927	0.000981	0	0.000242	0.003	0.05586	0.001067	0	0.000263	0.012	0.13034	1778.4	378.4266	26.1745	0.011826	0.205731	0.029538	0.020024	0.005948	0.026976	0.056096	0.744988	0.147323	0.02347	0.27426	0.015546	0.031094	0.081855	1.087085	0.1613	0.02347	0.27426	0.015546	0.031094	1.246301	5.766914	3.125772	0.017599	0.003745	0.000259
San Mateo	2021	OBUS	Aggregate	Aggregate	Diesel	647.7138	45257.75	5917.718	2.965136	13.24071	1.697521	0.044716	0.043225	0	0.003	0.05586	0.046738	0.04518	0	0.012	0.13034	1215.387	1886.732	0	0.005772	0.033349	0	0.191042	0.296568	0	0.124271	0.718004	0	0	0	0	0	0.141474	0.817393	0	0	0	0	0	0.414399	8.333469	0	0.011482	0.017825	0
San Mateo	2021	SBUS	Aggregate	Aggregate	Gasoline	67.12178	3512.181	268.4871	0.724361	0.92226	0.510251	0.001768	0	0.000731	0.002	0.3192	0.001923	0	0.000795	0.008	0.7448	842.8819	2513.125	51.09537	0.022013	2.438558	0.067417	0.035004	0.088042	0.047324	0.10917	10.57835	0.390084	0.068525	0.560691	0.009267	0.021035	0.159301	15.43591	0.427093	0.068525	0.560691	0.009267	0.021035	2.431511	81.85897	10.64378	0.008341	0.024869	0.000506
San Mateo	2021	SBUS	Aggregate	Aggregate	Diesel	188.8153	5924.999	2178.903	8.563292	46.94516	0.589982	0.047323	0.061412	0	0.003	0.3192	0.049463	0.064189	0	0.012	0.7448	1168.903	3732.651	0	0.00571	0.014172	0	0.183735	0.586721	0	0.122925	0.305124	0	0	0	0	0	0.13994	0.347361	0	0	0	0	0	0.310277	5.196214	0	0.011043	0.035264	0
San Mateo	2021	UBUS	Aggregate	Aggregate	Gasoline	38.24087	926.4432	152.9635	0.286887	0	0.903525	0.00108	0	0.000458	0.00277	0.051797	0.001175	0	0.000498	0.011079	0.120859	2031.064	0	92.5355	0.005471	0	0.108325	0.022311	0	0.06829	0.019963	0	0.534519	0.047942	0.28654	0.008713	0.011861	0.02913	0	0.585231	0.047942	0.28654	0.008713	0.011861	0.346231	0	8.247734	0.020099	0	0.000916
San Mateo	2021	UBUS	Aggregate	Aggregate	Diesel	304.4449	24349.91	1217.78	3.893884	0	0	0.008125	0	0	0.007894	0.031881	0.008492	0	0	0.031575	0.074388	1767.879	0	0	0.243745	0	0	0.277886	0	0	0.003483	0	0	0	0	0	0.24876	0	0	0	0	0	0.395642	0	0	0.016713	0	0
San Mateo	2021	UBUS	Aggregate	Aggregate	Natural Ga	39.94428	2695.661	159.7771	0.49688	0	0	0.003228	0	0	0.00869	0.027979	0.003374	0	0	0.03476	0.065284	2042.655	0	0	6.540523	0	0	0.416409	0	0	0.093451	0	0	0	0	0	6.675083	0	0	0	0	0	50.89105	0	0	0	0	0

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

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STI	PM2.5_PM	PM2.5_PM	PM10_RUI	PM10_IDL	PM10_STR	PM10_PM	PM10_PM	CO2_RUNI	CO2_IDLE	CO2_STRE	CH4_RUNE	CH4_IDLE	CH4_STRE	N2O_RUNI	N2O_IDLE	N2O_STRE	ROG_RUN	ROG_IDLE	ROG_STRE	ROG_HOT	ROG_RUN	ROG_REST	ROG_DIUR	TOG_RUNI	TOG_IDLE	TOG_STRE	TOG_HOTS	TOG_RUNI	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
San Mateo	2022	HHDT	Aggregate	Aggregate	Gasoline	2.777853	472.715	55.57928	2.748403	0	0.013457	0.000841	0	0.000287	0.005	0.02646	0.000914	0	0.000312	0.02	0.06174	1993.356	0	47.87156	0.066368	0	0.000589	0.122942	0	0.000657	0.295052	0	0.003082	0.032556	0.152655	0.008908	0.013368	0.43054	0	0.003374	0.032556	0.152655	0.008908	0.013368	26.85146	0	6.517482	0.019726	0	0.000474
San Mateo	2022	HHDT	Aggregate	Aggregate	Diesel	1215.42	107659.4	10539.66	4.165704	50.99253	2.212041	0.03369	0.041677	0	0.008693	0.025559	0.035214	0.043562	0	0.034774	0.059637	1648.504	8572.517	0	0.004229	0.152316	0	0.259122	1.34748	0	0.091043	3.27933	0	0	0	0	0	0.103645	3.733267	0	0	0	0	0	0.380722	42.35619	0	0.015574	0.080989	0
San Mateo	2022	HHDT	Aggregate	Aggregate	Natural Ga	134.8882	5494.913	526.064	1.204197	21.39831	0	0.00421	0.020699	0	0.009	0.02646	0.004401	0.021634	0	0.036	0.06174	3157.131	4089.807	0	3.342946	1.208742	0	0.643602	0.833734	0	0.116887	0.033614	0	0	0	0	0	3.490479	1.252231	0	0	0	0	0	10.906	19.18613	0	0	0	0
San Mateo	2022	LDA	Aggregate	Aggregate	Gasoline	285883.4	8730359	1356969	0.03605	0	0.193174	0.00125	0	0.001731	0.002	0.01575	0.00136	0	0.001882	0.008	0.03675	254.7223	0	54.53474	0.002104	0	0.052491	0.004124	0	0.025575	0.008184	0	0.24181	0.09584	0.215371	0.166346	0.165388	0.01194	0	0.26475	0.09584	0.215371	0.166346	0.165388	0.581955	0	2.356656	0.002521	0	0.00054
San Mateo	2022	LDA	Aggregate	Aggregate	Diesel	3168.217	96975.13	14978.02	0.065635	0	0	0.000571	0	0	0.002	0.01575	0.005823	0	0	0.008	0.03675	201.5201	0	0	0.000546	0	0	0.031676	0	0	0.011746	0	0	0	0	0	0	0.013372	0	0	0	0	0	0.18472	0	0	0.001905	0	0
San Mateo	2022	LDA	Aggregate	Aggregate	Electricity	7621.214	256590.1	37762.18	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2022	LDT1	Aggregate	Aggregate	Gasoline	41432.75	1266108	196720.5	0.063699	0	0.213989	0.001597	0	0.002094	0.002	0.01575	0.001737	0	0.002277	0.008	0.03675	290.5103	0	61.94231	0.003311	0	0.058348	0.005522	0	0.026341	0.014006	0	0.277497	0.117193	0.451758	0.222711	0.237262	0.020427	0	0.303823	0.117193	0.451758	0.222711	0.237262	0.787692	0	2.384672	0.002875	0	0.000613
San Mateo	2022	LDT1	Aggregate	Aggregate	Diesel	16.25248	284.3033	56.05197	0.973767	0	0	0.132117	0	0	0.002	0.01575	0.13809	0	0	0.008	0.03675	403.6574	0	0	0.008132	0	0	0.063449	0	0	0.175077	0	0	0	0	0	0	0.199314	0	0	0	0	0	0.968724	0	0	0.003816	0	0
San Mateo	2022	LDT1	Aggregate	Aggregate	Electricity	359.7921	12796.34	1812.632	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2022	LDT2	Aggregate	Aggregate	Gasoline	132267.5	4056131	631991.8	0.054439	0	0.253266	0.00135	0	0.001756	0.002	0.01575	0.001468	0	0.00191	0.008	0.03675	309.9528	0	67.29858	0.002693	0	0.063591	0.005055	0	0.030403	0.010574	0	0.290905	0.08787	0.321064	0.193616	0.17912	0.015425	0	0.318504	0.08787	0.321064	0.193616	0.17912	0.675215	0	2.833844	0.003067	0	0.000666
San Mateo	2022	LDT2	Aggregate	Aggregate	Diesel	1027.683	34465.38	5067.758	0.036059	0	0	0.00431	0	0	0.002	0.01575	0.004505	0	0	0.008	0.03675	272.2158	0	0	0.000608	0	0	0.042789	0	0	0.013089	0	0	0	0	0	0	0.014901	0	0	0	0	0	0.113636	0	0	0.002573	0	0
San Mateo	2022	LDT2	Aggregate	Aggregate	Electricity	1743.196	47537.34	8780.26	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2022	LHDT1	Aggregate	Aggregate	Gasoline	8860.681	296397.6	132010.9	0.164845	0.037097	0.481227	0.002071	0	0.000356	0.002	0.03276	0.002252	0	0.000387	0.008	0.07644	992.6659	119.525	18.77226	0.007781	0.119821	0.021008	0.01052	0.003169	0.039372	0.036446	0.425239	0.104681	0.089625	0.634387	0.018517	0.029926	0.053182	0.620507	0.114613	0.089625	0.634387	0.018517	0.029926	0.672007	3.760132	1.686748	0.009823	0.001183	0.000186
San Mateo	2022	LHDT1	Aggregate	Aggregate	Diesel	5881.241	218648.3	73978.61	1.008919	1.817135	0	0.015674	0.026708	0	0.003	0.03276	0.016383	0.027916	0	0.012	0.07644	530.9331	129.4717	0	0.006468	0.005098	0	0.083455	0.020351	0	0.139258	0.10976	0	0	0	0	0	0.158536	0.124954	0	0	0	0	0.540902	0.909745	0	0.005019	0.001224	0
San Mateo	2022	LHDT2	Aggregate	Aggregate	Gasoline	1238.578	40924.28	18452.97	0.180484	0.036448	0.486851	0.002003	0	0.000323	0.002	0.03822	0.002179	0	0.000351	0.008	0.08918	1131.957	137.2937	21.32692	0.006639	0.117752	0.020688	0.011966	0.003025	0.038755	0.028918	0.417874	0.102654	0.089873	0.641758	0.017651	0.028619	0.042197	0.60976	0.112393	0.089873	0.641758	0.017651	0.028619	0.528397	3.761867	1.697237	0.011202	0.001359	0.000211
San Mateo	2022	LHDT2	Aggregate	Aggregate	Diesel	2262.753	83013.72	28462.58	0.757324	1.796044	0	0.016155	0.026868	0	0.003	0.03822	0.016885	0.028083	0	0.012	0.08918	595.284	207.3357	0	0.006136	0.005098	0	0.09357	0.03259	0	0.132094	0.10976	0	0	0	0	0	0.15038	0.124954	0	0	0	0	0.510466	0.909745	0	0.005628	0.00196	0
San Mateo	2022	MCY	Aggregate	Aggregate	Gasoline	16529.54	149168.5	33059.08	1.153943	0	0.273469	0.001956	0	0.003138	0.001	0.00504	0.002094	0	0.003337	0.004	0.01176	213.0842	0	60.80181	0.329874	0	0.259736	0.066591	0	0.015569	2.210717	0	1.965768	0.5674	1.990179	0.756717	1.245335	2.749517	0	2.139822	0.5674	1.990179	0.756717	1.245335	19.01708	0	9.173957	0.002109	0	0.000602
San Mateo	2022	MDV	Aggregate	Aggregate	Gasoline	80314	2499802	381574.2	0.06087	0	0.297162	0.001379	0	0.001889	0.002	0.01575	0.0015	0	0.002054	0.008	0.03675	372.4557	0	81.68051	0.002995	0	0.073	0.00551	0	0.032365	0.01208	0	0.352502	0.099964	0.339622	0.228954	0.209677	0.017601	0	0.385941	0.099964	0.339622	0.228954	0.209677	0.708583	0	3.157881	0.003686	0	0.000808
San Mateo	2022	MDV	Aggregate	Aggregate	Diesel	2272.544	78162.23	11166.87	0.030566	0	0	0.003443	0	0	0.002	0.01575	0.003598	0	0	0.008	0.03675	354.0945	0	0	0.000407	0	0	0.055659	0	0	0.008755	0	0	0	0	0	0	0.009967	0	0	0	0	0	0.162994	0	0	0.003347	0	0
San Mateo	2022	MDV	Aggregate	Aggregate	Electricity	791.7548	22645.44	4049.972	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
San Mateo	2022	MH	Aggregate	Aggregate	Gasoline	1080.218	11056.79	108.065	0.243025	0	0.33071	0.001467	0	0.000343	0.003	0.05586	0.001595	0	0.000373	0.012	0.13034	1694.184	0	24.78959	0.009323	0	0.030643	0.018018	0	0.037255	0.037663	0	0.123517	0.051682	1.255047	0.02193	0.051653	0.054958	0	0.135236	0.051682	1.255047	0.02193	0.051653	0.903608	0	2.791484	0.016765	0	0.000245
San Mateo	2022	MH	Aggregate	Aggregate	Diesel	406.2479	4155.317	40.62479	3.121607	0	0	0.049181	0	0	0.004	0.05586	0.051405	0	0	0.016	0.13034	992.5125	0	0	0.003823	0	0	0.156009	0	0	0.08231	0	0	0	0	0	0	0.093704	0	0	0	0	0	0.268912	0	0	0.009383	0	0
San Mateo	2022	MHDT	Aggregate	Aggregate	Gasoline	956.0975	56310.16	19129.6	0.401293	0.088681	0.375151	0.001267	0	0.000435	0.003	0.05586	0.001378	0	0.000473	0.012	0.13034	1713.287	529.7913	38.50416	0.01254	0.269583	0.039811	0.020842	0.007794	0.030516	0.060239	1.015611	0.211025	0.073361	0.429541	0.015892	0.025569	0.0879	1.481978	0.231046	0.073361	0.429541	0.015892	0.025569	1.376857	15.15013	4.694572	0.016954	0.005243	0.000381
San Mateo	2022	MHDT	Aggregate	Aggregate	Diesel	5059.28	329296.5	52181.07	1.960322	6.832488	1.758779	0.030959	0.013394	0	0.003	0.05586	0.032358	0.013999	0	0.012	0.13034	1018.114	861.5358	0	0.003362	0.004323	0	0.160033	0.135421	0	0.072373	0.093082	0	0	0	0	0	0.082391	0.105966	0	0	0	0	0.263752	2.486018	0	0.009619	0.008139	0
San Mateo	2022	OBUS	Aggregate	Aggregate	Gasoline	309.4493	17506.11	6191.461	0.33037	0.065013	0.303626	0.001018	0	0.000244	0.003	0.05586	0.001107	0	0.000265	0.012	0.13034	1751.792	374.5056	25.80105	0.010497	0.206047	0.028879	0.018303	0.005993	0.026834	0.049402	0.745556	0.143567	0.02327	0.273775	0.015372	0.030329	0.072088	1.087914	0.157188	0.02327	0.273775	0.015372	0.030329	1.088572	5.770329	3.038446	0.017335	0.003706	0.000255
San Mateo	2022	OBUS	Aggregate	Aggregate	Diesel	640.9896	44517.47	5852.545	2.479476	10.18109	1.868753	0.0211	0.014245	0	0.003	0.05586	0.022055	0.014889	0	0.012	0.13034	1198.226	1839.754	0	0.002945	0.026687	0	0.188345	0.289184	0	0.063402	0.574566	0	0	0	0	0	0.072178	0.654099	0	0	0	0	0.255295	8.204825	0	0.01132	0.017381	0
San Mateo	2022	SBUS	Aggregate	Aggregate	Gasoline	77.55394	3920.213	310.2158	0.624562	0.923435	0.499036	0.001669	0	0.000705	0.002	0.3192	0.001815	0	0.000767	0.008	0.7448	829.8891	2479.137	49.61529	0.018397	2.444511	0.064533	0.031012	0.089824	0.04739	0.090991	10.59598	0.372063	0.057941	0.422429	0.008158	0.017898	0.132774	15.46163	0.407362	0.057941	0.422429	0.008158	0.017898	2.030575	81.96501	10.05224	0.008212	0.024533	0.000491
San Mateo	2022	SBUS	Aggregate	Aggregate	Diesel	187.2294	5867.013	2160.601	8.328847	46.1304	0.635561	0.046003	0.057864	0	0.003	0.3192	0.048083	0.060481	0	0.012	0.7448	1161.116	3723.952	0	0.005644	0.013947	0	0.182511	0.585353	0	0.121506	0.300269	0	0	0	0	0	0.138326	0.341834	0	0	0	0	0.309322	5.361526	0	0.01097	0.035182	0
San Mateo	2022	UBUS	Aggregate	Aggregate	Gasoline	38.25826	926.8645	153.033	0.309327	0	0.947655	0.00108	0	0.000458	0.00277	0.051797	0.001175	0	0.000498	0.011079	0.120859	2030.959	0	92.62484	0.005436	0	0.113553	0.023538	0	0.07018	0.019935	0	0.563609	0.063702	0.409387	0.011307	0.01505	0.029089	0	0.617081	0.063702	0.409387	0.011307	0.01505	0.364269	0	8.245509	0.020098	0	0.000917
San Mateo	2022	UBUS	Aggregate	Aggregate	Diesel	304.5567	24358.67	1218.227	3.892763	0	0	0.008124	0	0	0.007894	0.031881	0.008491	0	0	0.031575	0.074388	1767.776	0	0	0.243684	0	0	0.27787	0	0	0.003482	0	0	0	0	0	0	0.248697	0	0	0	0	0	0.395545	0	0	0.016712	0	0
San Mateo	2022	UBUS	Aggregate	Aggregate	Natural Ga	39.98943	2699.2	159.9577	0.496847	0	0	0.003228	0	0	0.008689	0.027983	0.003374	0	0	0.034756	0.065295	2042.54	0	0	6.539969	0	0	0.416385	0	0	0.093443	0	0	0	0	0	0	6.674518	0	0	0	0	0	50.8863	0	0	0	0	0

Adjustment Factors for EMFAC2017 Gasoline Light Duty Vehicles						
Year	NOx Exhaust	TOG Evaporative	TOG Exhaust	PM Exhaust	CO Exhaust	CO2 Exhaust
NA	1	1	1	1	1	1
2021	1.0002	1.0001	1.0002	1.0009	1.0005	1.0023
2022	1.0004	1.0003	1.0004	1.0018	1.0014	1.0065
2023	1.0007	1.0006	1.0007	1.0032	1.0027	1.0126
2024	1.0012	1.0010	1.0011	1.0051	1.0044	1.0207
2025	1.0018	1.0016	1.0016	1.0074	1.0065	1.0309
2026	1.0023	1.0022	1.0020	1.0091	1.0083	1.0394
2027	1.0028	1.0028	1.0024	1.0105	1.0102	1.0475
2028	1.0034	1.0035	1.0028	1.0117	1.0120	1.0554
2029	1.0040	1.0042	1.0032	1.0129	1.0138	1.0629
2030	1.0047	1.0051	1.0037	1.0142	1.0156	1.0702
2031	1.0054	1.0061	1.0042	1.0155	1.0173	1.0770
2032	1.0061	1.0072	1.0047	1.0169	1.0189	1.0834
2033	1.0068	1.0083	1.0052	1.0182	1.0204	1.0893
2034	1.0075	1.0095	1.0058	1.0196	1.0218	1.0947
2035	1.0081	1.0108	1.0063	1.0210	1.0232	1.0997
2036	1.0088	1.0121	1.0069	1.0223	1.0244	1.1041
2037	1.0094	1.0134	1.0074	1.0236	1.0255	1.1080
2038	1.0099	1.0148	1.0079	1.0248	1.0265	1.1114
2039	1.0104	1.0161	1.0085	1.0259	1.0274	1.1143
2040	1.0109	1.0174	1.0090	1.0270	1.0281	1.1168
2041	1.0113	1.0186	1.0095	1.0279	1.0288	1.1189
2042	1.0116	1.0198	1.0099	1.0286	1.0294	1.1207
2043	1.0119	1.0207	1.0103	1.0293	1.0299	1.1221
2044	1.0122	1.0216	1.0106	1.0299	1.0303	1.1233
2045	1.0124	1.0225	1.0109	1.0303	1.0306	1.1243
2046	1.0125	1.0233	1.0111	1.0308	1.0309	1.1251
2047	1.0127	1.0240	1.0113	1.0311	1.0311	1.1258
2048	1.0128	1.0246	1.0115	1.0314	1.0313	1.1263
2049	1.0128	1.0252	1.0116	1.0316	1.0315	1.1268
2050	1.0129	1.0257	1.0117	1.0318	1.0316	1.1272
Enter Year: 2021	**1.0002**	**1.0001**	**1.0002**	**1.0009**	**1.0005**	**1.0023**

*PM Exhaust off model factor is only applied to the PM Exhaust emissions not start/idle

The off-model adjustment factors need to be applied only to emissions from gasoline light duty vehicles (LDA, LDT1, LDT2 and MDV). Please note that the adjustment factors are by calendar year and includes all model years.

Enter NA in the date field if adjustments do not apply

Attachment 4: Project Construction Emissions and Health Risk Calculations

141 3rd Avenue, Daly City, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021-2022	Construction	0.0386	CON_DPM	77.2	0.01923	2.42E-03	3039	7.97E-07

Construction Hours

hr/day =	11	(7am - 6pm)
days/yr =	365	
hours/year =	4015	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021-2022	Construction	0.0021	CON_DPM	4.3	0.00106	1.34E-04	3039	4.40E-08

Construction Hours

hr/day =	11	(7am - 6pm)
days/yr =	365	
hours/year =	4015	

141 3rd Avenue, Daly City, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2021-2022	Construction	CON_FUG	0.0046	9.2	0.00228	2.87E-04	3,039	9.46E-08

Construction Hours

hr/day =	11	(7am - 6pm)
days/yr =	365	
hours/year =	4015	

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2021-2022	Construction	CON_FUG	0.0024	4.8	0.00119	1.50E-04	3,039	4.94E-08

Construction Hours

hr/day =	11	(7am - 6pm)
days/yr =	365	
hours/year =	4015	

141 3rd Avenue, Daly City, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	(-)	($\mu g/m^3$)
2021-2022	0.1714	0.0597	**30.5**	**0.03**	**0.23**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	(-)	($\mu g/m^3$)
2021-2022	0.0095	0.0326	1.7	0.002	0.04

- Tier 4 Interim Engine Mitigation

Maximum Impacts at Milestone Academy Preschool

Construction Year	Unmitigated Emissions				
	Maximum Concentrations		Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)			
2021-2022	0.0188	0.00289	0.9	0.004	0.02

141 3rd Avenue, Daly City, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
				DPM Conc (ug/m3)	Age			Modeled DPM Conc (ug/m3)	Age				
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2021-2022	0.1714	10	2.33	2021-2022	0.1714	-	-			
1	1	0 - 1	2021-2022	0.1714	10	28.15	2021-2022	0.1714	1	0.49	0.0343	0.0597	0.2311
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						**30.48**				**0.49**			

* Third trimester of pregnancy

141 3rd Avenue, Daly City, 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	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*	2021-2022	0.0095	10	0.13	2021-2022	0.0095	-	-			
1	1	0 - 1	2021-2022	0.0095	10	1.55	2021-2022	0.0095	1	0.03	0.002	0.0326	0.0420
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00	0.000	0.0000	0.0000
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						**1.7**				**0.03**			

* Third trimester of pregnancy

141 3rd Avenue, Daly City, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Milestone Academy Preschool (2 years and oler) - 1.0 meters - Child Exposure

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

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

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

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

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	250	250	250
AT =	70	70	70
SAF =	1.00	3.00	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	2 - 3	2021-2022	0.0188	3	0.95
Total Increased Cancer Risk						**0.9**

* Children assumed to be 2 years of age and older

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.00377	0.00289	0.0217

Attachment 5: Community Risk Modeling Information and Calculations

BAAQMD Raster Screening Cancer Risk at MEI

BAAQMD Raster Screening $PM_{2.5}$ Concentration at MEI

BAAQMD Raster Screening Cancer Risk at Project Site

BAAQMD Raster Screening $PM_{2.5}$ Concentration at Project Site

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	**1/20/2021**
Contact Name	Casey Divine
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x103
Email	cdivine@illingworthrodkin.com
Project Name	141 3rd Ave
Address	141 3rd Ave
City	Daly City
County	San Mateo
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	15 du

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.

Table B: Google Earth data

Construction MEI

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	3603	Colma Auto Body Shop Inc	7252 Mission St	--	0.00001	--		Auto Body Coating		2018 Dataset	0.13	#VALUE!	0.000002	#VALUE!
1000	14858	D&J Auto Body Specialists Inc	7232 Mission St	--	0.001	--		Auto Body Coating		2018 Dataset	0.13	#VALUE!	0.0002	#VALUE!
970	20658	19th Auto Body Center	7323 Mission St	--	0.0003	--		Auto Body Coating		2018 Dataset	0.14	#VALUE!	0.00004	#VALUE!
400	112293	Hillside Shell	950 Hillside Blvd	60.19	0.26	--		Gas Dispensing Facility		2018 Dataset	0.07	4.0	0.02	#VALUE!

Footnotes:

1. Maximally exposed individual

Project Site

Distance from Receptor (feet) or MEI[1]	FACID (Plant No.)	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
950	3603	0.14	#VALUE!	0.000002	#VALUE!
990	14858	0.13	#VALUE!	0.0002	#VALUE!
750	20658	0.21	#VALUE!	0.0001	#VALUE!
210	112293	Used Health Risk Calculator	0.6	0.003	0.0000

2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003
    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

Gasoline Station Calculator

Permitted max throughput for 2020: 3,000,000 gallons/year

BAAQMD Evaluation

Controlled Rate (for all activities) = 0.67 lbs/10^3 gal throughput

Estimated Project Throughput: 3000 10^3 gal/year

Annual VOC Emissions			2,010	pounds/year	5.5	pounds/day
			1.01	tons/year		
Annual TAC Emissions	Factors		0.01		0.030	pounds/day
Benzene	0.00284	lbs/1000gal	0.00	tons/year	**0.023**	**pounds/day**
Ethylbenzene	0.00405	lbs/1000gal	0.01	tons/year	**0.033**	**pounds/day**
Hexane	0.0112	lbs/1000gal	0.02	tons/year	**0.092**	**pounds/day**
Toluene	0.0272	lbs/1000gal	0.04	tons/year	**0.224**	**pounds/day**
Xylene	0.0227	lbs/1000gal	0.03	tons/year	**0.187**	**pounds/day**

Source: BAAQMD SSIF Request for I&R Project 20-185 141 3rd Avenue (SSIF received 01/21/2021 A Flores)

Step 1:
Enter Facility Data

Plant Name	Hillside Shell
Plant No.	112293

Step 4:
Specify Source Type

Does facility have only diesel backup generators?	no
Is this analysis for a gas station?	yes

Note: Default generic distance multiplier used if source is not a generator or gas station.

Step 2:
Estimate Distance

What is the distance (m) from the facility boundary to the MEI?	65

Step 5:
Read

Total Cancer Risk	0.583	per 1,000,000
Total Chronic Hazard	0.003	
Total PM2.5 Concentration	0.000	µg/m³

Step 3:
Enter Emissions Data

Chemical Name	CAS No. (dashes removed)	Rate (lb/day)	Risk (# / 1,000,000)	Hazard (index)	Concentration (µg/m3)
Fine Particulate Matter (PM2.5)					
1,1,1-Trichloroethane	71556	0.00E+00			
1,1,2,2-Tetrachloroethane	79345	0.00E+00			
1,1,2-Trichloroethane	79005	0.00E+00			
1,1-Dichloroethane	75343	0.00E+00			
1,1-Dichloroethylene	75354	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268879	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001020	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673897	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653857	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00			
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00			
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00			
1,2-Dibromo-3-chloropropane	96128	0.00E+00			
1,2-Dibromoethane	106934	0.00E+00			
1,2-Dichloroethane	107062	0.00E+00			
1,2-Epoxybutane	106887	0.00E+00			
1,3-Butadiene	106990	0.00E+00			
1,3-Propane sultone	1120714	0.00E+00			
1,4-Dichlorobenzene	106467	0.00E+00			
1,4-Dioxane	123911	0.00E+00			
1,6-Dinitropyrene	42397648	0.00E+00			
1,8-Dinitropyrene	42397659	0.00E+00			
1-Nitropyrene	5522430	0.00E+00			
2',3,4,4',5-PeCB	65510443	0.00E+00			
2,3',4,4',5,5'-HxCB	52663726	0.00E+00			
2,3',4,4',5-PeCB	31508006	0.00E+00			
2,3,3',4,4',5'-HxCB	69782907	0.00E+00			
2,3,3',4,4',5,5'-HpCB	39635319	0.00E+00			
2,3,3',4,4',5-HxCB	38380084	0.00E+00			
2,3,3',4,4'-PeCB	32598144	0.00E+00			
2,3,4,4',5-PeCB	74472370	0.00E+00			
2,3,4,6,7,8-hexachlorodibenzofuran	60851345	0.00E+00			
2,3,4,7,8-Pentachlorodibenzofuran	57117314	0.00E+00			
2,3,7,8-Tetrachlorodibenzo-p-dioxin and related comp	1746016	0.00E+00			
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00			
2,4,6-Trichlorophenol	88062	0.00E+00			
2,4-Diaminoanisole	615054	0.00E+00			
2,4-Diaminotoluene	95807	0.00E+00			
2,4-Dinitrotoluene	121142	0.00E+00			
2-Aminoanthraquinone	117793	0.00E+00			
2-Nitrofluorene	607578	0.00E+00			
3,3',4,4',5,5'-HxCB	32774166	0.00E+00			
3,3',4,4',5-PeCB	57465288	0.00E+00			
3,3',4,4'-TCB	32598133	0.00E+00			
3,3-Dichlorobenzidine	91941	0.00E+00			
3,4,4'5-TCB	70362504	0.00E+00			
3-Methylcholanthrene	56495	0.00E+00			
4,4-Methylene bis(2-chloroaniline)	101144	0.00E+00			
4,4-Methylenedianiline	101779	0.00E+00			
4-Chloro-ortho-phenylenediamine	95830	0.00E+00			
4-Dimethylaminoazobenzene	60117	0.00E+00			
4-Nitropyrene	57835924	0.00E+00			
5-Methylchrysene	3697243	0.00E+00			

5-Nitroacenaphthene	602879	0.00E+00		
6-Nitrochrysene	7496028	0.00E+00		
7,12-Dimethylbenz(a)anthracene	57976	0.00E+00		
7H-dibenzo(c,g)carbazole	194592	0.00E+00		
Acetaldehyde	75070	0.00E+00		
Acetamide	60355	0.00E+00		
Acrolein	107028	0.00E+00		
Acrylamide	79061	0.00E+00		
Acrylic Acid	79107	0.00E+00		
Acrylonitrile	107131	0.00E+00		
Allyl chloride	107051	0.00E+00		
Ammonia	7664417	0.00E+00		
Aniline	62533	0.00E+00		
Arsenic	7440382	0.00E+00		
Arsine	7784421	0.00E+00		
Asbestos [1/(100 PCM fibers/m^3)]^-1	1332214	0.00E+00		
Benz(a)anthracene	56553	0.00E+00		
Benzene	71432	2.33E-02	2.99E+00	1.47E-02
Benzidine	92875	0.00E+00		
Benzo(a)pyrene	50328	0.00E+00		
Benzo(b)fluoranthene	205992	0.00E+00		
Benzo(j)fluoranthene	205823	0.00E+00		
Benzo(k)fluoranthene	207089	0.00E+00		
Benzyl Chloride	100447	0.00E+00		
Beryllium	7440417	0.00E+00		
Bis(2-chloroethyl) Ether	111444	0.00E+00		
Bis(2-chloromethyl) Ether	542881	0.00E+00		
Cadmium	7440439	0.00E+00		
Caprolactam	105602	0.00E+00		
Carbon Disulfide	75150	0.00E+00		
Carbon Monoxide	630080	0.00E+00		
Carbon Tetrachloride	56235	0.00E+00		
Carbonyl Sulfide	463581	0.00E+00		
Chlorinated paraffins (Avg. chain length C12; approx. 6(	108171262	0.00E+00		
Chlorine	7782505	0.00E+00		
Chlorine Dioxide	10049044	0.00E+00		
Chlorite	7758192	0.00E+00		
Chlorobenzene	108907	0.00E+00		
Chlorodibromomethane	124481	0.00E+00		
Chloroethane (Ethyl Chloride)	75003	0.00E+00		
Chloroform	67663	0.00E+00		
Chloropicrin	76062	0.00E+00		
Chromic Trioxide	1333820	0.00E+00		
Chromium-hexavalent	18540299	0.00E+00		
Barium chromate2	10294403	0.00E+00		
Calcium chromate2	13765190	0.00E+00		
Lead chromate2	7758976	0.00E+00		
Sodium dichromate2	10588019	0.00E+00		
Strontium chromate2	7789062	0.00E+00		
CHROMIC TRIOXIDE (as chromic acid mist)	1333820	0.00E+00		
Chrysene	218019	0.00E+00		
Copper	7440508	0.00E+00		
Copper and Copper Compounds	7440508	0.00E+00		
Cresol Mixtures	1319773	0.00E+00		
Cupferron	135206	0.00E+00		
Cyanide	57125	0.00E+00		
Di(2-ethylhexyl)phthalate	117817	0.00E+00		
Dibenz(a-h)acridine	226368	0.00E+00		
Dibenz(a-h)anthracene	53703	0.00E+00		
Dibenz(a-j)acridine	224420	0.00E+00		
Dibenzo(a-e)pyrene	192654	0.00E+00		
Dibenzo(a-h)pyrene	189640	0.00E+00		
Dibenzo(a-i)pyrene	189559	0.00E+00		
Dibenzo(a-l)pyrene	191300	0.00E+00		
Diesel Exhaust Particulate	85105	0.00E+00		
Diethanolamine	111422	0.00E+00		
Dimethylformamide	68122	0.00E+00		
Direct Black 38 (Technical Grade)	1937377	0.00E+00		
Direct Blue 6 (Technical Grade)	2602462	0.00E+00		
Direct Brown 95 (Technical Grade)	16071866	0.00E+00		
Epichlorohydrin	106898	0.00E+00		
Ethylbenzene	100414	3.33E-02	3.70E-01	3.15E-05
Ethylene Glycol	107211	0.00E+00		
Ethylene Glycol Monobutyl Ether	111762	0.00E+00		
Ethylene Glycol Monoethyl Ether	110805	0.00E+00		
Ethylene Glycol Monoethyl Ether Acetate	111159	0.00E+00		
Ethylene Glycol Monomethyl Ether	109864	0.00E+00		
Ethylene Glycol Monomethyl Ether Acetate	110496	0.00E+00		
Ethylene Oxide	75218	0.00E+00		

Ethylene Thiourea	96457	0.00E+00			
Fluorides	1101	0.00E+00			
Formaldehyde (gas)	50000	0.00E+00			
Glutaraldehyde	111308	0.00E+00			
Hexachlorobenzene	118741	0.00E+00			
Hexachlorocyclohexane (Technical Grade)	608731	0.00E+00			
Hexachlorocyclohexane- Alpha Isomer	319846	0.00E+00			
Hexachlorocyclohexane- Beta Isomer	319857	0.00E+00			
Hexachlorocyclohexane- Gamma Isomer	58899	0.00E+00			
Hydrazine	302012	0.00E+00			
Hydrogen Chloride	7647010	0.00E+00			
Hydrogen Cyanide	74908	0.00E+00			
Hydrogen Fluoride	7664393	0.00E+00			
Hydrogen Selenide	7783075	0.00E+00			
Hydrogen Sulfide	7783064	0.00E+00			
Indeno(1-2-3-c-d)pyrene	193395	0.00E+00			
Isophorone	78591	0.00E+00			
Isopropyl Alcohol	67630	0.00E+00			
Lead Acetate	301042	0.00E+00			
Lead and Lead Compounds	7439921	0.00E+00			
Lead Phosphate	7446277	0.00E+00			
Lead Subacetate	1335326	0.00E+00			
m-CRESOL	108394	0.00E+00			
m-XYLENE	108383	0.00E+00			
Maleic Anhydride	108316	0.00E+00			
Manganese & Manganese Compounds	7439965	0.00E+00			
Mercury (Inorganic)	7439976	0.00E+00			
Mercuric chloride	7487947	0.00E+00			
Methanol	67561	0.00E+00			
Methyl Bromide	74839	0.00E+00			
Methyl Ethyl Ketone	78933	0.00E+00			
Methyl Isocyanate	624839	0.00E+00			
Methyl Tertiary Butyl Ether	1634044	0.00E+00			
Methylene Chloride (Dichloromethane)	75092	0.00E+00			
Methylene Diphenyl Isocyanate (MDI)	101688	0.00E+00			
Michlers Ketone	90948	0.00E+00			
n-Hexane	110543	9.21E-02	2.49E-05		
n-Nitroso-n-methylethylamine	10595956	0.00E+00			
n-Nitrosodi-n-Butylamine	924163	0.00E+00			
n-Nitrosodi-n-Propylamine	621647	0.00E+00			
n-Nitrosodiethylamine	55185	0.00E+00			
n-Nitrosodimethylamine	62759	0.00E+00			
n-Nitrosodiphenylamine	86306	0.00E+00			
n-Nitrosomorpholine	59892	0.00E+00			
n-Nitrosopiperidine	100754	0.00E+00			
n-Nitrosopyrrolidine	930552	0.00E+00			
Naphthalene	91203	0.00E+00			
Nickel and Nickel Compounds	7440020	0.00E+00			
Nickel acetate	373024	0.00E+00			
Nickel carbonate	3333673	0.00E+00			
Nickel carbonyl	13463393	0.00E+00			
Nickel hydroxide	12054487	0.00E+00			
Nickelocene	1271289	0.00E+00			
Nickel Oxide	1313991	0.00E+00			
Nickel Refinery Dust	1146	0.00E+00			
Nickel Subsulfide	12035722	0.00E+00			
Nitric Acid	7697372	0.00E+00			
Nitrogen Dioxide	10102440	0.00E+00			
o-CRESOL	95487	0.00E+00			
o-XYLENE	95476	0.00E+00			
Oleum	8014957	0.00E+00			
Ozone	10028156	0.00E+00			
p-Chloro-o-toluidine	95692	0.00E+00			
p-Cresidine	120718	0.00E+00			
p-CRESOL	106445	0.00E+00			
p-Nitrosodiphenylamine	156105	0.00E+00			
p-XYLENE	106423	0.00E+00			
Pentachlorophenol	87865	0.00E+00			
Perchloroethylene	127184	0.00E+00			
Phenol	108952	0.00E+00			
Phosgene	75445	0.00E+00			
Phosphine	7803512	0.00E+00			
Phosphoric Acid	7664382	0.00E+00			
Phthalic Anhydride	85449	0.00E+00			
Polychlorinated Biphenyls	1336363	0.00E+00			
Potassium Bromate	7758012	0.00E+00			
Propylene	115071	0.00E+00			

Propylene Glycol Monomethyl Ether	107982	0.00E+00			
Propylene oxide	75569	0.00E+00			
Selenium	7782492	0.00E+00			
Selenium sulfide	7446346	0.00E+00			
Silica (crystalline, respirable)	7631869	0.00E+00			
Sodium hydroxide	1310732	0.00E+00			
Styrene	100425	0.00E+00			
Sulfates	9960	0.00E+00			
Sulfur Dioxide	7446095	0.00E+00			
Sulfuric Acid	7664939	0.00E+00			
Sulfur Trioxide	7446719	0.00E+00			
Tertiary-butyl acetate	540885	0.00E+00			
Tetrachloroethylene	127184	0.00E+00			
Thioacetamide	62555	0.00E+00			
Toluene	108883	2.24E-01		1.41E-03	
Toluene Diisocyanates	26471625	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	584849	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	91087	0.00E+00			
Trichloroethylene	79016	0.00E+00			
Triethylamine	121448	0.00E+00			
Urethane	51796	0.00E+00			
Vanadium pentoxide	1314621	0.00E+00			
Vinyl acetate	108054	0.00E+00			
Vinyl chloride	75014	0.00E+00			
Xylenes (technical mixture of m, o, p-isomers)	1330207	1.87E-01		5.04E-04	
Vanadium	7440622	0.00E+00			
	TOTAL UNADJUSTED Risk Values		**3.355**	**0.017**	**0.000**