JOBTRAIN AIR QUALITY & GREENHOUSE GAS ASSESSMENT

East Palo Alto, California

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Introduction

The purpose of this report is to address air quality, community health risk, and greenhouse gas (GHG) impacts associated with the proposed office project located at 2535 Pulgas Avenue in East Palo Alto, California. The air quality impacts and GHG emissions would be associated with the demolition of the existing uses at the site, construction of the new building and infrastructure, and operation of the project. Air pollutant and GHG emissions associated with the construction and operation of the project were predicted using appropriate computer models. In addition, the potential health risk impact (construction and operation) and the impacts of existing toxic air contaminant (TAC) sources affecting the nearby and proposed sensitive receptors were evaluated. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The approximately 3.86-acre total project site is located at 2535 Pulgas Avenue and is within the Ravenswood/4 Corners Specific Plan area. The total project site is currently developed with two single-story buildings, approximately six accessory structures, and storage areas used for equipment and vehicle storage. The proposed project would demolish the existing buildings totaling 5,741 square feet (sf). It would then construct an approximately 110,000-sf, four-story office building with approximately 55,000-sf for JobTrain and approximately 55,000-sf for general office space. There would also be 357 surface parking lot spaces. The new office building would also include a 100-kilowatt (kW) emergency generator powered by a 134-horsepower (hp) diesel engine in the center of the southern half on the roof of the office building.

The first floor of the proposed building would feature approximately 10,500 square feet of ground floor open space for a carpentry yard and a children's play area. The carpentry classes utilizing the area would use basic small carpentry tools (i.e., hammers, saws) and no large equipment (i.e., forklifts). At the current JobTrain facility in Menlo Park lumber and material deliveries currently occur three to four times per year, but with the increased storage space available for carpentry uses at the proposed project, the frequency of deliveries is expected to diminish due to the increased amount of materials that can be stored onsite. However, for the purpose of this analysis, a maximum of four deliveries per year is conservatively assumed. The daycare would only be available to JobTrain students. The daycare's maximum capacity would be 24 children and the ages would be from three to five years old.

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 ($PM_{2.5}$).

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

Air Pollutants of Concern

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

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

Toxic Air Contaminants

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

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. The most recent Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines were published in February of 2015.[2] See *Attachment 1* for a detailed description of the community risk modeling methodology used in this assessment.

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

[2] 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.

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, infants and 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 the single-family residences to the west along Illinois Street. There are additional residences south of the site at further distances. Further, the EPA Center Arts located southeast of the site hosts children ages 13 and older during daytime hours.

Regulatory Setting

<u>Federal Regulations</u>

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 nitrogen oxides, or NO_X, and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified diesel particulate matter 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 PM and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[3]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 parts per million by weight [ppmw] to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra-low sulfur diesel (ULSD) is currently required for use by all vehicles in the U.S.

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

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

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles[4]. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

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

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

Bay Area Air Quality Management District (BAAQMD)

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

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards and California Ambient Air Quality Standards. The District also has permit authority over most types of stationary equipment utilized for the proposed project. The BAAQMD is responsible for permitting and inspection of stationary sources;

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

enforcement of regulations, including setting fees, levying fines, and enforcement actions; and ensuring that public nuisances are minimized.

BAAQMD's Community Air Risk Evaluation (CARE) program addresses communities with higher air pollution levels. The program identifies areas where vulnerable populations are exposed to higher levels, applies the scientific methods and strategies to reduce air pollution health impacts in these areas and engages the community and other agencies to develop additional actions to reduce impacts. BAAQMD has developed maps that show areas with elevated pollution levels and identified impacted areas. East Palo Alto does not fall under any of these impacted areas.

The BAAQMD *California Environmental Quality Act (CEQA) Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of their *CEQA Guidelines*. In May 2011, the updated BAAQMD *CEQA Air Quality Guidelines* were amended to include a risk and hazards threshold for new receptors and modify procedures for assessing impacts related to risk and hazard impacts.

<u>BAAQMD Stationary Source Rules and Regulations</u>

Combustion equipment associated with the proposed project that includes new diesel engines to power generators would establish new sources of particulate matter and gaseous emissions. Emissions would primarily result from the testing of the emergency backup generators, operation of the boilers for space and water heating and some minor emissions from cooling towers. The project would also generate emissions from vehicles traveling to and from the project.

Certain emission sources would be subject to BAAQMD Regulations and Rules. The District's rules and regulations that may apply to the project include:

- Regulation 2 – Permits
  - Rule 2-1: General Requirements
  - Rule 2-2: New Source Review
- Regulation 6 – Particulate Matter and Visible Emissions
- Regulation 9 – Inorganic Gaseous Pollutants
  - Rule 9-1: Sulfur Dioxide
  - Rule 9-7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, And Process Heaters
  - Rule 9-8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

[5] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines*. May. (Updated May 2017)

Permits

Rule 2-1-301 requires that any person installing, modifying, or replacing any equipment, the use of which may reduce or control the emission of air contaminants, shall first obtain an Authority to Construct (ATC).

Rule 2-1-302 requires that written authorization from the BAAQMD in the form of a Permit to Operate (PTO) be secured before any such equipment is used or operated.

Rule 2-1 lists sources that are exempt from permitting. At the proposed facility, the diesel fuel storage tanks are expected to be exempt from permitting.

New Source Review

Rule 2-2, New Source Review (NSR), applies to all new and modified sources or facilities that are subject to the requirements of Rule 2-1-301. The purpose of the rule is to provide for review of such sources and to provide mechanisms by which no net increase in emissions will result.

Rule 2-2-301 requires that an applicant for an ATC or PTO apply Best Available Control Technology (BACT) to any new or modified source that results in an increase in emissions and has emissions of precursor organic compounds, non-precursor organic compounds, NOx, SO_2, PM_{10}, or CO of 10.0 pounds or more per highest day. Based on the estimated emissions from the proposed project, BACT will be required for NOx emissions from the diesel-fueled generator engines.

BACT for Diesel Generator Engines

Since the generators will be used exclusively for emergency use during involuntary loss of power, the BACT 2 levels listed for IC compression engines in the BAAQMD BACT Guidelines would apply. The BACT 2 NOx emission factor limit is 6.9 grams per horsepower hour (g/hp-hr). The project's proposed engines will have emissions lower than the BACT 2 level and, as such, will comply with the BACT requirements.

Offsets

Rule 2-2-302 require that offsets be provided for a new or modified source that emits more than 10 tons per year of NOx or precursor organic compounds. It is not expected that emissions of any pollutant will exceed the offset thresholds. Thus, is not expected that offsets for the proposed project would be required.

Prohibitory Rules

Regulation 6 pertains to particulate matter and visible emissions. Although the engines will be fueled with diesel, they will be modern, low emission engines. Thus, the engines are expected to comply with Regulation 6.

Rule 9-1 applies to sulfur dioxide. The engines will use ultra-low sulfur diesel fuel (less than 15 ppm sulfur) and will not be a significant source of sulfur dioxide emissions and are expected to comply with the requirements of Rule 9-1.

Rule 9-7 limits the emissions of NOx CO from industrial, institutional and commercial boilers, steam generators and process heaters. This regulation typically applies to boilers with a heat rating of 2 million British Thermal Units (BTU) per hour

Rule 9-8 prescribes NOx and CO emission limits for stationary internal combustion engines. Since the proposed engines will be used with emergency standby generators, Regulation 9-8-110 exempts the engines from the requirements of this Rule, except for the recordkeeping requirements (9-8-530) and limitations on hours of operation for reliability-related operation (maintenance and testing). The engines will not operate more than 50 hours per year, which will satisfy the requirements of 9-8-111.

Stationary Diesel Airborne Toxic Control Measure

The BAAQMD administers the state's Airborne Toxic Control Measure (ACTM) for Stationary Diesel engines (section 93115, title 17 CA Code of Regulations). The project's stationary sources will be new stationary emergency standby diesel engines larger than 50-hp. Since the engines will have an uncontrolled PM emission factor of less than 0.15 g/hp-hour and operate no more than 50 hours per year, the engines will comply with the requirements of the ACTM.

<u>Vista 2035 East Palo Alto General Plan</u>

On October 4, 2016, the City of East Palo Alto adopted the Vista 2035 East Palo Alto General Plan, which was an update to the City's 1999 General Plan and Zoning Ordinance.[6] The final version was published March 2017. The General Plan is the foundation for establishing goals, purposes, zoning and activities allowed on each land parcel to provide compatibility and continuity to the entire region as well as each individual neighborhood. This general plan includes goals and policies to improve air quality within East Palo Alto. The following goal and policy apply to the project.

Goal HE-4. **Safely and systemically address toxics, legacy pollutants, and hazardous materials**

Intent: To protect residents and visitors against harmful health and other impacts associated with dangerous materials that may pose a threat to life and property, and may dictate costly public improvements. Reduction or elimination of these hazards can be accomplished with concerted efforts.

[6] City of East Palo Alto, 2017. *Vista 2035 East Palo Alto General Plan*. March. Web: http://www.ci.east-palo-alto.ca.us/DocumentCenter/View/3187

Policies:

4.2 Pollutants. Continue to work with state, federal, regional, and local agencies to eliminate and reduce concentrations of regulated legacy pollutants.

Ravenswood/4 Corners Transit Oriented Development (TOD) Specific Plan DEIR

The Ravenswood and 4 Corners TOD Specific Plan is a document that outlines and provides detailed regulations for how this district will develop and expand in the near future.[7] This specific plan focuses on development (i.e. residential and commercial uses) that is near transit stops and improve proximity to services. The following performance standard is applicable to the project.

> *Air Contaminants* - No smoke, soot, flash, dust, cinders, direct, acids, fumes, vapors, odors, toxic, or radioactive substances waste or particulate, solid, liquid, or gaseous matter shall be introduced into the outdoor atmosphere, alone or in any combination, in a quantity or at a duration that interferes with safe occupancy of the site or surrounding sites. In addition, all uses shall be subject to any emission limits determined by BAAQMD

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 that were used in this analysis are summarized in Table 1.

[7] City of East Palo Alto, 2013.*Ravenswood / 4 Corners TOD Specific Plan.* February. Web: https://www.ci.east-palo-alto.ca.us/Archive/ViewFile/Item/125

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1000-foot zone of influence)**	
Excess Cancer Risk	>10 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 $\mu g/m^3$	>0.8 $\mu g/m^3$	
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions	Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) *		
Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases. *BAAQMD does not have a recommended post-2020 GHG threshold.			

AIR QUALITY IMPACTS AND MITIGATION MEASURES

Impact: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The Bay Area is considered a non-attainment area for ground-level O_3 and $PM_{2.5}$ under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for O_3, $PM_{2.5}$ and PM_{10}, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for O_3 precursor pollutants (ROG and NOx), PM_{10}, and $PM_{2.5}$ and apply to both construction period and operational period impacts.

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.[8] 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 Inputs

Land Use Inputs

The proposed project 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
General Office Building	55	1,000-sf	55,000	3.86
Parking Lot	357	Space	92,117	
Junior College (2Yr)	198	Student	65,500	

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,

[8] See CARB's EMFAC2017 Web Database at https://www.arb.ca.gov/emfac/2017/

including equipment list and schedule, were based on information provided by the project applicant.

The construction equipment worksheet 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 provided. 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 May 2021 and the project would be built out over a period of approximately 19 months, or 358 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 demolition and grading volumes by assuming each truck could carry 10 tons per load. 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 or asphalt 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 emission rates from the years 2021-2022 for San Mateo County were used. 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]	73.6% LDA 8.6% LDT1 27.8% LDT2	76.6% MHDT 23.4% 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	130	-	446	5,728-sf of existing building demolition and 2,100 tons of pavement demolition. CalEEMod default worker trips.
Grading	510	-	1,293	5,018-cy of export volume. 5,325-cy of import volume.[9] CalEEMod default worker trips.
Trenching	480	-	-	CalEEMod default worker trips.
Building Construction	15,792	6,580	1,280	640 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	2,397	-	-	CalEEMod default worker trips.
Paving	110	-	240	1,000-cy of asphalt for paving. 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

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

[9] The amount of soil imported for the proposed project has increased from 5,325 cubic yard to 6,000 cubic yards since the time of this analysis. This increased amount would slightly increase construction emissions, and given how far below the thresholds the criteria pollutant emissions are and how far away the off-site sensitive receptors are, the change in construction emissions and health risk would be negligible and not change the impact results.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Fugitive
Construction Emissions Per Year (Tons)				
2021	0.10	1.07	0.05	0.05
2022	0.77	1.18	0.06	0.05
Average Daily Construction Emissions Per Year (pounds/day)				
2021 (175 construction workdays)	1.18	12.22	0.62	0.52
2022 (183 construction workdays)	8.38	12.86	0.61	0.51
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

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

Mitigation 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 Mitigation 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.

<u>Operational Period Emissions</u>

Operational air emissions from the project would be generated primarily from autos driven by future employees, students, and vendors. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was also used to estimate emissions from operation of the proposed project assuming full build-out.

Land Uses

The project land uses were entered into CalEEMod as described above for the construction period modeling.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest year of full operation would be 2023. Emissions associated with build-out later than 2023 would be lower.

Trip Generation Rates

CalEEMod allows the user to enter specific vehicle trip generation rates. Therefore, the project-specific daily trip generation rate provided by the traffic consultant was entered into the model.[10] The project would produce 996 net daily trips taking into account the *25% TDM Trip Reduction for General Office* and *6% Additional TDM Trip Reduction for JabTrain.* The daily trip generation

[10] Hexagon Transportation Consultants, Inc., *Updated Transportation Impact Analysis for the Proposed New Office Building at 2535 Pulgas Avenue in East Palo Alto*, January 8,2021.

was calculated using the size of the project land uses and the adjusted total automobile trips per land use. The Saturday and Sunday trip rates were adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips to the default weekday rate with the project-specific daily weekday trip rate. The default trip types and lengths specified by CalEEMod were used.

EMFAC2017 Adjustment

The vehicle emission factors and fleet mix used in CalEEMod are based on EMission FACtors from 2014 (EMFAC2014), which is an older CARB emission inventory for on road and off road mobile sources. Since the release of CalEEMod Version 2016.3.2, new emission factors have been produced by CARB. EMFAC2017 became available for use in March 2018 and approved by the EPA in August 2019. It includes the latest data on California's car and truck fleets and travel activity. Additionally, CARB has recently released EMFAC off-model adjustment factors to account for the Safer Affordable Efficient (SAFE) Vehicle Rule Part one.[11,12] The SAFE vehicle Rule Part One revoked California's authority to set its own GHG emission standards and set zero emission vehicle mandates in California. As a result of this ruling, mobile criteria pollutant and GHG emissions would increase. Therefore, the CalEEMod vehicle emission factors and fleet mix were updated with the emission rates and fleet mix from EMFAC2017, which were adjusted with the CARB EMFAC off-model adjustment factors. More details about the updates in emissions calculation methodologies are available in the EMFAC2017 Technical Support Document.[13]

Energy

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. GHG emissions modeling includes those indirect emissions from electricity consumption. The electricity produced emission rate was modified in CalEEMod. CalEEMod has a default emission factor of 641.3 pounds of CO_2 per megawatt of electricity produced, which is based on Pacific Gas and Electric's (PG&E) 2008 emissions rate. However, PG&E published in 2019 emissions rates for 2010 through 2017, which showed the emission rate for delivered electricity had been reduced to 210 pounds CO2 per megawatt of electricity delivered in the year 2017.[14]

Peninsula Clean Energy (PCE) now provides electricity to 90-percent of San Mateo County, with 50 percent renewable and 90 percent being carbon free electricity. The 2018 rate provided by PCE was 129.77 pounds of CO_2 per megawatt of electricity delivered.[15] The CO_2 intensity rate input into CalEEMod was adjusted to account for 90 percent of PCE's rate and 10 percent of PG&E's

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[11] California Air Resource Board, 2019. *EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One*. November. Web: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf

[12] California Air Resource Board, 2020. *EMFAC Off-Model Adjustment Factors for Carbon Dioxide ($CO_2$0 Emissions to Accounts for the SAFE Vehicles Rule Part One and the Final SAFE Rule*. June. Web: https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery

[13] See CARB 2018: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-modeling-tools-emfac

[14] PG&E, 2019. *Corporate Responsibility and Sustainability Report*. Web: http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf

[15] Correspondence with Michael Totah, Peninsula Clean Energy, August 30, 2019.

rate. Therefore, an electricity emission rate of 138 pounds per of CO_2 per megawatt of electricity delivered was used for this analysis.

Emergency Generator

The project would include a 100-kW emergency generator that is powered by a diesel engine. Emissions from the testing and maintenance of the proposed generator engine were calculated for a 134-hp diesel engine. The generator would be located in the center of the southern half on the roof of the office building. The CalEEMod modeling assumed 50 hours of annual operation for testing and maintenance purposes.

Other Inputs

Default model assumptions for emissions associated with solid waste generation use were applied to the project. Water/wastewater use were changed to 100% aerobic conditions to represent wastewater treatment plant conditions.

Existing Uses

A CalEEMod model run was developed to compute emissions from use of the existing land uses as if it were operating in 2023. Inputs for this modeling scenario included 4,500-sf[16] entered as "General Light Industry" and 3.76 acres entered as "Oher Non-Asphalt Surfaces". The existing trip generation rates and other inputs were applied to the existing modeling in the same manner described for the proposed project. Historical energy usage rates were assigned by CalEEMod.

Summary of Computed Operational Period Emissions

Annual emissions were predicted using CalEEMod. The daily emissions were estimated assuming 365 days of operation. Table 5 shows average daily emissions of ROG, NO_X, total PM_{10}, and total $PM_{2.5}$ during operation of the project. The operational period emissions would not exceed the BAAQMD significance thresholds.

Table 5. Operational Period Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2023 Project Operational Emissions (*tons/year*)	0.94 tons	0.63 tons	0.90 tons	0.25 tons
2023 Existing Operational Emissions (*tons/year*)	0.11 tons	0.11 tons	0.21 tons	0.05 tons
Net Annual Emissions (*tons/year*)	0.83 tons	0.52 tons	0.69 tons	0.20 tons
BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Threshold?	No	No	No	No
Net 2023 Project Operational Emissions (*lbs/day*)[1]	4.54 lbs.	2.85 lbs.	3.78 lbs.	1.08 lbs.
BAAQMD Thresholds (pounds/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	No	No	No	No

Notes: [1] Assumes 365-day operation.

[16] The revised existing industrial use is 5,741-sf. This would 1) have a negligible increase of existing use operational emissions that would not change the impact finding and 2) using the smaller existing use/emissions to net out the project's overall operational emissions would yield a higher total net project operational emissions, so the more conservative scenario was analyzed in the report.

Impact: Expose sensitive receptors to substantial pollutant concentrations?

Project impacts related to increased community risk would occur by introducing a new sources of TAC emissions with the potential to adversely affect existing sensitive receptors in the project vicinity or by significantly exacerbating existing cumulative TAC impacts. This project would introduce new sources of TACs during construction (i.e., on-site construction and truck hauling emissions) and operation (i.e., emergency diesel generators and mobile sources).

Project construction activity would generate dust and equipment exhaust that would affect nearby sensitive receptors. The project's operation would include the installation of an emergency generator powered by diesel engines that would have TAC and air pollutant emissions. The project would generate some traffic, consisting of light-duty vehicles. However, the number of net daily trips generated by the project are low (i.e., 996 net daily trips)[17] and emissions from automobile traffic generated by the project would be spread out over a broad geographical area and not localized. Therefore, project traffic was not be considered a local source of substantial TACs or $PM_{2.5}$ that could lead to health impacts.

Project impacts to existing sensitive receptors were addressed for temporary construction activities and long-term operational conditions. There are also several sources of existing TACs and localized air pollutants in the vicinity of the project. The impact of the existing sources of TAC was also assessed in terms of the cumulative risk which includes the project contribution, as well as the risk on the new sensitive receptors introduced by the project.

Community Risk Methodology for Construction and Operation

Community risk impacts were addressed by predicting increased cancer risk, the increase in annual $PM_{2.5}$ concentrations and computing the Hazard Index (HI) for non-cancer health risks. The risk impacts from the project are the combination of risks from construction and operation sources. These sources include on-site construction activity, construction truck hauling, and increased traffic from the project. To evaluate the increased cancer risks from the project, a 30-year exposure period was used, per BAAQMD guidance,[18] with the sensitive receptors being exposed to both project construction and operation emissions during this timeframe.

The project increased cancer risk is computed by summing the project construction cancer risk and operation cancer risk contributions. Unlike, the increased maximum cancer risk, the annual $PM_{2.5}$ concentration and HI values are not additive but based on the annual maximum values for the entirety of the project. The project maximally exposed individual (MEI) is identified as the sensitive receptor that is most impacted by the project's construction and operation.

The methodology for computing community risks impacts is contained in *Attachment 1*. This involved the calculation of TAC and $PM_{2.5}$ emissions, dispersion modeling of these emissions, and computations of cancer risk and non-cancer health effects.

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[17] Hexagon Transportation Consultants, Inc., *Updated Transportation Impact Analysis for the Proposed New Office Building at 2535 Pulgas Avenue in East Palo Alto*, January 8,2021.

[18] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

Modeled Sensitive Receptors

Receptors for this assessment included locations where sensitive populations would be present for extended periods of time (i.e., chronic exposures). This includes the existing residences to the west of the site and other existing residences to the south of the site, as shown in Figure 1. Residential receptors are assumed to include all receptor groups (i.e., infants, children, and adults) with almost continuous exposure to project emissions. Community risks were also computed for children at the EPA Center Arts (13 years and older).

Community Health Risk from Project Construction

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issue associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. 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 $PM_{2.5}$.[19] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that increased cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod and EMFAC2017 models 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 0.0928 tons (186 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 0.0587 tons (117 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) 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.[20] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

[19] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.
[20] Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May.

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[21] 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 6.5 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 6.5-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.

The modeling used a five-year data set (2013-2017) of hourly meteorological data from the Moffett Federal Airfield that was prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring between 7:00 a.m. to 4:00 p.m., when the majority of construction activity would occur. 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. A receptor height of 5 feet (1.5 meters) was used to represent the breathing height on the first floor of nearby single-family residences and older children at the EPA Center Arts.

Summary of Construction Community Risk Impacts

The increased cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations, as described in *Attachment 1*. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. The range of infant through adult exposures were assumed to occur at all residences and child exposure was assumed to occur at the EPA Center Arts during the entire construction period. Infant exposure at residences was used as a worst-case assumption, while child and adult exposures would be less.

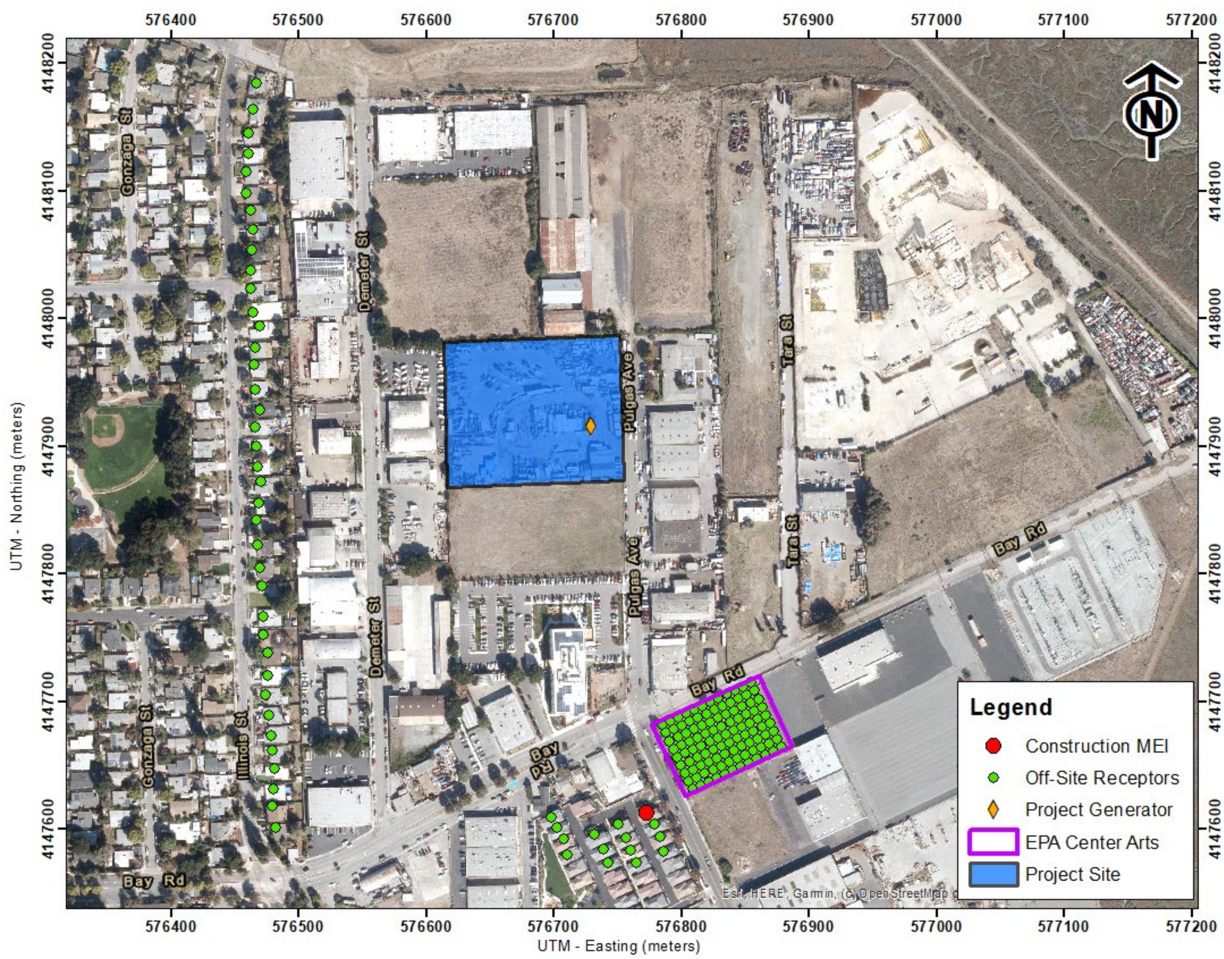
The maximum modeled annual $PM_{2.5}$ concentration was calculated based on combined exhaust and fugitive concentrations. The maximum computed HI values was based on the ratio of the maximum DPM concentration modeled and the chronic inhalation refence exposure level of 5 $\mu g/m^3$.

[21] 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

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 to find the MEI. Results of this assessment indicated that the MEI most affected by construction was located on the first floor (5 feet above ground) of a single-family residence to the south of the project site along Pulgas Avenue. The location of the MEI and nearby sensitive receptors are shown in Figure 1. Table 6 lists the community risks from construction at the location of the residential MEI. *Attachment 4* to this report includes the emission calculations used for the construction 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 art center. The maximum increased cancer risks were adjusted using child exposure parameters. The uncontrolled cancer risk, $PM_{2.5}$ concentration, and HI at the nearby art center would not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 6.

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



Community Risks from Project Operation – Traffic and Generators

Operation of the project would have long-term emissions from mobile sources (i.e., traffic) and stationary sources (i.e., generator). While these emissions would not be as intensive at or near the site as construction activity, they would contribute to long-term effects to sensitive receptors.

Project Traffic

Diesel powered vehicles are the primary concern with local traffic-generated TAC impacts. This project would generate 996 daily trips with a majority of the trips being from light-duty vehicles (i.e., passenger cars). A truck would come three to four times a year to unload lumber for the carpentry area, but the frequency would diminish as storage becomes unavailable, and these few truck trips would have negligible emissions compared to the entirety of the project. Per BAAQMD recommended risks and methodology, a road with less than 10,000 total vehicle per day is considered a low-impact source of TACs and do not need to be considered in the CEQA analysis.[22] Therefore, emissions from project traffic are considered negligible and was not included within this analysis.

Project Emergency Diesel Generator

The project would include one 100-kW emergency generator powered by a 134-HP diesel engine located on the center of the southern half of the office building's roof. Figure 1 shows the location of the modeled emergency generator. Operation of a diesel generator would be a source of TAC emissions. The generator would be operated for testing and maintenance purposes, with a maximum of 50 hours per year of non-emergency operation under normal conditions. During testing periods, the engine would typically be run for less than one hour under light engine loads. The generator engine would be required to meet EPA emission standards and consume commercially available low sulfur diesel fuel. The emissions from the operation of the generator were calculated using the CalEEMod model.

This diesel engine would be subject to CARB's Stationary Diesel Airborne Toxics Control Measure (ATCM) and require permits from the BAAQMD, since it will be equipped with an engine larger than 50-HP. As part of the BAAQMD permit requirements for toxics screening analysis, the engine emissions will have to meet Best Available Control Technology for Toxics (TBACT) and pass the toxic risk screening level of less than ten in a million. The risk assessment would be prepared by BAAQMD. Depending on results, BAAQMD would set limits for DPM emissions (e.g., more restricted engine operation periods). Sources of air pollutant emissions complying with all applicable BAAQMD regulations generally will not be considered to have a significant air quality community risk impact.

To obtain an estimate of potential cancer risks and $PM_{2.5}$ impacts from operation of the emergency generator, the U.S. EPA AERMOD dispersion model was used to calculate the maximum annual DPM concentration at the off-site MEI location. The same receptor, breathing height, and

[22] 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

BAAQMD Moffett Federal Airfield meteorological data used in the construction dispersion modeling were used for the generator model. Stack parameters (stack height, exhaust flow rate, and exhaust gas temperature) for modeling the generators were based on BAAQMD default parameters for emergency diesel generators since project-specific information is not available.[23] Annual average DPM and $PM_{2.5}$ concentrations were modeled assuming that generator and fire pump testing could occur at any time of the day (24 hours per day, 365 days per year).

To calculate the increased cancer risk from the generator at the MEI, the cancer risks exposure duration was adjusted to account for the residential MEI being exposed to construction for the first two years of the 30-year lifetime period. The exposure duration for the generators was adjusted for 28 years. Table 6 lists the community risks from emergency diesel generator at the location of residential MEI. The emissions and health risk calculations for the proposed generators are included in *Attachment 4*.

Summary of Project-Related Community Risks at the Off-Site Project MEI

The cumulative risk impacts from a project is the combination of construction and operation sources. These sources include on-site construction activity and the project generator. The project impact is computed by adding the construction cancer risk for an infant to the increased cancer risk for the project operational conditions for the generator at the MEI over a 30-year period. The project MEI is identified as the sensitive receptor that is most impacted by the project's construction and operation.

For this project, the sensitive receptor identified in Figure 1 as the construction MEI is also the project MEI. At this location, the MEI would be exposed to two years of construction cancer risks and 28 years of operational (i.e., emergency backup generator) cancer risks. The cancer risks from construction and operation of the project were summed together. Unlike the increased maximum cancer risk, the annual $PM_{2.5}$ concentration and HI risks are not additive but based on an annual maximum risk for the entirety of the project.

As shown in Table 6, the unmitigated maximum increased cancer risks, maximum $PM_{2.5}$ concentration, and health hazard indexes from construction and operation activities at the project MEI do not exceed their respective BAAQMD single-source thresholds of greater than 10.0 per million for cancer risk, greater than 0.3 $\mu g/m^3$ for $PM_{2.5}$ concentration and greater than 1.0 for HI. *Attachment 4* to this report includes the emission calculations used for the construction modeling and the cancer risk calculations.

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[23] Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department, 2012. *The San Francisco Community Risk Reduction Plan: Technical Support Document,* BAAQMD, December. Web: https://www.gsweventcenter.com/Appeal_Response_References/2012_1201_BAAQMD.pdf

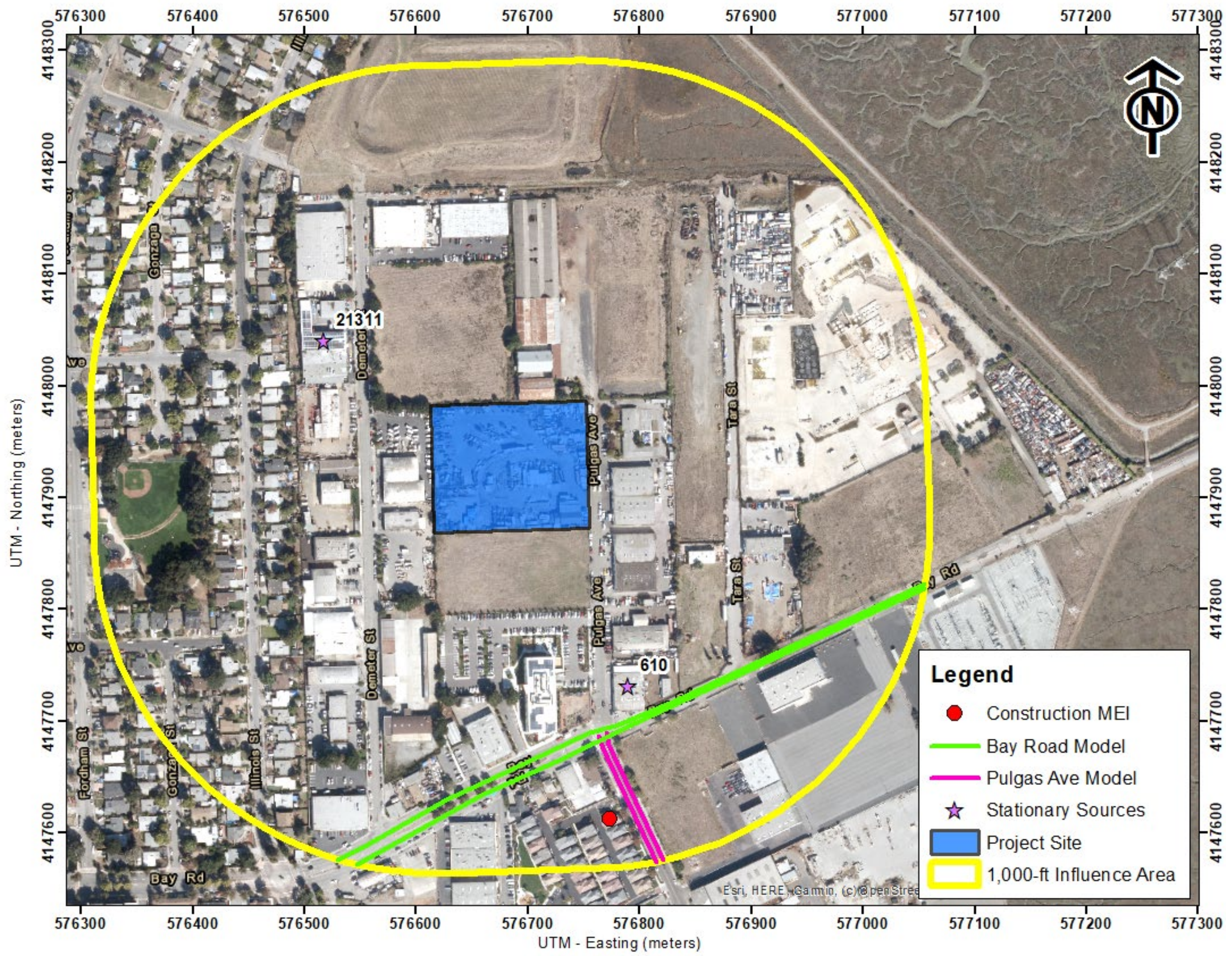
Table 6. Construction and Operation Risk Impacts at the Offsite Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Construction (Years 0-2)	Unmitigated	6.20 (infant)	0.04	<0.01
Project Generators (Years 2-30)		0.03 (child)	<0.01	<0.01
Unmitigated Total/Maximum Project (Years 0-30)		6.23	0.04	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Most Affected Nearby Child – EPA Center Arts Child Receptor				
Project Construction (Years 0-2)	Unmitigated	3.22 (child)	0.03	<0.01
Project Generators (Years 2-9)		0.04 (child)	<0.01	<0.01
Unmitigated Total/Maximum Project (Years 0-9)		3.26	0.03	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

Cumulative Community Risks of all TAC Sources at the Off-Site 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 freeways or highways, rail lines, busy surface streets, and stationary sources identified by BAAQMD. A review of the project influence area indicates that traffic on Bay Road and Pulgas Avenue would exceed an average daily traffic (ADT) of 10,000 vehicles. Other nearby streets are assumed to have less than 10,000 vehicles per day. A review of BAAQMD's stationary source map website identified three stationary sources with the potential to affect the project MEI. Figure 2 shows the location of the sources affecting the MEI. Community risk impacts from these sources upon the MEI reported in Table 7. 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



<u>Local Roadways – Bay Road and Pulgas Avenue</u>

Bay Road and Pulgas Avenue are located near the project site and project MEI. Traffic on Bay Road and Pulgas Avenue is a source of TACs that could adversely affect sensitive receptors at the project site and MEIs. This assessment was conducted following guidance provided by the BAAQMD and OEHHA to analyze potential community health risk impacts at the project site and MEIs from nearby sources of TAC emissions.

Potential community risk impacts from Bay Road and Pulgas Avenue traffic TAC emissions to sensitive receptors at the project site and MEI were evaluated. This analysis involved the development of DPM, total organic gases (TOG), and $PM_{2.5}$ emissions for project traffic on Bay Road and Pulgas Avenue and using these emissions with an air quality dispersion model to calculate TAC and $PM_{2.5}$ concentrations at project site and MEI receptor locations. Increased cancer risks, non-cancer health effects represented by the HI, and the increase in annual $PM_{2.5}$ concentrations were then computed using the modeled TAC and $PM_{2.5}$ concentrations and BAAQMD methods and exposure parameters described in *Attachment 1*.

Busy roadways are a source of TAC emissions that could affect new sensitive receptors at the project site and at the MEI. Bay Road and Pulgas Avenue are busy arterial roadways near the project site and MEI. In the vicinity of the project site, using cumulative plus project traffic volumes provided by the project's traffic engineer,[24] the ADT on Bay Road was estimated to be 22,606 vehicles and the ADT on Pulgas Avenue was estimated to be 15,372 vehicles. Because these traffic volumes are greater than an ADT of 10,000, a refined analysis of Bay Road and Pulgas Avenue to assess potential impacts to the sensitive receptors at the project site and MEI was conducted.

Traffic Emissions

DPM, TOG, and $PM_{2.5}$ emissions from traffic on Bay Road and Pulgas Avenue in the project site and MEI areas were calculated using the CT-EMFAC2017 model, a Caltrans version of CARB's EMFAC2017 emissions model, and local roadway traffic volumes. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM.

Emission processes modeled with CT-EMFAC2017 include running exhaust for DPM, $PM_{2.5}$ and TOG, running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (i.e., San Mateo County), type of road (major/collector), truck percentages (BAAQMD truck percentages for non-state highways in San Mateo County[25]), and traffic mix assigned by CT-EMFAC2017 for the county. Average hourly traffic distributions for San Mateo County roadways were developed using the EMFAC model,[26] which were then applied to Bay Road and Pulgas Avenue traffic volumes to obtain estimated hourly traffic volumes and emissions. An average travel speed of 25 mph for Bay Road and Pulgas Avenue were used for all for all hours of the day based on posted speed limits.

In order to estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating the increased cancer risks for the residential sensitive receptors at the project site and residential MEI from traffic on Bay Road and Pulgas Avenue, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2021 (project construction start year). Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CT-EMFAC2017. Year 2021 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years for residential MEI, 3 years for on-site daycare) since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future.

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[24] Hexagon Transportation Consultants, Inc., *2519 & 2535 Pulgas Avenue Office Development*, December 6, 2019.

[25] 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

[26] The Burden output from EMFAC2007, a prior version of CARB's EMFAC model, was used for this since the current web-based version of EMFAC2014 does not include Burden type output with hour by hour traffic volume information.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the EPA AERMOD air quality dispersion model, which is recommended by the BAAQMD for this type of analysis.[27] TAC and $PM_{2.5}$ emissions from traffic on Bay Road and Pulgas Avenue within about 1,000 feet of the project site were evaluated. Vehicle traffic on the roadways was modeled using a series of adjacent volume sources along a line (line volume sources); with line segments used for each of the travel directions on Bay Road and Pulgas Avenue. A 5-year data set (2013-2017) of hourly meteorological data from the Moffett Field Airport was used for the modeling. Other inputs to the model included road geometries and elevations, hourly traffic emissions, and receptor locations. Annual TAC and $PM_{2.5}$ concentrations for 2021 from traffic on Bay Road and Pulgas Avenue were calculated using the model. Concentrations were calculated at the residential MEI with receptor heights of 5 feet (1.5 meters) to represent the breathing heights of the first floor of the home.

The roadway traffic contributions to cancer risk, annual $PM_{2.5}$ concentrations, and HI are shown in Table 7 for the residential MEI. Details of the emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5*.

<u>BAAQMD Permitted Stationary Sources</u>

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website,[28] which identifies the location of nearby stationary sources and their estimated risk and hazard impacts, including emissions and adjustments to account for new OEHHA guidance. Three sources were identified using this tool with two sources being spray booths and one being a generator. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided updated emissions data and risk values.[29] After further review, one source (#1434) is part of the existing project site and would be removed.

The screening level risks and hazards provided by BAAQMD for the stationary sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines and Generic Equipment*. Community risk impacts from the stationary sources upon the MEIs are reported in Table 7.

<u>Construction Risk Impacts from Nearby Developments</u>

Within the 1,000-ft influence area, there are new developments identified by the City that could be constructed or are planned for possible construction around the time as the proposed project. These developments include the Sobrato Center for Community Services (2519 Pulgas Ave) office project, EPA Center Arts (1950 Bay Road) project, 1804 Runnymede residential project, 965 Weeks residential project, 2020 Bay Road mixed-use project, EPA Waterfront mixed-use project, Harvest Properties mixed-use project, and Four Corners (1675 Bay Road) mixed-use project.

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[27] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

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

[29] Correspondence with Areana Flores, MSc, Environmental Planner, BAAQMD, February 9, 2021.

The EPA Center Arts project has already completed construction, and therefore, was not included in the cumulative risk assessment. The 1804 Runnymede and 965 Weeks residential projects are outside the project's 1,000-foot influence area and therefore their construction risks would not have an impact on this project's cumulative risk assessment. The 2020 Bay Road, EPA Waterfront, Harvest Properties, and Four Corners mixed-use projects are not allowed to proceed until after the approval of the Ravenswood/4 Corners Specific Plan Update and will likely not overlap with construction of the proposed project. Therefore, their construction risks were not included in the cumulative risk assessment.

The only nearby project identified by the City likely to be construction at the same time as the proposed project within the project's 1,000-foot influence area is the Sobrato Center for Community Services office project. The Sobrato Center for Community Services did not have available construction impact results at the time of this study, therefore, it was assumed the construction risks from this development would be less than the BAAQMD single-source thresholds for community risks and hazards This approach likely provides an overestimate of the community risk and hazard levels because it assumes that maximum impacts from this development occur concurrently with the proposed project.

Summary of Cumulative Risks at the Project MEI

Table 7 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e., the MEI). Without mitigation, the project's community risk from project construction activities would not exceed the single-source maximum increased cancer risk, $PM_{2.5}$ concentration, or HI thresholds. In addition, the combined unmitigated cancer risk, $PM_{2.5}$ concentration, and HI values would not exceed their respective cumulative thresholds.

Table 7. Cumulative Community Risk Impacts from Combined TAC Sources at MEI

Source	**Maximum Cancer Risk (per million)**	**$PM_{2.5}$ concentration ($\mu g/m^3$)**	**Hazard Index**
Project Impacts			
Unmitigated Total/Maximum Project (Years 0-30)	6.23 (infant)	0.04	<0.01
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Exceed Threshold? Unmitigated	*No*	*No*	*No*
Cumulative Impacts			
Bay Road, 22,606 ADT	5.21 (infant)	0.21	<0.01
Pulgas Avenue, 15,372 ADT	4.06 (infant)	0.18	<0.01
West Bay Sanitary District (Facility ID #21311, Generators), MEI +1,000 feet	0.02	--	--
Cal Spray Inc. (Facility ID #610, Spray booth & abrasives blasting) MEI 300 feet	--	<0.01	<0.01
Sobrato Center for Community Services Mitigated Construction Emissions – MEI 600 feet south	<10.0	<0.3	<1.0
Combined Sources Unmitigated	25.52 (infant)	<0.74	<1.05
BAAQMD Cumulative Source Threshold	*>100*	*>0.8*	*>10.0*
Exceed Threshold? Unmitigated	*No*	*No*	*No*

Non-CEQA: On-Site Community Risk Assessment for TAC Sources - New Project Daycare

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 (child daycare) that that project would introduce. The same TAC sources identified above were used in this health risk assessment.[30]

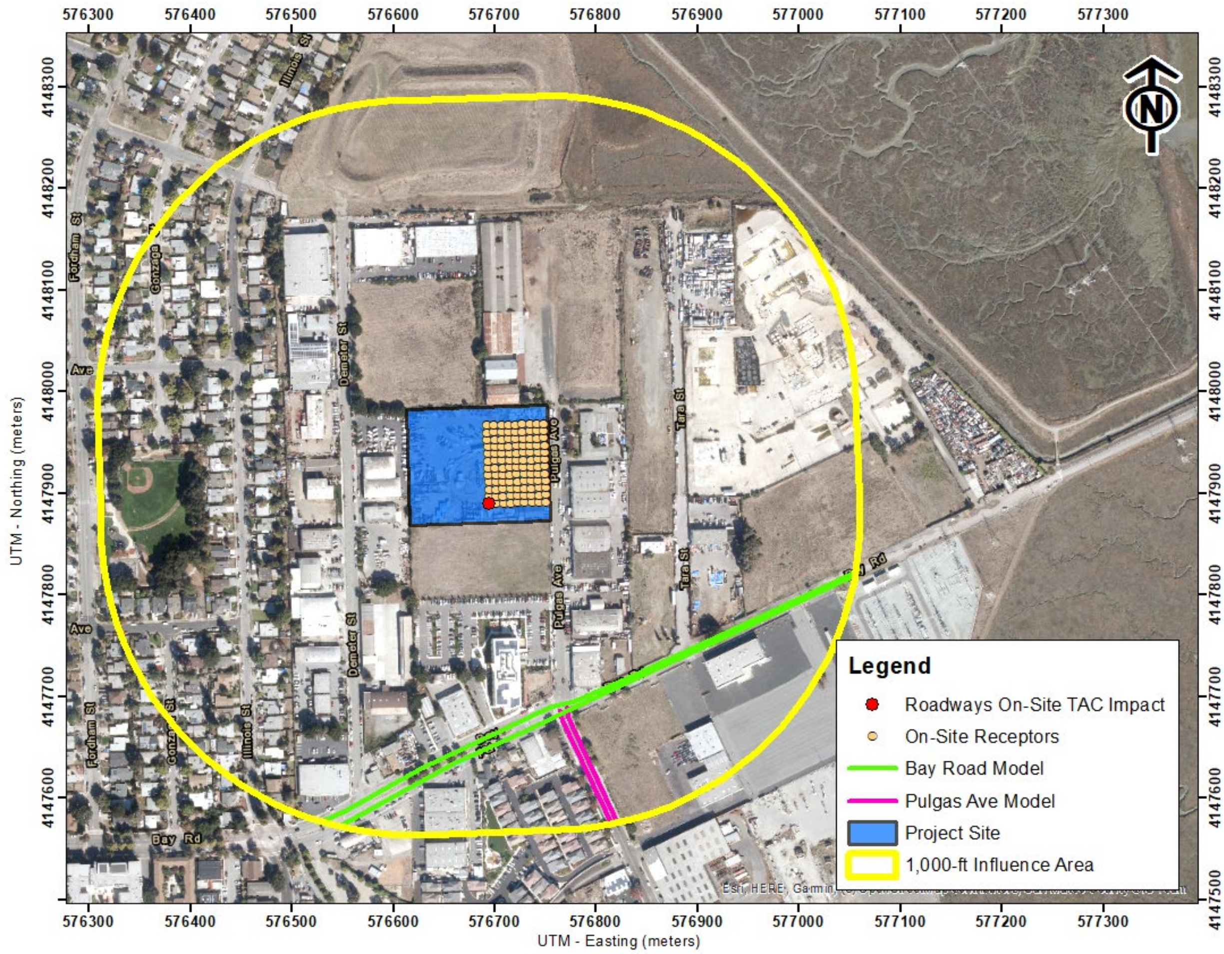
Local Roadways – Bay Road and Pulgas Avenue

The roadway analysis for the project daycare with children was conducted in the same manner as described above for the off-site MEI. The project set of receptors were placed on the proposed building location and were spaced every 23 feet (7 meters). Roadway impacts were modeled at receptor heights of 3 feet (1 meter) representing child sensitive receptors on the first floor in the daycare. The portions of Bay Road and Pulgas Avenue included in the modeling are shown in Figure 3 along with the project site and receptor locations where impacts were modeled.

Maximum increased cancer risks were calculated at the project site using the maximum modeled TAC concentrations. A 3-year child daycare exposure period was used in calculating cancer risks assuming the children (3-5 years old) in the new daycare area would be there for 9 hours per day for 250 days per year. The highest impacts from Bay Road occurred at the receptor closest to Bay Road on the southeastern side of the site. The highest impacts from Pulgas Avenue occurred at the southwestern corner of the site. Cancer risks associated with Bay Road and Pulgas Avenue are greatest closest to Bay Road and Pulgas Avenue and decrease with distance from the roads. The roadways' community risk impacts at the project site are shown in Table 8. Details of the emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5.*

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

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



<u>BAAQMD Permitted Stationary Sources</u>

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the project MEI. Table 8 shows the health risk results from the stationary sources.

<u>Construction Risk Impacts from Nearby Developments</u>

The construction risk impacts from nearby developments review for the new project sensitive receptors was conducted in the same manner as described above for the project MEI, assuming this project would be operational while the nearby development is still being constructed. Table 8 shows the construction health risk results from the nearby development.

<u>Cumulative Community Health Risk at Project Site</u>

Community risk impacts from the existing TAC sources and future nearby developments upon the project site are reported in Table 8. The risks from the singular TAC sources are compared against the BAAQMD single-source threshold. The risks from all the sources are then combined and compared against the BAAQMD cumulative-source threshold. As shown, none of the sources exceed the single-source or cumulative-source thresholds.

Table 8. Impacts from Combined Sources to Project Site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Bay Road, 22,606 ADT	0.22 (child)	0.03	<0.01
Pulgas Avenue, 15,372 ADT	0.03 (child)	<0.01	<0.01
West Bay Sanitary District (Facility ID #21311, generators), Project Site 200 feet	0.25	--	--
Cal Spray Inc (Facility ID #610, Spray booth & abrasives blasting), Project Site 400 feet	--	<0.01	<0.01
Sobrato Center for Community Services Mitigated Construction Emissions – Project Site 5 feet north	<10.0	<0.3	<1.0
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	*No*	*No*	*No*
Cumulative Total	<10.50	<0.35	<1.03
BAAQMD Cumulative Source Threshold	***>100***	***>0.8***	***>10.0***
Exceed Threshold?	*No*	*No*	*No*

GREENHOUSE GAS EMISSIONS

Setting

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2, CH_4, and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.
- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO_2 equivalents (CO_2e).

An expanding body of scientific research supports the theory that global climate change is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

Recent Regulatory Actions for GHG Emissions

Executive Order S-3-05 – California GHG Reduction Targets

Executive Order (EO) S-3-05 was signed by Governor Arnold Schwarzenegger in 2005 to set GHG emission reduction targets for California. The three targets established by this EO are as follows: (1) reduce California's GHG emissions to 2000 levels by 2010, (2) reduce California's GHG emissions to 1990 levels by 2020, and (3) reduce California's GHG emissions by 80 percent below 1990 levels by 2050.

Assembly Bill 32 – California Global Warming Solutions Act (2006)

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05, which has a target of reducing GHG emissions 80 percent below 1990 levels.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO_2e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, in light of the economic downturn, to 545 MMT of CO_2e. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO_2e. Thus, an estimated reduction of 80 MMT of CO_2e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

Executive Order B-30-15 & Senate Bill 32 GHG Reduction Targets – 2030 GHG Reduction Target

In April 2015, Governor Brown signed EO B-30-15, which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed Senate Bill (SB) 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017 Climate Change Scoping Plan*. [31] While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB 197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even

[31] California Air Resource Board, 2017. *California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Targets.* November. Web: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf

deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State's emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings;
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities;
- Greatly increase the number of electric vehicles on the road and reduce oil demand in half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce "super pollutants" by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons (MT) CO_2e per capita (statewide) by 2030 and no more than 2 metric tons CO_2e per capita by 2050. The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

Executive Order B-55-18 – Carbon Neutrality

In 2018, a new statewide goal was established to achieve carbon neutrality as soon as possible, but no later than 2045, and to maintain net negative emissions thereafter. CARB and other relevant state agencies are tasked with establishing sequestration targets and create policies/programs that would meet this goal.

Senate Bill 375 – California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

Senate Bill 350 - Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

Senate Bill 100 – Current Renewable Portfolio Standards

In September 2018, SB 100 was signed by Governor Brown to revise California's RPS program goals, furthering California's focus on using renewable energy and carbon-free power sources for its energy needs. The bill would require all California utilities to supply a specific percentage of their retail sales from renewable resources by certain target years. By December 31, 2024, 44 percent of the retails sales would need to be from renewable energy sources, by December 31, 2026 the target would be 40 percent, by December 31, 2017 the target would be 52 percent, and by December 31, 2030 the target would be 60 percent. By December 31, 2045, all California utilities would be required to supply retail electricity that is 100 percent carbon-free and sourced from eligible renewable energy resource to all California end-use customers.

California Building Standards Code – Title 24 Part 11 & Part 6

The California Green Building Standards Code (CALGreen Code) is part of the California Building Standards Code under Title 24, Part 11.[32] The CALGreen Code encourages sustainable construction standards that involve planning/design, energy efficiency, water efficiency resource efficiency, and environmental quality. These green building standard codes are mandatory statewide and are applicable to residential and non-residential developments. The most recent CALGreen Code (2019 California Building Standard Code) was effective as of January 1, 2020.

The California Building Energy Efficiency Standards (California Energy Code) is under Title 24, Part 6 and is overseen by the California Energy Commission (CEC). This code includes design requirements to conserve energy in new residential and non-residential developments, while being cost effective for homeowners. This Energy Code is enforced and verified by cities during the planning and building permit process. The current energy efficiency standards (2019 Energy Code) replaced the 2016 Energy Code as of January 1,2020. Under the 2019 standards, single-family homes are predicted to be 53 percent more efficient than homes built under the 2016 standard due more stringent energy-efficiency standards and mandatory installation of solar photovoltaic

[32] See: https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#:~:text=CALGreen%20is%20the%20first%2Din,to%201990%20levels%20by%202020.

systems. For nonresidential developments, it is predicted that these buildings will use 30 percent less energy due to lightening upgrades.[33]

Federal and Statewide GHG Emissions

The U.S. EPA reported that in 2018, total gross nationwide GHG emissions were 6,676.6 million metric tons (MMT) carbon dioxide equivalent (CO_2e).[34] These emissions were lower than peak levels of 7,416 MMT that were emitted in 2007. CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2017 emissions.[35] In 2017, GHG emissions from statewide emitting activities were 424 MMT. The 2017 emissions have decreased by 14 percent since peak levels in 2004 and are 7 MMT below the 1990 emissions level and the State's 2020 GHG limit. Per capita GHG emissions in California have dropped from a 2001 peak of 14.1 MT per person to 10.7 MT per person in 2017. The most recent Bay Area emission inventory was computed for the year 2011.[36] The Bay Area GHG emission were 87 MMT. As a point of comparison, statewide emissions were about 444 MMT in 2011

City of East Palo Final Climate Action Plan (CAP)

On December 2011, the City of East Palo Alto adopted the City of East Palo Alto Final Climate Action Plan Twenty-Three Actions to Address Our Changing Climate.[37] The CAP is document that includes goals and actions that the City of East Palo Alto can take to reduce their GHG emissions. The City's emission reduction goal is to reduce GHG emissions 15 percent below the baseline 2005 levels by 2020. This CAP is considered a qualified GHG Reduction Strategy. The CAP does not list specific project-level targets or thresholds. However, the following measures from the CAP are applicable to the project.

4.1.1.2 Measures E-1.2.: Establish a green building policy for new commercial construction and major renovation based on CAL Green, LEED, and/or other green building standards

Measure Description: Implementing a green building ordinance, such as CALGreen, LEED, or similar, promotes energy-efficient workplaces that cause fewer GHG emissions. The following Bay Area Climate Collaboratives recommended adoption and implementation pathway for local governments are recommended.

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[33] See: https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf

[34] United States Environmental Protection Agency, 2020. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018*. April. Web: https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf

[35] CARB. 2019. *2019 Edition, California Greenhouse Gas Emission Inventory: 2000 – 2017*. Web: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf

[36] BAAQMD. 2015. *Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011*. January. Web: http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf accessed Nov. 26, 2019.

[37] City of East Palo Alto, 2011. *City of East Palo Alto Final Climate Action Plan Twenty-Three Actions to Address Our Changing Climate*. December. Web: http://www.ci.east-palo-alto.ca.us/documentcenter/view/748

1. Prioritize education and enforcement of the CALGreen mandatory provisions. Allow rating-system documentation as compliance of directly compatible mandatory CALGreen measures.

2. Where a local leadership standard is desired, continue to apply the LEED rating systems. File an application to the CEC and submit findings to the California Building Standards Commission as appropriate and required by law for any ordinance that includes standards in excess of California's building- and energy-code baselines.

3. Should a local government adopt a CALGreen Tier, also accept third-party certified LEED or GreenPoint Rated requirements in lieu of the Tier requirements. In other words, green building certification at a given level should be accepted as fulfilling local green building requirements above and beyond the CALGreen mandatory measures.

4.2.1.2 Measures TL-1.2: Continue to implement Ravenswood/4 Corners TOD Strategy

Measure Description: Transit-oriented developments (TOD) seek to build residences, commercial spaces, including offices and retail, and parks that facilitate transit use. TODs can be very beneficial to a community in that they can provide a myriad of transportation benefits that improve mobility, increase public safety, reduce VMTs, reduce air pollution, and conserve open spaces

The City's CAP does not have a specific metric ton GHG threshold for project-level construction or operation. Therefore, the BAAQMD's CEQA Air Quality Guideline's thresholds are used.

<u>BAAQMD GHG Significance Thresholds</u>

The BAAQMD's CEQA Air Quality Guidelines do not use quantified thresholds for projects that are in a jurisdiction with a qualified GHG reductions plan (i.e., a Climate Action Plan). The plan has to address emissions associated with the period that the project would operate (e.g., beyond year 2020). For quantified emissions, the guidelines recommended a GHG threshold of 1,100 metric tons or 4.6 metric tons (MT) per capita. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur beyond 2020, so a threshold that addresses a future target is appropriate.

Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO_2e/year/service population and a bright-line threshold of 660 MT CO_{2e}/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on the 1990 inventory and the projected 2030 statewide population and employment levels. [38] The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold. Evidence published by the State indicates the AB 32 goal of reducing statewide GHG emissions to 1990 levels was met prior to 2020. Current State plans are to further reduce emissions to 40% below 1990 levels by 2030. Assuming statewide

[38] Bay Area Air Quality Management District, 2016. *CLE International 12th Annual Super-Conference CEQA Guidelines, Case Law and Policy Update*. December.

emissions are at 1990 levels or lower in 2020, it would be logical to reduce the BAAQMD-recommended threshold for meeting the AB 32 threshold by 40% to develop a threshold for 2030.

Impact: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

GHG emissions associated with development of the proposed project would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with operating of the generator. Emissions for the proposed project are discussed below and were analyzed using the methodology recommended in the BAAQMD CEQA Air Quality Guidelines.

<u>CalEEMod Modeling</u>

CalEEMod was used to predict GHG emissions from operation of the site assuming full build-out of the project. The project land use types and size and other project-specific information were input to the model, as described above within the operational period emissions. CalEEMod output is included in *Attachment 2*.

<u>Service Population Emissions</u>

The project service population efficiency rate is based on the number of future full-time employees/adult students. Based on information provided by the project applicant, there would be a total of 440 full-time employees/adult students. This employee count was used to calculate the per capita emissions.

<u>Construction Emissions</u>

GHG emissions associated with construction were computed to be 508 MT of CO_2e for the total construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable.

<u>Operational Emissions</u>

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate daily emissions associated with operation of the fully-developed site under the proposed project. As shown in Table 9, the net annual emissions resulting from operation of the proposed project are predicted to be 914 MT of CO_2e in 2023 and 848 MT of CO_2e in 2030. The service population emission for the year 2023 and 2030 are predicted to be 2.55 and 2.35 MT/CO_{2e}/year/service population, respectively.

To be considered an exceedance of the threshold, the project emissions must exceed both the GHG significance threshold in metric tons per year and the service population significance threshold in the future year of 2030. As shown in Table 9, the project would not exceed the per service population threshold of 2.8 MT of CO_2e/year/service population in 2030 but would exceed the annual emissions bright-line threshold of 660 MT CO_2e/year in 2030. Therefore, the project would not be in exceedance for GHG emissions.

Table 9. Annual Project GHG Emissions (CO_2e) in Metric Tons and Per Capita

Source Category	Existing Land Use		Proposed Project	
	2023	**2030**	**2023**	**2030**
Area	0	0	0	0
Energy Consumption	16	16	266	266
Mobile	185	165	799	714
Solid Waste Generation	3	3	44	44
Water Usage	3	3	11	11
Total (MT CO_{2e}/year)	207	187	1,120	1,035
Net Emissions			**914 MT CO_{2e}/year**	**848 MT CO_{2e}/year**
Significance Threshold				***660 MT CO_2e/year***
Service Population Emissions (MT CO_{2e}/year/service population)			2.55	2.35
Significance Threshold				***2.8 in 2030***
Exceeds both thresholds?				*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 and operational criteria air pollutant and GHG emissions. The operational outputs for existing and 2030 uses are also included in this attachment. 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. 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 project site and project MEI.

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.[39] 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.[40] 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.[41] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

<u>Cancer Risk</u>

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). However, CARB and the BAAQMD recommend the use of a residential exposure duration of 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.

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

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[39] 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.
[40] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[41] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

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 for moderate intensity.

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

* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.

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*

* Exposure Frequency can change dependent on the type of receptors (i.e. residential, worker, school, daycare). For worker exposures (adult), the exposure duration and frequency are 25 years 250 days/year and FAH is not applicable.

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

Attachment 3: EMFAC2017 Calculations

Attachment 4: Construction and Operation Health Risk Calculations

<u>*Construction Emissions and Health Risk Calculations*</u>

JobTrain, East Palo Alto, 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	Construction	0.0454	CON_DPM	90.8	0.02764	3.48E-03	15781	2.21E-07
2022	Construction	0.0474	CON_DPM	94.8	0.02886	3.64E-03	15781	2.30E-07
Total		***0.0928***		***185.6***	***0.0565***	***0.0071***		

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

JobTrain, East Palo Alto, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2021	Construction	CON_FUG	0.0580	116.0	0.03531	4.45E-03	15,781	2.82E-07
2022	Construction	CON_FUG	0.0007	1.4	0.00043	5.37E-05	15,781	3.40E-09
Total			***0.0587***	***117.4***	***0.0357***	***0.0045***		

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

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021	Construction	0.0145	CON_DPM	29.0	0.00883	1.11E-03	15781	7.05E-08
2022	Construction	0.0406	CON_DPM	81.2	0.02472	3.11E-03	15781	1.97E-07
Total		***0.0551***		***110.2***	***0.0335***	***0.0042***		

Construction Hours

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

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2021	Construction	CON_FUG	0.0258	51.6	0.01571	1.98E-03	15,781	1.25E-07
2022	Construction	CON_FUG	0.0000	0.0	0.00000	0.00E+00	15,781	0.00E+00
Total			***0.0258***	***51.6***	***0.0157***	***0.0020***		

Construction Hours

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

JobTrain, East Palo Alto, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM (μg/m³)	Maximum Concentrations: Fugitive PM2.5 (μg/m³)	Cancer Risk (per million) Infant/Child	Hazard Index (-)	Maximum Annual PM2.5 Concentration (μg/m³)
2021	0.0178	0.0239	3.16	0.004	0.04
2022	0.0185	0.0003	3.04	0.004	0.02
Total	-	-	**6.20**	-	-
Maximum	0.0185	0.0239	**-**	**0.004**	**0.04**

Maximum Impacts at EPA Center Arts

Construction Year	Unmitigated Emissions: Maximum Concentrations: Exhaust PM2.5/DPM (μg/m³)	Maximum Concentrations: Fugitive PM2.5 (μg/m³)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration (μg/m³)
2021	0.0252	0.0331	1.58	0.005	0.06
2022	0.0262	0.0004	1.64	0.005	0.03
Total	-	-	**3.22**	-	-
Maximum	0.0262	0.0331	**-**	**0.005**	**0.06**

JobTrain, East Palo Alto, 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			Infant/Child	Adult - Exposure Information			Adult	Maximum		
	Exposure				Age	Cancer	Modeled		Age	Cancer			
Exposure	Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Hazard	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	Index	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2021	0.0178	10	0.24	2021	0.0178	-	-			
1	1	0 - 1	2021	0.0178	10	2.92	2021	0.0178	1	0.05	0.0036	0.0239	0.0417
2	1	1 - 2	2022	0.0185	10	3.04	2022	0.0185	1	0.05	0.0037	0.0003	0.0188
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						**6.2**				**0.10**			

* Third trimester of pregnancy

JobTrain, East Palo Alto, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at EPA Center Arts (13 years and older) - 1.5 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 (7 days/5 days) = 3.73
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	**Exposure Duration (years)**	**Age**	**Child - Exposure Information** DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	**Age* Sensitivity Factor**	**Child Cancer Risk (per million)**
1	1	13 - 14	2021	0.0252	3	1.6
2	1	14 - 15	2022	0.0262	3	1.6
3	1			0.0000	3	0.0
4	1			0.0000	3	0.0
5	1			0.0000	3	0.0
6	1			0.0000	3	0.0
7	1			0.0000	3	0.0
8	1			0.0000	3	0.0
9	1			0.0000	3	0.0
Total Increased Cancer Risk						**3.22**

* Children assumed to be 13 years of age or older with 2 years of Construction Exposure

	Maximum	
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0050	0.0331	0.0582
0.0052	0.0004	0.0266

Project Emergency Generator Emissions and Health Risk Calculations

JobTrain, E. Palo Alto, CA

Standby Emergency Generator Impacts

Off-site Sensitive Receptors

MEI Location =1.5 meter receptor height

DPM Emission Rates		
	DPM Emissions per Generator	
	Max Daily	Annual
Source Type	(lb/day)	(lb/year)
100-kW, 134-hp Generator	0.004	1.62
CalEEMod DPM Emissions	8.10E-04	tons/year

Modeling Information		
Model	AERMOD	
Source	Diesel Generator Engine	
Source Type	Point	
Meteorological Data	2013-2017 Moffett Federal Airfield Meterological Data	
Point Source Stack Parameters		
Generator Engine Size (hp)	134	
Stack Height (ft)	72.00	roof mechanical enclosure release assumed
Stack Diameter (ft)**	0.60	
Exhaust Gas Flowrate (CFM)*	2527.73	
Stack Exit Velocity (ft/sec)**	149.00	
Exhaust Temperature (˚F)**	872.00	
Emissions Rate (lb/hr)	0.000185	

* AERMOD default

**BAAQMD default generator parameters

JobTrain, E. Palo Alto, CA - Cancer Risks from Project Operation
Project Emergency Generator
Impacts at Off-Site Receptors- 1.5m MEI Receptor Heights
Impact at Project MEI (28-year Exposure)

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

	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

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information: DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2021	0.0000	10	0.000				
1	1	0 - 1	2021	0.0000	10	0.000				
2	1	1 - 2	2022	0.0000	10	0.000				
3	1	2 - 3	2023	0.0001	3	0.002		0.00002	0.0001	0.0002
4	1	3 - 4	2024	0.0001	3	0.002		0.00002	0.0001	0.0002
5	1	4 - 5	2025	0.0001	3	0.002		0.00002	0.0001	0.0002
6	1	5 - 6	2026	0.0001	3	0.002		0.00002	0.0001	0.0002
7	1	6 - 7	2027	0.0001	3	0.002		0.00002	0.0001	0.0002
8	1	7 - 8	2028	0.0001	3	0.002		0.00002	0.0001	0.0002
9	1	8 - 9	2029	0.0001	3	0.002		0.00002	0.0001	0.0002
10	1	9 - 10	2030	0.0001	3	0.002		0.00002	0.0001	0.0002
11	1	10 - 11	2031	0.0001	3	0.002		0.00002	0.0001	0.0002
12	1	11 - 12	2032	0.0001	3	0.002		0.00002	0.0001	0.0002
13	1	12 - 13	2033	0.0001	3	0.002		0.00002	0.0001	0.0002
14	1	13 - 14	2034	0.0001	3	0.002		0.00002	0.0001	0.0002
15	1	14 - 15	2035	0.0001	3	0.002		0.00002	0.0001	0.0002
16	1	15 - 16	2036	0.0001	3	0.002		0.00002	0.0001	0.0002
17	1	16-17	2037	0.0001	1	0.000		0.00002	0.0001	0.0002
18	1	17-18	2038	0.0001	1	0.000		0.00002	0.0001	0.0002
19	1	18-19	2039	0.0001	1	0.000		0.00002	0.0001	0.0002
20	1	19-20	2040	0.0001	1	0.000		0.00002	0.0001	0.0002
21	1	20-21	2041	0.0001	1	0.000		0.00002	0.0001	0.0002
22	1	21-22	2042	0.0001	1	0.000		0.00002	0.0001	0.0002
23	1	22-23	2043	0.0001	1	0.000		0.00002	0.0001	0.0002
24	1	23-24	2044	0.0001	1	0.000		0.00002	0.0001	0.0002
25	1	24-25	2045	0.0001	1	0.000		0.00002	0.0001	0.0002
26	1	25-26	2046	0.0001	1	0.000		0.00002	0.0001	0.0002
27	1	26-27	2047	0.0001	1	0.000		0.00002	0.0001	0.0002
28	1	27-28	2048	0.0001	1	0.000		0.00002	0.0001	0.0002
29	1	28-29	2049	0.0001	1	0.000		0.00002	0.0001	0.0002
30	1	29-30	2050	0.0001	1	0.000		0.00002	0.0001	0.0002
Total Increased Cancer Risk						**0.03**	Max	**0.00002**	**0.0001**	**0.0002**

* Third trimester of pregnancy

JobTrain, E. Palo Alto, CA - Cancer Risks from Project Operation
Project Emergency Generator
Impacts at Off-Site EPA Center Arts Child Exposure- 1.5m MEI Receptor Heights
Impact at Project MEI (7-year Exposure)

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

	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	1200	520	240
A =	1	1	1	1
EF =	250	250	250	250
AT =	70	70	70	70
FAH =	1.00	1.00	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information: DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
1	1	7 - 8	2021	0.0000	3	0.00				
2	1	8 - 9	2022	0.0000	3	0.00				
3	1	9 - 10	2023	0.0001	3	0.01		0.00002	0.0001	0.0002
4	1	10 - 11	2024	0.0001	3	0.01		0.00002	0.0001	0.0002
5	1	11 - 12	2025	0.0001	3	0.01		0.00002	0.0001	0.0002
6	1	12 - 13	2026	0.0001	3	0.01		0.00002	0.0001	0.0002
7	1	13 - 14	2027	0.0001	3	0.01		0.00002	0.0001	0.0002
8	1	14 - 15	2028	0.0001	3	0.01		0.00002	0.0001	0.0002
9	1	15 - 16	2029	0.0001	3	0.01		0.00002	0.0001	0.0002
Total Increased Cancer Risk						**0.04**	Max	**0.00002**	**0.0001**	**0.0002**

* Older children at EPA Center Arts

Attachment 5: Community Risk Screening and Calculations

CT-EMFAC2017 Emissions Factors for Bay Road and Pulgas Avenue

File Name:	JobTrain - San Mateo (SF) - 2021 - Annual.EF
CT-EMFAC2017 Version:	1.0.2.27401
Run Date:	2/10/2021 12:04
Area:	San Mateo (SF)
Analysis Year:	2021
Season:	Annual

===

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.018	0.46	0.54
Truck 2	0.013	0.871	0.114
Non-Truck	0.969	0.016	0.967

===

Road Type:	Major/Collector	
Silt Loading Factor:	CARB	0.032 g/m2
Precipitation Correction:	CARB	P = 60 day: N = 365 days

===

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

Pollutant Name	<= 5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph
PM2.5	0.011611	0.007822	0.005344	0.003815	0.002936	0.002402	0.002075
TOG	0.265499	0.174765	0.116329	0.08138	0.061424	0.048957	0.040957
Diesel PM	0.0025	0.002091	0.001535	0.001145	0.000965	0.000868	0.000817

===

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

Pollutant Name	Emission Factor
TOG	1.313494

===

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

Pollutant Name	Emission Factor
PM2.5	0.002045

===

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

Pollutant Name	Emission Factor
PM2.5	0.016783

===

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

Pollutant Name	Emission Factor
PM2.5	0.014693

============================END=====================================

Bay Road Traffic Emissions and Health Risk Calculations

Traffic Data Year = *2040*

Caltrans AADT (2017) & Truck %s (2018)	AADT Total
Cumlative + Project Bay Rd	22,606

Percent of Total Vehicles

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

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Bay Road
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_EB_BAY	Bay Road Eastbound	EB	2	565.3	0.35	13.3	43.7	3.4	25	11,303
DPM_WB_BAY	Bay Road Westbound	WB	2	582.8	0.36	13.3	43.7	3.4	25	11,303
									Total	22,606

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.00097			

2021 Hourly Traffic Volumes and DPM Emissions - DPM_EB_BAY

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.85%	435	4.10E-05	9	6.57%	742	6.99E-05	17	6.60%	746	7.02E-05
2	3.18%	360	3.39E-05	10	8.24%	932	8.77E-05	18	4.09%	462	4.35E-05
3	2.35%	265	2.50E-05	11	6.06%	685	6.45E-05	19	2.38%	269	2.53E-05
4	1.01%	114	1.07E-05	12	7.24%	818	7.70E-05	20	1.21%	136	1.28E-05
5	1.01%	114	1.07E-05	13	6.73%	761	7.17E-05	21	3.05%	345	3.24E-05
6	2.18%	246	2.32E-05	14	6.57%	742	6.99E-05	22	5.06%	572	5.38E-05
7	4.72%	534	5.03E-05	15	5.90%	666	6.28E-05	23	3.55%	401	3.78E-05
8	3.58%	405	3.81E-05	16	4.22%	477	4.49E-05	24	0.67%	76	7.13E-06
								Total		11,303	

2021 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_WB_BAY

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.85%	435	4.23E-05	9	6.57%	742	7.20E-05	17	6.60%	746	7.24E-05
2	3.18%	360	3.49E-05	10	8.24%	932	9.04E-05	18	4.09%	462	4.48E-05
3	2.35%	265	2.57E-05	11	6.06%	685	6.65E-05	19	2.38%	269	2.61E-05
4	1.01%	114	1.10E-05	12	7.24%	818	7.94E-05	20	1.21%	136	1.32E-05
5	1.01%	114	1.10E-05	13	6.73%	761	7.39E-05	21	3.05%	345	3.34E-05
6	2.18%	246	2.39E-05	14	6.57%	742	7.20E-05	22	5.06%	572	5.55E-05
7	4.72%	534	5.18E-05	15	5.90%	666	6.47E-05	23	3.55%	401	3.90E-05
8	3.58%	405	3.93E-05	16	4.22%	477	4.63E-05	24	0.67%	76	7.35E-06
								Total		11,303	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Bay Road
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM2.5_EB_BAY	Bay Road Eastbound	EB	2	565.3	0.35	13.3	44	1.3	25	11,303
PM2.5_WB_BAY	Bay Road Westbound	WB	2	582.8	0.36	13.3	44	1.3	25	11,303
									Total	22,606

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.002936			

2021 Hourly Traffic Volumes and PM2.5 Emissions - PM2.5_EB_BAY

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	127	3.64E-05	9	7.12%	805	2.30E-04	17	7.43%	840	2.41E-04
2	0.42%	47	1.35E-05	10	4.38%	495	1.42E-04	18	8.23%	931	2.67E-04
3	0.37%	42	1.20E-05	11	4.65%	526	1.51E-04	19	5.72%	647	1.85E-04
4	0.17%	19	5.52E-06	12	5.89%	666	1.91E-04	20	4.31%	487	1.39E-04
5	0.45%	51	1.46E-05	13	6.17%	698	2.00E-04	21	3.25%	367	1.05E-04
6	0.85%	96	2.76E-05	14	6.05%	684	1.96E-04	22	3.31%	374	1.07E-04
7	3.73%	422	1.21E-04	15	7.06%	798	2.29E-04	23	2.48%	280	8.03E-05
8	7.77%	878	2.51E-04	16	7.18%	812	2.33E-04	24	1.87%	211	6.05E-05
								Total		11,303	

2021 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - PM2.5_WB_BAY

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	127	3.75E-05	9	7.12%	805	2.38E-04	17	7.43%	840	2.48E-04
2	0.42%	47	1.39E-05	10	4.38%	495	1.46E-04	18	8.23%	931	2.75E-04
3	0.37%	42	1.24E-05	11	4.65%	526	1.55E-04	19	5.72%	647	1.91E-04
4	0.17%	19	5.70E-06	12	5.89%	666	1.97E-04	20	4.31%	487	1.44E-04
5	0.45%	51	1.50E-05	13	6.17%	698	2.06E-04	21	3.25%	367	1.09E-04
6	0.85%	96	2.85E-05	14	6.05%	684	2.02E-04	22	3.31%	374	1.11E-04
7	3.73%	422	1.25E-04	15	7.06%	798	2.36E-04	23	2.48%	280	8.28E-05
8	7.77%	878	2.59E-04	16	7.18%	812	2.40E-04	24	1.87%	211	6.24E-05
								Total		11,303	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Bay Road
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_EB_BAY	Bay Road Eastbound	EB	2	565.3	0.35	13.3	44	1.3	25	11,303
TEXH_WB_BAY	Bay Road Westbound	WB	2	582.8	0.36	13.3	44	1.3	25	11,303
									Total	22,606

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.06142			

2021 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_EB_BAY

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	127	7.62E-04	9	7.12%	805	4.82E-03	17	7.43%	840	5.04E-03
2	0.42%	47	2.82E-04	10	4.38%	495	2.97E-03	18	8.23%	931	5.58E-03
3	0.37%	42	2.52E-04	11	4.65%	526	3.15E-03	19	5.72%	647	3.88E-03
4	0.17%	19	1.16E-04	12	5.89%	666	3.99E-03	20	4.31%	487	2.92E-03
5	0.45%	51	3.05E-04	13	6.17%	698	4.18E-03	21	3.25%	367	2.20E-03
6	0.85%	96	5.78E-04	14	6.05%	684	4.10E-03	22	3.31%	374	2.24E-03
7	3.73%	422	2.53E-03	15	7.06%	798	4.78E-03	23	2.48%	280	1.68E-03
8	7.77%	878	5.26E-03	16	7.18%	812	4.87E-03	24	1.87%	211	1.27E-03
								Total		11,303	

2021 Hourly Traffic Volumes Per Direction and TOG Exhaust Emissions - TEXH_WB_BAY

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	127	7.85E-04	9	7.12%	805	4.97E-03	17	7.43%	840	5.19E-03
2	0.42%	47	2.90E-04	10	4.38%	495	3.06E-03	18	8.23%	931	5.75E-03
3	0.37%	42	2.60E-04	11	4.65%	526	3.25E-03	19	5.72%	647	4.00E-03
4	0.17%	19	1.19E-04	12	5.89%	666	4.12E-03	20	4.31%	487	3.01E-03
5	0.45%	51	3.15E-04	13	6.17%	698	4.31E-03	21	3.25%	367	2.27E-03
6	0.85%	96	5.96E-04	14	6.05%	684	4.23E-03	22	3.31%	374	2.31E-03
7	3.73%	422	2.61E-03	15	7.06%	798	4.93E-03	23	2.48%	280	1.73E-03
8	7.77%	878	5.42E-03	16	7.18%	812	5.02E-03	24	1.87%	211	1.30E-03
								Total		11,303	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Bay Road
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_EB_BAY	Bay Road Eastbound	EB	2	565.3	0.35	13.3	44	1.3	25	11,303
TEVAP_WB_BAY	Bay Road Westbound	WB	2	582.8	0.36	13.3	44	1.3	25	11,303
									Total	22,606

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle per Hour (g/hour)	1.31349			
Emissions per Vehicle per Mile (g/VMT)	0.05254			

2021 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_EB_BAY

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	127	6.52E-04	9	7.12%	805	4.12E-03	17	7.43%	840	4.31E-03
2	0.42%	47	2.41E-04	10	4.38%	495	2.54E-03	18	8.23%	931	4.77E-03
3	0.37%	42	2.15E-04	11	4.65%	526	2.69E-03	19	5.72%	647	3.32E-03
4	0.17%	19	9.89E-05	12	5.89%	666	3.41E-03	20	4.31%	487	2.49E-03
5	0.45%	51	2.61E-04	13	6.17%	698	3.58E-03	21	3.25%	367	1.88E-03
6	0.85%	96	4.94E-04	14	6.05%	684	3.51E-03	22	3.31%	374	1.92E-03
7	3.73%	422	2.16E-03	15	7.06%	798	4.09E-03	23	2.48%	280	1.44E-03
8	7.77%	878	4.50E-03	16	7.18%	812	4.16E-03	24	1.87%	211	1.08E-03
								Total		11,303	

2021 Hourly Traffic Volumes Per Direction and TOG Evaporative Emissions - TEVAP_WB_BAY

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	127	6.72E-04	9	7.12%	805	4.25E-03	17	7.43%	840	4.44E-03
2	0.42%	47	2.48E-04	10	4.38%	495	2.62E-03	18	8.23%	931	4.92E-03
3	0.37%	42	2.22E-04	11	4.65%	526	2.78E-03	19	5.72%	647	3.42E-03
4	0.17%	19	1.02E-04	12	5.89%	666	3.52E-03	20	4.31%	487	2.57E-03
5	0.45%	51	2.69E-04	13	6.17%	698	3.69E-03	21	3.25%	367	1.94E-03
6	0.85%	96	5.10E-04	14	6.05%	684	3.61E-03	22	3.31%	374	1.98E-03
7	3.73%	422	2.23E-03	15	7.06%	798	4.22E-03	23	2.48%	280	1.48E-03
8	7.77%	878	4.64E-03	16	7.18%	812	4.29E-03	24	1.87%	211	1.12E-03
								Total		11,303	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Bay Road
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_EB_BAY	Bay Road Eastbound	EB	2	565.3	0.35	13.3	44	1.3	25	11,303
FUG_WB_BAY	Bay Road Westbound	WB	2	582.8	0.36	13.3	44	1.3	25	11,303
									Total	22,606

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00205			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01678			
Road Dust - Emissions per Vehicle (g/VMT)	0.01469			
Total Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.03352			

2021 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_EB_BAY

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	127	4.16E-04	9	7.12%	805	2.63E-03	17	7.43%	840	2.75E-03
2	0.42%	47	1.54E-04	10	4.38%	495	1.62E-03	18	8.23%	931	3.04E-03
3	0.37%	42	1.37E-04	11	4.65%	526	1.72E-03	19	5.72%	647	2.12E-03
4	0.17%	19	6.31E-05	12	5.89%	666	2.18E-03	20	4.31%	487	1.59E-03
5	0.45%	51	1.67E-04	13	6.17%	698	2.28E-03	21	3.25%	367	1.20E-03
6	0.85%	96	3.15E-04	14	6.05%	684	2.24E-03	22	3.31%	374	1.22E-03
7	3.73%	422	1.38E-03	15	7.06%	798	2.61E-03	23	2.48%	280	9.17E-04
8	7.77%	878	2.87E-03	16	7.18%	812	2.66E-03	24	1.87%	211	6.91E-04
								Total		11,303	

2021 Hourly Traffic Volumes Per Direction and Fugitive PM2.5 Emissions - FUG_WB_BAY

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	127	4.29E-04	9	7.12%	805	2.71E-03	17	7.43%	840	2.83E-03
2	0.42%	47	1.58E-04	10	4.38%	495	1.67E-03	18	8.23%	931	3.14E-03
3	0.37%	42	1.42E-04	11	4.65%	526	1.77E-03	19	5.72%	647	2.18E-03
4	0.17%	19	6.50E-05	12	5.89%	666	2.25E-03	20	4.31%	487	1.64E-03
5	0.45%	51	1.72E-04	13	6.17%	698	2.35E-03	21	3.25%	367	1.24E-03
6	0.85%	96	3.25E-04	14	6.05%	684	2.31E-03	22	3.31%	374	1.26E-03
7	3.73%	422	1.42E-03	15	7.06%	798	2.69E-03	23	2.48%	280	9.45E-04
8	7.77%	878	2.96E-03	16	7.18%	812	2.74E-03	24	1.87%	211	7.12E-04
								Total		11,303	

JobTrain, East Palo Alto, CA - Bay Road Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Construction Residential MEI Receptor (1.5 meter receptor height)

Emission Year	2021
Receptor Information	Construction Residential MEI receptor
Number of Receptors	1
Receptor Height	1.5 meters
Receptor Distances	At Construction Residential MEI location
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological	Concentration (µg/m3)*		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0049	0.3582	0.3063

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological	PM2.5 Concentration (µg/m3)*		
Data Years	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.2128	0.1957	0.0171

JobTrain, East Palo Alto, CA - Bay Road Traffic Cancer Risk
Impacts at Construction Residential MEI - 1.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL
0	0.25	-0.25 - 0*	2021	10	0.0049	0.3582	0.3063	0.066	0.028	0.0014	0.10
1	1	0 - 1	2021	10	0.0049	0.3582	0.3063	0.797	0.336	0.0169	1.15
2	1	1 - 2	2022	10	0.0049	0.3582	0.3063	0.797	0.336	0.0169	1.15
3	1	2 - 3	2023	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
4	1	3 - 4	2024	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
5	1	4 - 5	2025	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
6	1	5 - 6	2026	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
7	1	6 - 7	2027	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
8	1	7 - 8	2028	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
9	1	8 - 9	2029	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
10	1	9 - 10	2030	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
11	1	10 - 11	2031	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
12	1	11 - 12	2032	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
13	1	12 - 13	2033	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
14	1	13 - 14	2034	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
15	1	14 - 15	2035	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
16	1	15 - 16	2036	3	0.0049	0.3582	0.3063	0.125	0.053	0.0027	0.18
17	1	16-17	2037	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
18	1	17-18	2038	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
19	1	18-19	2039	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
20	1	19-20	2040	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
21	1	20-21	2041	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
22	1	21-22	2042	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
23	1	22-23	2043	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
24	1	23-24	2044	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
25	1	24-25	2045	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
26	1	25-26	2046	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
27	1	26-27	2047	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
28	1	27-28	2048	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
29	1	28-29	2049	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
30	1	29-30	2050	1	0.0049	0.3582	0.3063	0.014	0.006	0.0003	0.02
Total Increased Cancer Risk								3.61	1.522	0.077	**5.2**

* Third trimester of pregnancy

Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.0010	0.20	0.21

JobTrain, East Palo Alto, CA - Bay Road Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site 1st Floor Daycare Child (3-5 years old) Receptors (1 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	108
Receptor Height	1 meter
Receptor Distances	7 meter grid spacing
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological	Concentration (μg/m3)*		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0009	0.0488	0.0417

Construction School MEI PM2.5 Maximum Concentrations

Meteorological	PM2.5 Concentration (μg/m3)*		
Data Years	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0290	0.0267	0.0023

JobTrain, East Palo Alto, CA - Bay Road Traffic Cancer Risk
Impacts at On-Site 1st Floor Daycare Child Receptors - 1 meter receptor height
3 Year Daycare Child (3-5 years old) Exposure

Cancer Risk Calculation Method

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

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

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

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

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

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
8-Hr BR* =	361	1200	520	240
A =	1	1	1	1
EF =	250	250	250	250
AT =	70	70	70	70
FAH =	1.00	1.00	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)						
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL	Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
1	1	3 - 4	2021	3	0.0009	0.0488	0.0417	0.056	0.017	0.0009	0.07	0.0002	0.03	0.03
2	1	4 - 5	2022	3	0.0009	0.0488	0.0417	0.056	0.017	0.0009	0.07			
3	1	5 - 6	2023	3	0.0009	0.0488	0.0417	0.056	0.017	0.0009	0.07			
Total Increased Cancer Risk								0.17	0.052	0.003	**0.22**			

* Children assumed to be 3-5 years old with 3 years of Exposure

Pulgas Avenue Traffic Emissions and Health Risk Calculations

Traffic Data Year = ***2040***

Caltrans AADT (2017) & Truck %s (2018)	AADT Total
Cumlative + Project Plugas Ave	15,372

Percent of Total Vehicles

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

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Plugas Avenue
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions 9.6576
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_NB_PUL	Pulgas Avenue Northbound	NB	1	125.1	0.08	9.7	31.7	3.4	25	7,686
DPM_SB_PUL	Pulgas Avenue Southbound	SB	1	123.6	0.08	9.7	31.7	3.4	25	7,686
									Total	15,372

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.00097			

2021 Hourly Traffic Volumes and DPM Emissions - DPM_NB_PUL

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.85%	296	6.17E-06	9	6.57%	505	1.05E-05	17	6.60%	507	1.06E-05
2	3.18%	245	5.10E-06	10	8.24%	633	1.32E-05	18	4.09%	314	6.55E-06
3	2.35%	180	3.76E-06	11	6.06%	466	9.71E-06	19	2.38%	183	3.81E-06
4	1.01%	77	1.61E-06	12	7.24%	556	1.16E-05	20	1.21%	93	1.93E-06
5	1.01%	77	1.61E-06	13	6.73%	518	1.08E-05	21	3.05%	234	4.88E-06
6	2.18%	167	3.49E-06	14	6.57%	505	1.05E-05	22	5.06%	389	8.10E-06
7	4.72%	363	7.56E-06	15	5.90%	453	9.44E-06	23	3.55%	273	5.69E-06
8	3.58%	276	5.74E-06	16	4.22%	324	6.76E-06	24	0.67%	51	1.07E-06
								Total		7,686	

2021 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_SB_PUL

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.85%	296	6.10E-06	9	6.57%	505	1.04E-05	17	6.60%	507	1.04E-05
2	3.18%	245	5.04E-06	10	8.24%	633	1.30E-05	18	4.09%	314	6.47E-06
3	2.35%	180	3.71E-06	11	6.06%	466	9.59E-06	19	2.38%	183	3.76E-06
4	1.01%	77	1.59E-06	12	7.24%	556	1.14E-05	20	1.21%	93	1.91E-06
5	1.01%	77	1.59E-06	13	6.73%	518	1.07E-05	21	3.05%	234	4.82E-06
6	2.18%	167	3.45E-06	14	6.57%	505	1.04E-05	22	5.06%	389	8.00E-06
7	4.72%	363	7.47E-06	15	5.90%	453	9.33E-06	23	3.55%	273	5.62E-06
8	3.58%	276	5.67E-06	16	4.22%	324	6.68E-06	24	0.67%	51	1.06E-06
								Total		7,686	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Plugas Avenue
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM2.5_NB_PUL	Pulgas Avenue Northbound	NB	1	125.1	0.08	9.7	32	1.3	25	7,686
PM2.5_SB_PUL	Pulgas Avenue Southbound	SB	1	123.6	0.08	9.7	32	1.3	25	7,686
									Total	15,372

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.002936			

2021 Hourly Traffic Volumes and PM2.5 Emissions - PM2.5_NB_PUL

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	86	5.48E-06	9	7.12%	547	3.47E-05	17	7.43%	571	3.62E-05
2	0.42%	32	2.03E-06	10	4.38%	337	2.14E-05	18	8.23%	633	4.01E-05
3	0.37%	29	1.81E-06	11	4.65%	357	2.27E-05	19	5.72%	440	2.79E-05
4	0.17%	13	8.31E-07	12	5.89%	453	2.87E-05	20	4.31%	331	2.10E-05
5	0.45%	35	2.20E-06	13	6.17%	474	3.01E-05	21	3.25%	250	1.58E-05
6	0.85%	66	4.16E-06	14	6.05%	465	2.95E-05	22	3.31%	255	1.61E-05
7	3.73%	287	1.82E-05	15	7.06%	542	3.44E-05	23	2.48%	191	1.21E-05
8	7.77%	597	3.78E-05	16	7.18%	552	3.50E-05	24	1.87%	144	9.10E-06
								Total		7,686	

2021 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - PM2.5_SB_PUL

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	86	5.41E-06	9	7.12%	547	3.43E-05	17	7.43%	571	3.58E-05
2	0.42%	32	2.00E-06	10	4.38%	337	2.11E-05	18	8.23%	633	3.96E-05
3	0.37%	29	1.79E-06	11	4.65%	357	2.24E-05	19	5.72%	440	2.75E-05
4	0.17%	13	8.21E-07	12	5.89%	453	2.84E-05	20	4.31%	331	2.07E-05
5	0.45%	35	2.17E-06	13	6.17%	474	2.97E-05	21	3.25%	250	1.56E-05
6	0.85%	66	4.11E-06	14	6.05%	465	2.91E-05	22	3.31%	255	1.59E-05
7	3.73%	287	1.80E-05	15	7.06%	542	3.40E-05	23	2.48%	191	1.19E-05
8	7.77%	597	3.74E-05	16	7.18%	552	3.46E-05	24	1.87%	144	8.99E-06
								Total		7,686	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Plugas Avenue
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_NB_PUL	Pulgas Avenue Northbound	NB	1	125.1	0.08	9.7	32	1.3	25	7,686
TEXH_SB_PUL	Pulgas Avenue Southbound	SB	1	123.6	0.08	9.7	32	1.3	25	7,686
									Total	15,372

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle (g/VMT)	0.06142			

2021 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_NB_PUL

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	86	1.15E-04	9	7.12%	547	7.26E-04	17	7.43%	571	7.58E-04
2	0.42%	32	4.24E-05	10	4.38%	337	4.47E-04	18	8.23%	633	8.39E-04
3	0.37%	29	3.79E-05	11	4.65%	357	4.74E-04	19	5.72%	440	5.83E-04
4	0.17%	13	1.74E-05	12	5.89%	453	6.01E-04	20	4.31%	331	4.39E-04
5	0.45%	35	4.59E-05	13	6.17%	474	6.29E-04	21	3.25%	250	3.31E-04
6	0.85%	66	8.70E-05	14	6.05%	465	6.17E-04	22	3.31%	255	3.38E-04
7	3.73%	287	3.80E-04	15	7.06%	542	7.19E-04	23	2.48%	191	2.53E-04
8	7.77%	597	7.92E-04	16	7.18%	552	7.32E-04	24	1.87%	144	1.90E-04
								Total		7,686	

2021 Hourly Traffic Volumes Per Direction and TOG Exhaust Emissions - TEXH_SB_PUL

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	86	1.13E-04	9	7.12%	547	7.17E-04	17	7.43%	571	7.49E-04
2	0.42%	32	4.19E-05	10	4.38%	337	4.42E-04	18	8.23%	633	8.29E-04
3	0.37%	29	3.75E-05	11	4.65%	357	4.68E-04	19	5.72%	440	5.76E-04
4	0.17%	13	1.72E-05	12	5.89%	453	5.94E-04	20	4.31%	331	4.34E-04
5	0.45%	35	4.54E-05	13	6.17%	474	6.22E-04	21	3.25%	250	3.27E-04
6	0.85%	66	8.59E-05	14	6.05%	465	6.09E-04	22	3.31%	255	3.34E-04
7	3.73%	287	3.76E-04	15	7.06%	542	7.11E-04	23	2.48%	191	2.50E-04
8	7.77%	597	7.82E-04	16	7.18%	552	7.24E-04	24	1.87%	144	1.88E-04
								Total		7,686	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Plugas Avenue
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_NB_PUL	Pulgas Avenue Northbound	NB	1	125.1	0.08	9.7	32	1.3	25	7,686
TEVAP_SB_PUL	Pulgas Avenue Southbound	SB	1	123.6	0.08	9.7	32	1.3	25	7,686
									Total	15,372

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Emissions per Vehicle per Hour (g/hour)	1.31349			
Emissions per Vehicle per Mile (g/VMT)	0.05254			

2021 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_NB_PUL

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	86	9.80E-05	9	7.12%	547	6.21E-04	17	7.43%	571	6.48E-04
2	0.42%	32	3.62E-05	10	4.38%	337	3.82E-04	18	8.23%	633	7.18E-04
3	0.37%	29	3.24E-05	11	4.65%	357	4.06E-04	19	5.72%	440	4.99E-04
4	0.17%	13	1.49E-05	12	5.89%	453	5.14E-04	20	4.31%	331	3.75E-04
5	0.45%	35	3.93E-05	13	6.17%	474	5.38E-04	21	3.25%	250	2.83E-04
6	0.85%	66	7.44E-05	14	6.05%	465	5.28E-04	22	3.31%	255	2.89E-04
7	3.73%	287	3.25E-04	15	7.06%	542	6.15E-04	23	2.48%	191	2.16E-04
8	7.77%	597	6.77E-04	16	7.18%	552	6.26E-04	24	1.87%	144	1.63E-04
								Total		7,686	

2021 Hourly Traffic Volumes Per Direction and TOG Evaporative Emissions - TEVAP_SB_PUL

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	86	9.69E-05	9	7.12%	547	6.13E-04	17	7.43%	571	6.40E-04
2	0.42%	32	3.58E-05	10	4.38%	337	3.78E-04	18	8.23%	633	7.09E-04
3	0.37%	29	3.20E-05	11	4.65%	357	4.01E-04	19	5.72%	440	4.93E-04
4	0.17%	13	1.47E-05	12	5.89%	453	5.08E-04	20	4.31%	331	3.71E-04
5	0.45%	35	3.88E-05	13	6.17%	474	5.32E-04	21	3.25%	250	2.80E-04
6	0.85%	66	7.35E-05	14	6.05%	465	5.21E-04	22	3.31%	255	2.85E-04
7	3.73%	287	3.22E-04	15	7.06%	542	6.08E-04	23	2.48%	191	2.14E-04
8	7.77%	597	6.69E-04	16	7.18%	552	6.19E-04	24	1.87%	144	1.61E-04
								Total		7,686	

JobTrain, East Palo Alto, CA - On- and Off-Site Residential
Cumulative Operation - Plugas Avenue
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_NB_PUL	Pulgas Avenue Northbound	NB	1	125.1	0.08	9.7	32	1.3	25	7,686
FUG_SB_PUL	Pulgas Avenue Southbound	SB	1	123.6	0.08	9.7	32	1.3	25	7,686
									Total	15,372

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	25			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00205			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01678			
Road Dust - Emissions per Vehicle (g/VMT)	0.01469			
otal Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.03352			

2021 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_NB_PUL

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.12%	86	6.26E-05	9	7.12%	547	3.96E-04	17	7.43%	571	4.14E-04
2	0.42%	32	2.31E-05	10	4.38%	337	2.44E-04	18	8.23%	633	4.58E-04
3	0.37%	29	2.07E-05	11	4.65%	357	2.59E-04	19	5.72%	440	3.18E-04
4	0.17%	13	9.49E-06	12	5.89%	453	3.28E-04	20	4.31%	331	2.39E-04
5	0.45%	35	2.51E-05	13	6.17%	474	3.43E-04	21	3.25%	250	1.81E-04
6	0.85%	66	4.75E-05	14	6.05%	465	3.37E-04	22	3.31%	255	1.84E-04
7	3.73%	287	2.08E-04	15	7.06%	542	3.93E-04	23	2.48%	191	1.38E-04
8	7.77%	597	4.32E-04	16	7.18%	552	4.00E-04	24	1.87%	144	1.04E-04
								Total		7,686	

2021 Hourly Traffic Volumes Per Direction and Fugitive PM2.5 Emissions - FUG_SB_PUL

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	86	6.18E-05	9	7.12%	547	3.91E-04	17	7.43%	571	4.09E-04
2	0.42%	32	2.28E-05	10	4.38%	337	2.41E-04	18	8.23%	633	4.53E-04
3	0.37%	29	2.04E-05	11	4.65%	357	2.56E-04	19	5.72%	440	3.15E-04
4	0.17%	13	9.38E-06	12	5.89%	453	3.24E-04	20	4.31%	331	2.37E-04
5	0.45%	35	2.48E-05	13	6.17%	474	3.39E-04	21	3.25%	250	1.79E-04
6	0.85%	66	4.69E-05	14	6.05%	465	3.33E-04	22	3.31%	255	1.82E-04
7	3.73%	287	2.05E-04	15	7.06%	542	3.88E-04	23	2.48%	191	1.36E-04
8	7.77%	597	4.27E-04	16	7.18%	552	3.95E-04	24	1.87%	144	1.03E-04
								Total		7,686	

JobTrain, East Palo Alto, CA - Pulgas Avenue Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Construction Residential MEI Receptor (1.5 meter receptor height)

Emission Year	2021
Receptor Information	Construction Residential MEI receptor
Number of Receptors	1
Receptor Height	1.5 meters
Receptor Distances	At Construction Residential MEI location
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological	Concentration (μg/m3)*		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0037	0.2961	0.2531

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological	PM2.5 Concentration (μg/m3)*		
Data Years	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.1757	0.1616	0.0142

JobTrain, East Palo Alto, CA - Pulgas Avenue Traffic Cancer Risk
Impacts at Construction Residential MEI - 1.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL
0	0.25	-0.25 - 0*	2021	10	0.0037	0.2961	0.2531	0.050	0.023	0.0012	0.07
1	1	0 - 1	2021	10	0.0037	0.2961	0.2531	0.604	0.278	0.0140	0.90
2	1	1 - 2	2022	10	0.0037	0.2961	0.2531	0.604	0.278	0.0140	0.90
3	1	2 - 3	2023	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
4	1	3 - 4	2024	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
5	1	4 - 5	2025	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
6	1	5 - 6	2026	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
7	1	6 - 7	2027	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
8	1	7 - 8	2028	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
9	1	8 - 9	2029	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
10	1	9 - 10	2030	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
11	1	10 - 11	2031	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
12	1	11 - 12	2032	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
13	1	12 - 13	2033	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
14	1	13 - 14	2034	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
15	1	14 - 15	2035	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
16	1	15 - 16	2036	3	0.0037	0.2961	0.2531	0.095	0.044	0.0022	0.14
17	1	16-17	2037	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
18	1	17-18	2038	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
19	1	18-19	2039	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
20	1	19-20	2040	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
21	1	20-21	2041	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
22	1	21-22	2042	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
23	1	22-23	2043	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
24	1	23-24	2044	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
25	1	24-25	2045	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
26	1	25-26	2046	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
27	1	26-27	2047	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
28	1	27-28	2048	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
29	1	28-29	2049	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
30	1	29-30	2050	1	0.0037	0.2961	0.2531	0.011	0.005	0.0002	0.02
Total Increased Cancer Risk								2.74	1.258	0.063	**4.1**

* Third trimester of pregnancy

Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.0007	0.16	0.18

JobTrain, East Palo Alto, CA - Pulgas Avenue Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site 1st Floor Daycare Child (3-5 years old) Receptors (1 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	108
Receptor Height	1 meter
Receptor Distances	7 meter grid spacing
Meteorological Conditions	
BAQMD Moffett Airfield Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction School MEI Cancer Risk Maximum Concentrations

Meteorological	Concentration (μg/m3)*		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0001	0.0075	0.0064

Construction School MEI PM2.5 Maximum Concentrations

Meteorological	PM2.5 Concentration (μg/m3)*		
Data Years	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0045	0.0041	0.0004

JobTrain, East Palo Alto, CA - Pulgas Avenue Traffic Cancer Risk
Impacts at On-Site 1st Floor Daycare Child Receptors - 1 meter receptor height
3 Year Daycare Child (3-5 years old) Exposure

Cancer Risk Calculation Method

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

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

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

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

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

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

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
8-Hr BR* =	361	1200	520	240
A =	1	1	1	1
EF =	250	250	250	250
AT =	70	70	70	70
FAH =	1.00	1.00	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG		Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
1	1	3 - 4	2021	3	0.0001	0.0075	0.0064	0.009	0.003	0.0001	0.01	0.00003	0.004	0.004
2	1	4 - 5	2022	3	0.0001	0.0075	0.0064	0.009	0.003	0.0001	0.01			
3	1	5 - 6	2023	3	0.0001	0.0075	0.0064	0.009	0.003	0.0001	0.01			
Total Increased Cancer Risk								0.03	0.008	0.000	**0.03**			

* Children assumed to be 3-5 years old with 3 years of Exposure

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May 7, 2021

Carolyn Neer, AICP
Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Via email: cneer@davidjpowers.com

Subject: 2535 Pulgas Avenue (JobTrain) Sanitary Sewer Scenarios, East Palo Alto, CA Addendum to the Air Quality and Greenhouse Gas Assessment

Dear Carolyn:

In February 2021, *Illingworth & Rodkin, Inc*. drafted an air quality and greenhouse gas (GHG) assessment for the 2535 Pulgas Avenue (JobTrain) office building project in East Palo Alto, California.[1] The applicant is considering two potential scenarios for the sanitary sewer service at the project site. Neither of these scenarios were addressed in the air quality analysis.

The preferred option would be to connect the project sewer to the East Palo Alto Sanitary District (EPASD), which would include connecting to the existing six-inch sanitary sewer main along Pulgas Avenue. The applicant would be paying for improvements downstream along Bay Road and the Bay Trail. These improvements would qualify for a statutory exemption under CEQA and would not require further analysis. If this first option is not feasible, then the second option would be to construct an on-site sanitary sewer treatment plant to serve the office building demand.

This addendum letter discusses the potential impact generated by the second option to construct an on-site sanitary sewer treatment plant.

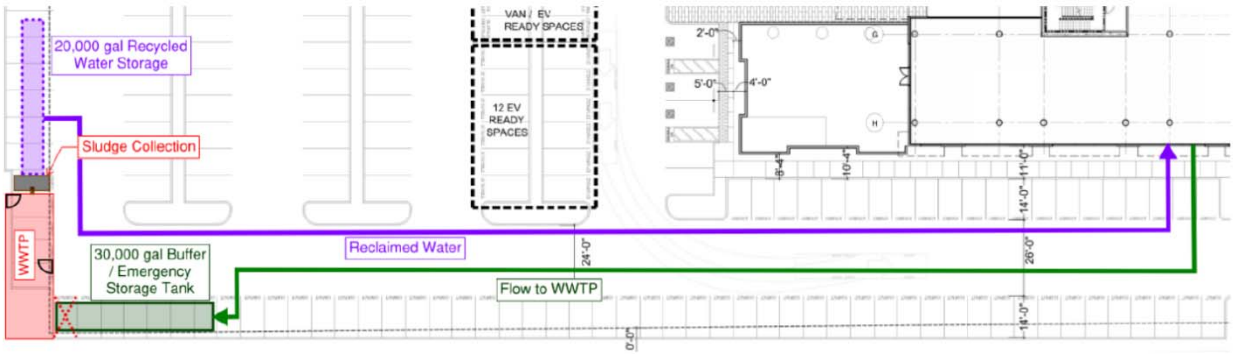
On-Site Sanitary Sewer Treatment Option

The on-site treatment facility would have a treatment capacity of 6,000 gallons per day and would be located in the southwest corner of the project site, as shown in Figure 1. The on-site sanitary sewer plant would have four main components: 1) 30,000-gallon buffer/emergency storage tank; 2) wastewater treatment plant; 3) sludge collector; and 4) 20,000-gallon recycled water storage tank. Two pipes would connect the on-site sanitary sewer treatment plant to the office building

[1] Illingworth & Rodkin, Inc., "JobTrain Air Quality and Greenhouse Gas Assessment," February 17, 2021.

transporting sewage from the office building to the treatment plant and returning processed, reclaimed water from the treatment plant back to the office building. In total, all four components of the sanitary sewer facility would occupy approximately 2,490 square feet and have a maximum height of 23 feet above grade. The maximum depth of excavation necessary to accommodate the on-site sanitary sewer system foundation would be approximately 2 feet below the existing grade. Approximately 15.37 cubic yards of soil would be exported during construction of the on-site sanitary sewer treatment plant foundation.

Figure 1. On-Site Sanitary Sewer Treatment Option



Construction Criteria Air Pollutants

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 sanitary sewer option 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.[2] The CalEEMod model output along with construction inputs are included in *Attachment 1* and EMFAC2017 vehicle emissions modeling outputs are included in *Attachment 2*.

<u>CalEEMod Inputs</u>

Land Use Inputs

The proposed on-site sanitary sewer uses were entered into CalEEMod as described in Table 1.

Table 1. Summary of Sanitary Sewer Land Use Inputs

<table>
<tr><th>Project Land Uses</th><th>Size</th><th>Units</th><th>Square Feet (sf)</th><th>Acreage</th></tr>
<tr><td>User Defined Industrial</td><td>2.5</td><td>1,000-sf</td><td>2,500</td><td rowspan="2">1.0</td></tr>
<tr><td>Other Asphalt Surface</td><td>10.0</td><td>1,000-sf</td><td>10,000</td></tr>
<tr><td colspan="5">Note: CalEEMod does not have a land use for a sewer treatment facility or sewer pipeline, so the user defined industrial and other asphalt surface uses were used and sizes were based on provided information.</td></tr>
</table>

[2] See CARB's EMFAC2017 Web Database at https://www.arb.ca.gov/emfac/2017/

Construction Inputs

Pre-manufactured wastewater equipment would be brought to and installed on the site for the on-site sewer system option. The maximum depth of excavation necessary to accommodate the on-site sanitary sewer system foundation would be approximately 2 feet below the existing grade. Approximately 15.37 cubic yards of soil would be exported during construction of the on-site sanitary sewer treatment plant foundation.

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, including equipment list and schedule, were based on CalEEMod defaults for a project of this type and size.

The sanitary sewer construction equipment worksheet included the CalEEMod default schedule for each phase minus the building exterior and interior phases since the sewer equipment would come pre-manufactured. Within each phase, the quantity of equipment to be used along with the average hours per day and total number of workdays was also based on CalEEMod defaults. The construction schedule assumed that the earliest possible start date would be May 2021 and the sanitary sewer facility would be built out over a period of approximately 2 to 3 months, or approximately 40 construction workdays.

Construction Truck Traffic Emissions

The construction traffic information was combined with EMFAC2017 motor vehicle emissions factors. 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 five trips per day for soil material 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. On-road emission rates from the years 2021 for San Mateo County were used. Table 2 provides the traffic inputs that were combined with the EMFAC2017 emission database to compute vehicle emissions.

Table 2. 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]	63.6% LDA 8.6% LDT1 27.8% LDT2	76.6% MHDT 23.4% 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	260	-	-	CalEEMod default worker trips.
Site Preparation	16	-	-	CalEEMod default worker trips.
Grading	32	-	2	16-cy of export volume. CalEEMod default worker trips.
Trenching	20	-	-	CalEEMod default worker trips.
Paving	130	-	-	CalEEMod default worker trips.

Notes: [1] Based on 2021 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

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions by the number of active workdays during that year. Table 3 shows average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ fugitive during construction of the project. As indicated in Table 3, predicted construction period emissions would not exceed the BAAQMD significance thresholds.

Table 3. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Fugitive
Construction Emissions Per Year (Tons)				
2021	0.03	0.29	0.02	0.01
Average Daily Construction Emissions Per Year (pounds/day)				
2021 (40 construction workdays)	1.51	14.56	0.76	0.70
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

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

Community Health Risk from Sanitary Sewer Facility Construction

Construction Emissions

The CalEEMod and EMFAC2017 models 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 0.0150 tons (30 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 0.0085 tons (17 pounds) for the overall construction period.

Dispersion Modeling

Dispersion modeling for the sanity sewer facility construction was conducted using the same methods in the original air quality analysis. These methods included using the U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at nearby sensitive receptors (residences), using area sources for exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions, using Moffett Federal Airfield meteorological data, and using the same sensitive receptors locations.

Summary of Construction Community Risk Impacts

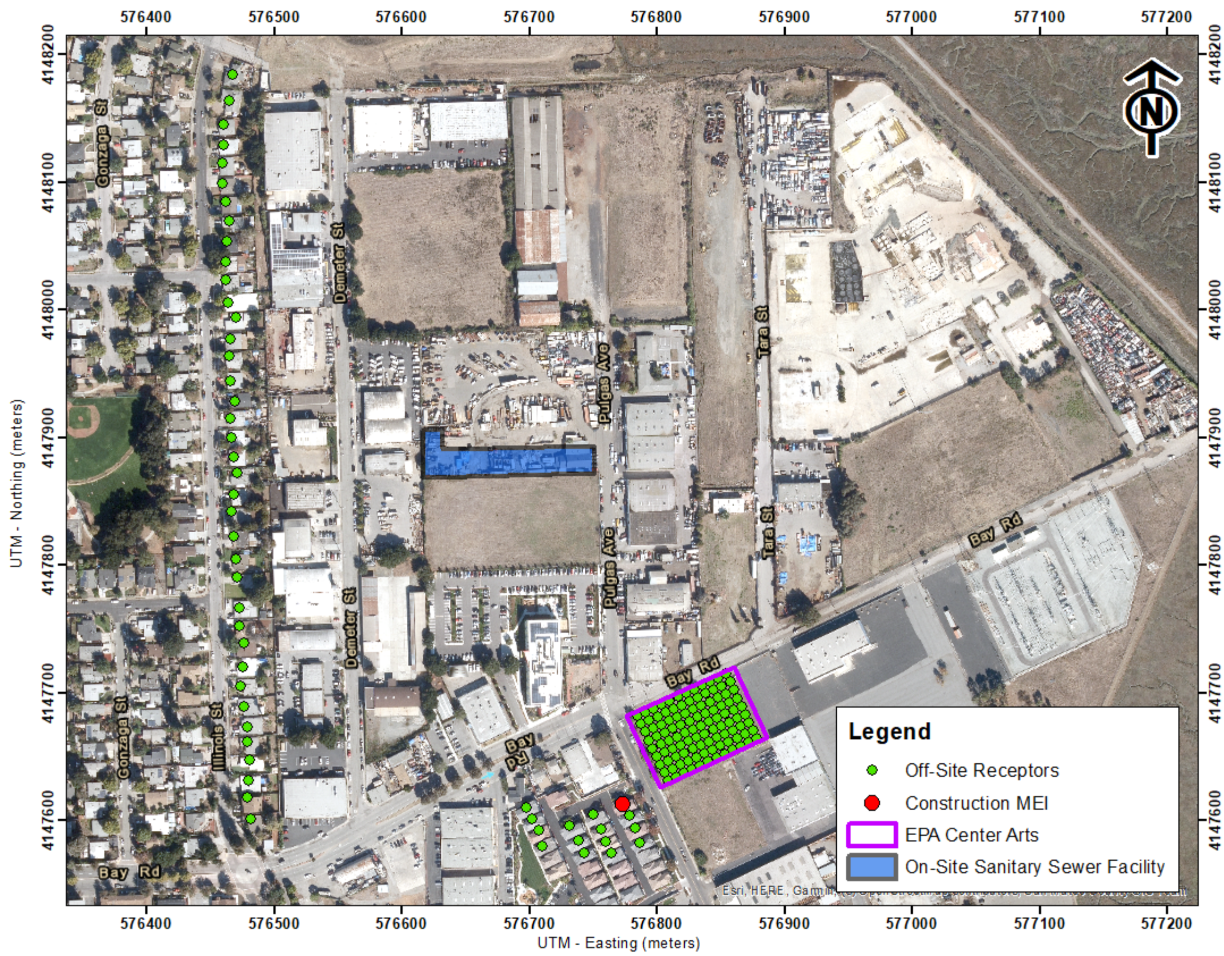
The maximum modeled annual DPM and $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors to find the MEI. Results of this assessment indicated that the MEI most affected by sewer sanitary facility construction was located at the same MEI as was found for the original project construction (i.e., a single-family residence to the south of the project site along Pulgas Avenue). The location of the MEI and nearby sensitive receptors are shown in Figure 2. Table 4 lists the community risks from construction at the location of the residential MEI. *Attachment 3* to this report includes the emission calculations used for the construction 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 art center. The maximum increased cancer risks were adjusted using child exposure parameters. The uncontrolled cancer risk, $PM_{2.5}$ concentration, and HI at the nearby art center would not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 4.

Table 4. Construction Risk Impacts at the Offsite Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ (µg/m^3)	Hazard Index
Sewer Construction	Unmitigated	1.32 (infant)	0.01	<0.01
	BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Most Affected Nearby Child – EPA Center Arts Child Receptor				
Sewer Construction	Unmitigated	0.64 (child)	0.02	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

Figure 2. Sanitary Sewer Facility Construction Site, Locations of Off-Site Sensitive Receptors, and TAC Impacts



Combined Health Risk from Sanitary Sewer Facility and Project

The community health risk from the sanitary sewer construction and the original project construction and operation at the MEI was combined to present to total project health risk impacts. As shown in Table 5, the unmitigated maximum increased cancer risks, maximum $PM_{2.5}$

concentration, and health hazard indexes from construction and operation activities of the total project at the project MEI do not exceed their respective BAAQMD single-source thresholds.

Table 5. Community Risk Impacts at the Offsite Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Sewer Construction	Unmitigated	1.32 (infant)	0.01	<0.01
Project Construction and Operation	Unmitigated	6.23 (infant)	0.04	<0.01
Total Project	Unmitigated	7.55 (infant)	0.05	<0.02
	BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?		*No*	*No*	*No*
Most Affected Nearby Child – EPA Center Arts Child Receptor				
Sewer Construction	Unmitigated	0.64 (child)	0.02	<0.01
Project Construction and Operation	Unmitigated	3.26 (infant)	0.03	<0.01
Total Project	Unmitigated	3.90 (infant)	0.05	<0.02
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?		*No*	*No*	*No*

Table 6 reports both the total project and cumulative community risk impacts at the sensitive receptors most affected by the project with sewer treatment (i.e., the MEI). Without mitigation, the total project's community risk from project activities would not exceed the single-source maximum increased cancer risk, $PM_{2.5}$ concentration, or HI thresholds. In addition, the combined unmitigated cancer risk, $PM_{2.5}$ concentration, and HI values would not exceed their respective cumulative thresholds.

Table 6. Cumulative Community Risk Impacts from Combined TAC Sources at MEI

Source		Cancer Risk (per million)	$PM_{2.5}$ concentration ($\mu g/m^3$)	Hazard Index
Total Project Impacts				
Total Project	Unmitigated	7.55 (infant)	0.05	<0.02
	BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?		*No*	*No*	*No*
Cumulative Impacts				
Bay Road, 22,606 ADT		5.21 (infant)	0.21	<0.01
Pulgas Avenue, 15,372 ADT		4.06 (infant)	0.18	<0.01
West Bay Sanitary District (Facility ID #21311, Generators), MEI +1,000 feet		0.02	--	--
Cal Spray Inc. (Facility ID #610, Spray booth & abrasives blasting) MEI 300 feet		--	<0.01	<0.01
Sobrato Center for Community Services Mitigated Construction Emissions – MEI 600 feet south		<10.0	<0.3	<1.0
Combined Sources	Unmitigated	26.82 (infant)	<0.75	<1.05
	BAAQMD Cumulative-Source Threshold	***100***	***0.8***	***10.0***
Exceed Threshold?		*No*	*No*	*No*

Operational Criteria Air Pollutant and GHG Emissions

The operational criteria air pollutant and GHG emissions for the on-site sanitary sewer treatment plant would be negligible compared to the main office project. The sanity sewer facility would not have any combustion sources that would emit criteria pollutant or GHG emissions, and any potential volatile organic compounds (VOCs) associated with the sanity sewer facility would be minimal compared to the main office project. In addition, the sanity sewer facility would not produce vehicle trips or mobile GHG emissions separately from the main office project and the other GHG emissions (i.e., waste, water) would already be accounted for in the main office building's emissions.

Odors

The proposed on-site sanitary sewer treatment plant would be a small, enclosed facility that would only serve to treat the one proposed project office building. The new pre-manufactured wastewater equipment would be equipped with modern technology that would minimize the release of any odors and the proposed sewer treatment plant does not include any lagoons, exposed treatment water, or biosolid piles that would emit odors. In addition, given that the wind direction would be coming from the north-northwest and the closest sensitive receptors are approximately 450 feet west and 650 feet south, any odors from the proposed sanity sewer facility would disperse to levels that would not be objectionable to those sensitive receptors. Therefore, the proposed on-site sanitary sewer treatment plant project would not include any sources of significant odors that would cause complaints from surrounding uses.

♦ ♦ ♦

This concludes the assessment for air quality and health risk impacts due to the second option to construct an on-site sanitary sewer treatment plant for the JobTrain project. Please feel free to contact us with any questions on the analysis or if we can be of further assistance.

Sincerely,

Casey Divine
Consultant
***Illingworth & Rodkin, Inc*.**

(I&R #19-138)

Supporting Documentation

Attachment 1 includes the CalEEMod output for project construction criteria air pollutant emissions. Also included are any modeling assumptions.

Attachment 2 includes the EMFAC2017 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

Attachment 3 includes the construction health risk assessment. AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 1: CalEEMod Modeling Inputs and Outputs

Air Quality/Noise Construction Information Data Request

Project Name: Jobtrain Sewer Treatment

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size

- ____ Dwelling Units ____1 total project acres disturbed
- ____ s.f. residential
- 2500 s.f. User Defined Industrial (Sewer System)
- 10000 s.f. Other Asphalt Surface (Pipeline to building)
- ____ s.f. other, specify:
- ____ s.f. parking garage ____ spaces
- ____ s.f. parking lot ____ spaces

Construction Hours ____ am to ____ pm

Pile Driving? Y/N?

Project include on-site GENERATOR OR FIRE PUMP during project OPERATION? 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	HP Annual Hours	Comments
	Demolition	**Start Date:**	5/3/2021	**Total phase:**	20			**Overall Import/Export Volumes**
		End Date:	5/28/2021					
1	Concrete/Industrial Saws	81	0.73	8	20	8	9461	**Demolition Volume**
	Excavators	158	0.38			0	0	Square footage of buildings to be demolished
1	Rubber-Tired Dozers	247	0.4	8	20	8	15808	(*or* total tons to be hauled)
3	Tractors/Loaders/Backhoes	97	0.37	8	20	8	17227	_?_ square feet *or*
	Other Equipment?							_?_ Hauling volume (tons)
								Any pavement demolished and hauled? _?_ tons
	Site Preparation	**Start Date:**	5/29/2021	**Total phase:**	2			
		End Date:	6/1/2021					
1	Graders	187	0.41	8	2	8	1227	
1	Rubber Tired Dozers	247	0.4	7	2	7	1383	
1	Tractors/Loaders/Backhoes	97	0.37	8	2	8	574	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	6/2/2021	**Total phase:**	4			
		End Date:	6/7/2021					**Soil Hauling Volume**
	Excavators	158	0.38			0	0	Export volume = _16_ cubic yards?
1	Graders	187	0.41	6	4	6	1840	Import volume = _?_ cubic yards?
1	Rubber Tired Dozers	247	0.4	6	4	6	2371	
	Concrete/Industrial Saws	81	0.73			0	0	
1	Tractors/Loaders/Backhoes	97	0.37	7	4	7	1005	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	6/8/2021	**Total phase:**	4			
		End Date:	6/11/2021					
1	Tractor/Loader/Backhoe	97	0.37	8	4	8	1148	
1	Excavators	158	0.38	8	4	8	1921	
	Other Equipment?							
	Building - Exterior	**Start Date:**		**Total phase:**				**Cement Trucks? _?_ Total Round-Trips**
		End Date:						
	Cranes	231	0.29			#DIV/0!	0	Electric? (Y/N)___ Otherwise assumed diesel
	Forklifts	89	0.2			#DIV/0!	0	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
	Generator Sets	84	0.74			#DIV/0!	0	Or temporary line power? (Y/N) ___
	Tractors/Loaders/Backhoes	97	0.37			#DIV/0!	0	
	Welders	46	0.45			#DIV/0!	0	
	Other Equipment?							
Building - Interior/Architectural Coating		**Start Date:**		**Total phase:**				
		End Date:						
	Air Compressors	78	0.48			#DIV/0!	0	
	Aerial Lift	62	0.31			#DIV/0!	0	
	Other Equipment?							
	Paving	**Start Date:**	6/12/2021	**Total phase:**	10			
		Start Date:	6/25/2021					
1	Cement and Mortar Mixers	9	0.56	6	10	6	302	
1	Pavers	130	0.42	6	10	6	3276	**Asphalt? ___ cubic yards or ____ round trips?**
1	Paving Equipment	132	0.36	8	10	8	3802	
1	Rollers	80	0.38	7	10	7	2128	
1	Tractors/Loaders/Backhoes	97	0.37	8	10	8	2871	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	

Equipment types listed in "Equipment Types" worksheet tab.

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

Complete one sheet for each project component

It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate

Modify horsepower or load factor, as appropriate

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	**CO2e**	
Year	Tons				MT	
Construction Equipment						
2021	0.0297	0.2905	0.015	0.0139	34.152	
EMFAC						
2021	0.0004	0.0006	0.0003	0.0001	1.47	
Total Construction Emissions by Year						
2021	0.03	0.29	0.02	0.01	35.62	
	Total Construction Emissions					
Tons	0.03	0.29	0.02	0.01	35.62	
Pounds/Workdays	*Average Daily Emissions*				Workdays	
2021	1.51	14.56	0.76	0.70		**40**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	1.51	14.56	0.76	0.70	0.00	
Average	1.51	14.56	0.76	0.70	0.00	40.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

OnSite Sewer Treatment JobTrain 2535 Pulgas Ave, E Palo Alto

San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	2,500.00	0
Other Asphalt Surfaces	10.00	1000sqft	0.23	10,000.00	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)	138	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PCE 2018 Co2 Intensity rate w/ 90% PCE & 10% PGE = 138

Land Use - Provided land use description - 2,500sf sewer system, esimtaed 10,000-sf pipeline to building

Construction Phase - Default construction scheudle - pre-manufacture treatment system - no building const exterior / interior

Off-road Equipment -

Off-road Equipment - Default construction equipment & hours

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Trenching added

Grading - grading = 16cy export

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblGrading	MaterialExported	0.00	16.00
tblLandUse	LandUseSquareFeet	0.00	2,500.00
tblLandUse	LotAcreage	0.00	1.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	138

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	0.0297	0.2905	0.2248	3.9000e-004	0.0175	0.0150	0.0324	8.4900e-003	0.0139	0.0224	0.0000	33.9258	33.9258	9.0500e-003	0.0000	34.1520
Maximum	**0.0297**	**0.2905**	**0.2248**	**3.9000e-004**	**0.0175**	**0.015**	**0.0324**	**8.4900e-003**	**0.0139**	**0.0224**	**0.0000**	**33.9258**	**33.9258**	**9.0500e-003**	**0.0000**	**34.152**

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	0.0297	0.2905	0.2248	3.9000e-004	0.0175	0.0150	0.0324	8.4900e-003	0.0139	0.0224	0.0000	33.9257	33.9257	9.0500e-003	0.0000	34.1520
Maximum	**0.0297**	**0.2905**	**0.2248**	**3.9000e-004**	**0.0175**	**0.0150**	**0.0324**	**8.4900e-003**	**0.0139**	**0.0224**	**0.0000**	**33.9257**	**33.9257**	**9.0500e-003**	**0.0000**	**34.1520**

	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**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**5-3-2021**	**8-2-2021**	0.3125	0.3125
		Highest	0.3125	0.3125

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	0.0119	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0119**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

Mitigated Operational

Category	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
	tons/yr										MT/yr					
Area	0.0119	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0119**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

	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	5/3/2021	5/28/2021	5	20	
2	Site Preparation	Site Preparation	5/29/2021	6/1/2021	5	2	
3	Grading	Grading	6/2/2021	6/7/2021	5	4	
4	Trenching	Trenching	6/8/2021	6/11/2021	5	4	
5	Paving	Paving	6/12/2021	6/25/2021	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0.23

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	2.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Trenching	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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					
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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	3.3000e-004	2.2000e-004	2.3400e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8219	0.8219	1.0000e-005	0.0000	0.8223
Total	**3.3000e-004**	**2.2000e-004**	**2.3400e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8219**	**0.8219**	**1.0000e-005**	**0.0000**	**0.8223**

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	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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	3.3000e-004	2.2000e-004	2.3400e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8219	0.8219	1.0000e-005	0.0000	0.8223
Total	**3.3000e-004**	**2.2000e-004**	**2.3400e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8219**	**0.8219**	**1.0000e-005**	**0.0000**	**0.8223**

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					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5600e-003	0.0174	7.5600e-003	2.0000e-005		7.7000e-004	7.7000e-004		7.0000e-004	7.0000e-004	0.0000	1.5118	1.5118	4.9000e-004	0.0000	1.5241
Total	**1.5600e-003**	**0.0174**	**7.5600e-003**	**2.0000e-005**	**5.8000e-003**	**7.7000e-004**	**6.5700e-003**	**2.9500e-003**	**7.0000e-004**	**3.6500e-003**	**0.0000**	**1.5118**	**1.5118**	**4.9000e-004**	**0.0000**	**1.5241**

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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0506	0.0506	0.0000	0.0000	0.0506
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0506**	**0.0506**	**0.0000**	**0.0000**	**0.0506**

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					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5600e-003	0.0174	7.5600e-003	2.0000e-005		7.7000e-004	7.7000e-004		7.0000e-004	7.0000e-004	0.0000	1.5118	1.5118	4.9000e-004	0.0000	1.5241

Total	**1.5600e-003**	**0.0174**	**7.5600e-003**	**2.0000e-005**	**5.8000e-003**	**7.7000e-004**	**6.5700e-003**	**2.9500e-003**	**7.0000e-004**	**3.6500e-003**	**0.0000**	**1.5118**	**1.5118**	**4.9000e-004**	**0.0000**	**1.5241**

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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0506	0.0506	0.0000	0.0000	0.0506
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0506**	**0.0506**	**0.0000**	**0.0000**	**0.0506**

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					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5800e-003	0.0287	0.0127	3.0000e-005		1.2800e-003	1.2800e-003		1.1700e-003	1.1700e-003	0.0000	2.4767	2.4767	8.0000e-004	0.0000	2.4968
Total	**2.5800e-003**	**0.0287**	**0.0127**	**3.0000e-005**	**9.8300e-003**	**1.2800e-003**	**0.0111**	**5.0500e-003**	**1.1700e-003**	**6.2200e-003**	**0.0000**	**2.4767**	**2.4767**	**8.0000e-004**	**0.0000**	**2.4968**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.0000e-004	1.4000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0821	0.0821	1.0000e-005	0.0000	0.0824
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	4.0000e-005	3.0000e-005	2.9000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1012	0.1012	0.0000	0.0000	0.1012
Total	**5.0000e-005**	**3.3000e-004**	**4.3000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1833**	**0.1833**	**1.0000e-005**	**0.0000**	**0.1836**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5800e-003	0.0287	0.0127	3.0000e-005		1.2800e-003	1.2800e-003		1.1700e-003	1.1700e-003	0.0000	2.4767	2.4767	8.0000e-004	0.0000	2.4968
Total	**2.5800e-003**	**0.0287**	**0.0127**	**3.0000e-005**	**9.8300e-003**	**1.2800e-003**	**0.0111**	**5.0500e-003**	**1.1700e-003**	**6.2200e-003**	**0.0000**	**2.4767**	**2.4767**	**8.0000e-004**	**0.0000**	**2.4968**

Mitigated Construction Off-Site

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

Hauling	1.0000e-005	3.0000e-004	1.4000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0821	0.0821	1.0000e-005	0.0000	0.0824
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	4.0000e-005	3.0000e-005	2.9000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1012	0.1012	0.0000	0.0000	0.1012
Total	**5.0000e-005**	**3.3000e-004**	**4.3000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1833**	**0.1833**	**1.0000e-005**	**0.0000**	**0.1836**

3.5 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	8.3000e-004	8.1000e-003	0.0111	2.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	1.4535	1.4535	4.7000e-004	0.0000	1.4652
Total	**8.3000e-004**	**8.1000e-003**	**0.0111**	**2.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.0000e-004**	**4.0000e-004**	**0.0000**	**1.4535**	**1.4535**	**4.7000e-004**	**0.0000**	**1.4652**

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	3.0000e-005	2.0000e-005	1.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0632	0.0632	0.0000	0.0000	0.0633

Total	3.0000e-005	2.0000e-005	1.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0632	0.0632	0.0000	0.0000	0.0633

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	8.3000e-004	8.1000e-003	0.0111	2.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	1.4535	1.4535	4.7000e-004	0.0000	1.4652
Total	**8.3000e-004**	**8.1000e-003**	**0.0111**	**2.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.0000e-004**	**4.0000e-004**	**0.0000**	**1.4535**	**1.4535**	**4.7000e-004**	**0.0000**	**1.4652**

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	3.0000e-005	2.0000e-005	1.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0632	0.0632	0.0000	0.0000	0.0633
Total	**3.0000e-005**	**2.0000e-005**	**1.8000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0632**	**0.0632**	**0.0000**	**0.0000**	**0.0633**

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	3.8700e-003	0.0387	0.0443	7.0000e-005		2.0800e-003	2.0800e-003		1.9100e-003	1.9100e-003	0.0000	5.8825	5.8825	1.8600e-003	0.0000	5.9291
Paving	3.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.1700e-003**	**0.0387**	**0.0443**	**7.0000e-005**		**2.0800e-003**	**2.0800e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**5.8825**	**5.8825**	**1.8600e-003**	**0.0000**	**5.9291**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.1000e-004	1.1700e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4109	0.4109	1.0000e-005	0.0000	0.4111
Total	**1.7000e-004**	**1.1000e-004**	**1.1700e-003**	**0.0000**	**5.1000e-004**	**0.0000**	**5.1000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4109**	**0.4109**	**1.0000e-005**	**0.0000**	**0.4111**

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	3.8700e-003	0.0387	0.0443	7.0000e-005		2.0800e-003	2.0800e-003		1.9100e-003	1.9100e-003	0.0000	5.8825	5.8825	1.8600e-003	0.0000	5.9291
Paving	3.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.1700e-003**	**0.0387**	**0.0443**	**7.0000e-005**		**2.0800e-003**	**2.0800e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**5.8825**	**5.8825**	**1.8600e-003**	**0.0000**	**5.9291**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.1000e-004	1.1700e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4109	0.4109	1.0000e-005	0.0000	0.4111
Total	**1.7000e-004**	**1.1000e-004**	**1.1700e-003**	**0.0000**	**5.1000e-004**	**0.0000**	**5.1000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4109**	**0.4109**	**1.0000e-005**	**0.0000**	**0.4111**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Industrial	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
Other Asphalt Surfaces	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
User Defined Industrial	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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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					
Other Asphalt Surfaces	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
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**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

	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					
Other Asphalt Surfaces	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

User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0119	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Unmitigated	0.0119	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004

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	1.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0119**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

Mitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	1.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0104					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0119**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Category	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000

Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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 2: EMFAC2021 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	13	0	260	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	2808	0	0
Site Preparation	8	0	16	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	172.8	0	0
Grading	8	0	32	0	2	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	345.6	0	40
Trenching	5	0	20	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	216	0	0
Paving	13	0	130	0	0	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	1404	0	0

Number of Days Per Year					
2021	5/3/21	6/25/21	54	**40**	
			54	**40**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	5/3/2021	5/28/2021	5	20
Site Preparation	5/29/2021	6/1/2021	5	2
Grading	6/2/2021	6/7/2021	5	4
Trenching	6/8/2021	6/11/2021	5	4
Paving	6/12/2021	6/25/2021	5	10

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	0.0004	0.0006	0.0049	0.0000	0.0016	0.0003	0.0019	0.0002	0.0001	0.0004	1.4664
Toxic Air Contaminants (1 Mile Trip Length)											
2021	0.0004	0.0002	0.0016	0.0000	0.0002	0.00002	0.0002	0.00002	0.0000	0.0000	0.1590

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

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_RUNE	NOx_IDLE	NOx_STRE	PM2.5_RU	PM2.5_IDL	PM2.5_STF	PM2.5_PM	PM2.5_PM	PM10_RUI
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
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
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
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
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
San Mateo	2021	LDA	Aggregate	Aggregate	Electricity	6731.919	227344.6	33418.54	0	0	0	0	0	0	0.002	0.01575	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
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
San Mateo	2021	LDT1	Aggregate	Aggregate	Electricity	251.7812	8876.24	1265.331	0	0	0	0	0	0	0.002	0.01575	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
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
San Mateo	2021	LDT2	Aggregate	Aggregate	Electricity	1346.583	38287.31	6798.974	0	0	0	0	0	0	0.002	0.01575	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
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
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
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
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
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
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
San Mateo	2021	MDV	Aggregate	Aggregate	Electricity	499.1085	14927.81	2561.27	0	0	0	0	0	0	0.002	0.01575	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
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
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
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
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
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
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
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
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
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
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

Vehicle Cat	Fuel	PM10_IDLI	PM10_STR	PM10_PM	PM10_PM	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX	CH4_STREX	N2O_RUNE	N2O_IDLEX	N2O_STRE	ROG_RUNE	ROG_IDLEX	ROG_STRE
HHDT	Gasoline	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
HHDT	Diesel	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
HHDT	Natural Ga	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
LDA	Gasoline	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
LDA	Diesel	0	0	0.008	0.03675	206.756	0	0	0.000628	0	0	0.032499	0	0	0.01353	0	0
LDA	Electricity	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0
LDT1	Gasoline	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
LDT1	Diesel	0	0	0.008	0.03675	411.4568	0	0	0.008976	0	0	0.064675	0	0	0.193251	0	0
LDT1	Electricity	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0
LDT2	Gasoline	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
LDT2	Diesel	0	0	0.008	0.03675	279.7984	0	0	0.000617	0	0	0.04398	0	0	0.013286	0	0
LDT2	Electricity	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0
LHDT1	Gasoline	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
LHDT1	Diesel	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
LHDT2	Gasoline	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
LHDT2	Diesel	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
MCY	Gasoline	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
MDV	Gasoline	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
MDV	Diesel	0	0	0.008	0.03675	364.5115	0	0	0.000441	0	0	0.057296	0	0	0.009496	0	0
MDV	Electricity	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0
MH	Gasoline	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
MH	Diesel	0	0	0.016	0.13034	1008.352	0	0	0.003968	0	0	0.158499	0	0	0.085434	0	0
MHDT	Gasoline	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
MHDT	Diesel	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
OBUS	Gasoline	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
OBUS	Diesel	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
SBUS	Gasoline	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
SBUS	Diesel	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
UBUS	Gasoline	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
UBUS	Diesel	0	0	0.031575	0.074388	1767.879	0	0	0.243745	0	0	0.277886	0	0	0.003483	0	0
UBUS	Natural Ga	0	0	0.03476	0.065284	2042.655	0	0	6.540523	0	0	0.416409	0	0	0.093451	0	0

Vehicle Cat	Fuel	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNI	TOG_RESTI	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
HHDT	Gasoline	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
HHDT	Diesel	0	0	0	0	0.165721	3.728293	0	0	0	0	0	0.533324	39.73895	0	0.016024	0.079241	0
HHDT	Natural Ga	0	0	0	0	3.552887	1.264291	0	0	0	0	0	10.85713	18.88665	0	0	0	0
LDA	Gasoline	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
LDA	Diesel	0	0	0	0	0.015403	0	0	0	0	0	0	0.197747	0	0	0.001955	0	0
LDA	Electricity	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
LDT1	Gasoline	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
LDT1	Diesel	0	0	0	0	0.220004	0	0	0	0	0	0	1.066027	0	0	0.00389	0	0
LDT1	Electricity	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
LDT2	Gasoline	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
LDT2	Diesel	0	0	0	0	0.015125	0	0	0	0	0	0	0.1127	0	0	0.002645	0	0
LDT2	Electricity	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
LHDT1	Gasoline	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
LHDT1	Diesel	0	0	0	0	0.163447	0.124954	0	0	0	0	0	0.556151	0.909745	0	0.005096	0.001242	0
LHDT2	Gasoline	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
LHDT2	Diesel	0	0	0	0	0.153437	0.124954	0	0	0	0	0	0.517242	0.909745	0	0.005712	0.001987	0
MCY	Gasoline	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
MDV	Gasoline	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
MDV	Diesel	0	0	0	0	0.010811	0	0	0	0	0	0	0.167682	0	0	0.003446	0	0
MDV	Electricity	0.004888	0	0.003128	0.012002	0	0	0	0.004888	0	0.003128	0.012002	0	0	0	0	0	0
MH	Gasoline	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
MH	Diesel	0	0	0	0	0.09726	0	0	0	0	0	0	0.283679	0	0	0.009533	0	0
MHDT	Gasoline	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
MHDT	Diesel	0	0	0	0	0.181717	0.132822	0	0	0	0	0	0.466643	2.520172	0	0.009925	0.008387	0
OBUS	Gasoline	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
OBUS	Diesel	0	0	0	0	0.141474	0.817393	0	0	0	0	0	0.414399	8.333469	0	0.011482	0.017825	0
SBUS	Gasoline	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
SBUS	Diesel	0	0	0	0	0.13994	0.347361	0	0	0	0	0	0.310277	5.196214	0	0.011043	0.035264	0
UBUS	Gasoline	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
UBUS	Diesel	0	0	0	0	0.24876	0	0	0	0	0	0	0.395642	0	0	0.016713	0	0
UBUS	Natural Ga	0	0	0	0	6.675083	0	0	0	0	0	0	50.89105	0	0	0	0	0

Attachment 3: Construction Health Risk Calculations

On-Site Sanitary Sewer Facility, JobTrain, East Palo Alto, 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	Construction	0.0150	CON_DPM	30.0	0.00915	1.15E-03	3076	3.75E-07

Construction Hours

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

On-Site Sanitary Sewer Facility, JobTrain, East Palo Alto, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2021	Construction	CON_FUG	0.0085	17.0	0.00518	6.53E-04	3,076	2.12E-07

Construction Hours

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

On-Site Sanitary Sewer Facility, JobTrain, East Palo Alto, CA
- Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million) Infant/Child	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021	0.0075	0.0044	1.32	0.001	0.01

Maximum Impacts at EPA Center Arts

Construction Year	Unmitigated Emissions				
	Maximum Concentrations: Exhaust PM2.5/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021	0.0102	0.0058	0.64	0.002	0.02

On-Site Sanitary Sewer Facility, JobTrain, East Palo Alto, 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

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Maximum Hazard Index	Maximum Fugitive PM2.5	Maximum Total PM2.5
0	0.25	-0.25 - 0*	2021	0.0075	10	0.10	2021	0.0075	-	-			
1	1	0 - 1	2021	0.0075	10	1.22	2021	0.0075	1	0.02	0.0015	0.0044	0.0119
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**1.3**				**0.02**			

* Third trimester of pregnancy

On-Site Sanitary Sewer Facility, JobTrain, East Palo Alto, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at EPA Center Arts (13 years and older) - 1.5 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 (7 days/5 days) = 3.73
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	**Exposure Duration (years)**	**Age**	**Child - Exposure Information: DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Child Cancer Risk (per million)**
1	1	13 - 14	2021	0.0102	3	0.6
2	1			0.0000	3	0.0
3	1			0.0000	3	0.0
4	1			0.0000	3	0.0
5	1			0.0000	3	0.0
6	1			0.0000	3	0.0
7	1			0.0000	3	0.0
8	1			0.0000	3	0.0
9	1			0.0000	3	0.0
Total Increased Cancer Risk						**0.6**

* Children assumed to be 13 years of age or older with 2 years of Construction Exposure

Maximum Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0020	0.0058	0.0160