Appendix A – Construction Community Risk Assessment

3300 EL CAMINO REAL CONSTRUCTION COMMUNITY RISK ASSESSMENT

Palo Alto, California

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Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of the proposed office development located at 3300 El Camino Real in Palo Alto, California. The air quality impacts from this project would be associated with construction of the new building. Air pollutant emissions associated with construction of the project were predicted using appropriate computer models. In addition, the potential project construction health risk impacts and the impact of existing toxic air contaminant (TAC) sources affecting the nearby sensitive receptors were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1] BAAQMD recommends using a 1,000-foot screening radius around the project site for purposes of identifying community health risk from existing sources of TACs.

Project Description

The approximately 2.89-acre site is currently occupied by a surface parking lot. The project would involve construction of an approximately 52,872 square-foot (sf) two-story office building. The project would also include a surface parking lot and one level of underground parking. There would be 86 parking spaces provided on the surface lot and 95 spaces provided in the underground garage, for a total of 181 parking spaces. In addition, there would be a 500-kilowatt generator powered by a 670-horsepower diesel engine in the underground parking garage.

Air Quality Setting

The project is located in Santa Clara 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 except for ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

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

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels

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

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 increase the risk of developing cancer. 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.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors since they are more susceptible to TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are in the single-family residences to the southeast and northeast of the project site. In addition, there is a daycare (Building Kidz of Palo Alto - infants zero years and older) to the north of the site. This project would not introduce new sensitive receptors (i.e., residents) to the area.

Regulatory Setting

Federal Regulations

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

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

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

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

State Regulations

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

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

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

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

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

Bay Area Air Quality Management District (BAAQMD)

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

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

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

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts

[4] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.
[5] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. *Attachment 1* includes detailed community risk modeling methodology.

BAAQMD Rules and Regulations

Combustion equipment associated with the proposed project that includes new diesel engines to power generators and possibly new natural gas-fired boilers 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. 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 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

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.

Stationary Diesel Airborne Toxic Control Measure

The BAAQMD administers the CARB'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 stationary emergency standby diesel engines larger than 50 hp. These limits vary based on maximum engine power. All engines are limited to PM emission rates of 0.15 g/hp-hour, regardless of size. This ACTM limits engine operation 50 hours per year for routine testing and maintenance.

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 and 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.

BACT for Diesel Generator Engines

Since the generators will be used exclusively for emergency use during involuntary loss of power, the BACT levels listed for IC compression engines in the BAAQMD BACT Guidelines would apply. These are provided for two separate size ranges of diesel engines:

I.C. Engine – Compression Ignition >50hp and <1.000hp: BAAQMD applies BACT 2 emission limits based on the ATCM for stationary emergency standby diesel engines larger than 50 brake-horsepower (BHP). NOx emission factor limit is subject to the CARB ACTM that ranges from 3.0 to 3.5 grams per horsepower hour (g/hp-hr). The PM (PM_{10} or $PM_{2.5}$) limit is 0.15 g/hp-hr per CARB's ACTM.

I.C. Engine – Compression Ignition <999hp: BAAQMD applies specific BACT emission limits for stationary emergency standby diesel engines equal or larger than 1,000 brake-horsepower (BHP). NOx emission factor limit is subject to the CARB ACTM that ranges from 0.5 g/hp-hr. The PM (PM_{10} or $PM_{2.5}$) limit is 0.02 g/hp-hr. POC (i.e., ROG) limits are 0.14 g/hp-hr.

City of Palo Alto Comprehensive Plan Update Environmental Impact Report (EIR)

Published February 2016, the Comprehensive Plan Update EIR for the City of Palo Alto, evaluated potential impacts of future development under the Comprehensive Plan. The Comprehensive Plan EIR identified mitigation measures that would make impacts less than significant. Chapter 4.2 in the document evaluated air quality impacts.[6] The following mitigation measures are applicable to this project:

Air Quality

Mitigation Measure AIR-2a: As part of the City's development approval process, the City shall require applicants for future development projects to comply with the current BAAQMD basic control measures for reducing construction emissions of PM_{10} (Table 8-2, Basic Construction Mitigation Measures Recommended for All Proposed Projects, of the BAAQMD CEQA Guidelines).

Mitigation Measure AIR-2b: Prior to issuance of construction permits, development project applicants that are subject to CEQA and have the potential to exceed the BAAQMD screening-criteria listed in the BAAQMD CEQA Guidelines shall prepare and submit to the City of Palo Alto a technical assessment evaluating potential project construction-related air quality impacts. The evaluation shall be prepared in conformance with BAAQMD methodology in assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in the BAAQMD CEQA Guidelines, the City of Palo Alto shall require that applicants for new development projects incorporate mitigation measures (Table 8-3, Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Threshold, of the BAAQMD CEQA Guidelines or applicable construction mitigation measures subsequently approved by BAAQMD) to reduce air pollutant emissions during construction activities to below these thresholds. These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City's Planning and Community Environment Department.

[6] Placeworks, 2016. *Comprehensive Plan Update Environmental Impact Report*. February. Web: https://www.cityofpaloalto.org/civicax/filebank/documents/63453

Mitigation Measure AIR-2c: Prior to issuance of construction permits, development project applicants that are subject to CEQA and have the potential to exceed the BAAQMD screening-criteria listed in the BAAQMD CEQA Guidelines shall prepare and submit to the City of Palo Alto a technical assessment evaluating potential project operation phase-related air quality impacts. The evaluation shall be prepared in conformance with BAAQMD methodology in assessing air quality impacts. If operational-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in BAAQMD's CEQA Guidelines, the City of Palo Alto Planning and Community Environment Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities.

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 for health risk assessments, which were used in this analysis and are summarized in Table 1. Impacts above these thresholds are considered potentially significant.

Table 1. BAAQMD Air Quality CEQA Health Risk Significance Thresholds

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

Construction Community Risk Impacts and Mitigation Measures

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

Community risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC (i.e., DPM). These exhaust emissions pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[7] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated. The methodology for computing community risks impacts is contained in *Attachment 1*.

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative emissions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMission FACtors 2021 (EMFAC2021) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[8] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

Land Use Inputs

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

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
General Office Building	52.87	1,000-sf	52,872	2.89
Enclosed Parking with Elevator	95	Parking Spaces	38,000	
Parking Lot	86	Parking Spaces	34,400	

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

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

The project 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. 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 the end of September 2021 and would be built out over a period of approximately 15 months, or 327 construction workdays. The earliest year of full operation was assumed to be 2023.

Construction Truck Traffic Emissions

Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the estimate of soil material imported and/or exported to the site and the estimate of cement and asphalt truck trips. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. The total trips for those were computed by multiplying the daily trip rate by the number of days in that phase. Haul trips for demolition and grading were estimated from the provided demolition and grading volumes by assuming each truck could carry 10 tons per load. The number of cement and asphalt total round haul trips were provided for the project and converted to total one-way trips, assuming two trips per delivery.

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2017 motor vehicle emission factor model. This model has been superseded by the EMFAC2021 model; however, CalEEMod has not been updated to include EMFAC2021. Therefore, the construction traffic information was combined with EMFAC2021 motor vehicle emissions factors. EMFAC2021 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod default assumptions, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including cement trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (soil import/export). Since CalEEMod does not address cement trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On road emissions in Santa Clara County for the

years 2021-2022 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2021 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2021 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	67% LDA 6% LDT1 26% LDT2	5% MHDT 95% 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	50	-	87	880 tons pavement demolition. CalEEMod default worker trips.
Grading	430	-	2,000	16,000-cy soil export. CalEEMod default worker trips.
Trenching	30	-	-	CalEEMod default worker trips.
Building Construction	10,810	4,830	900	450 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	369	-	-	CalEEMod default worker trips.
Paving	880	-	18	300-cy asphalt. CalEEMod default worker trips.

Notes: [1] Based on Year 2021-2022 EMFAC2021 light-duty vehicle fleet mix for Santa Clara County.
[2] Includes demolition and grading trips estimated by CalEEMod based on amount of material to be removed. Cement and asphalt trips estimated based on data provided by the applicant.

Summary of Computed Construction Period Emissions

The CalEEMod model and EMFAC2021 emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages being 0.03 tons (63 pounds). The on-road emissions are a result of haul truck travel during grading activities, worker travel, and vendor deliveries during construction. A trip length of half a 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 0.002 tons (5 pounds) for the overall construction period.

Dispersion Modeling

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

of emission activities for CEQA projects.[9] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[10] 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 is used to represent emissions from sources with plume rise, such as construction equipment, and should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe.

For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 7 feet (2 meters) was used for the area source. Fugitive dust emissions at construction sites come from a variety of sources, including truck and equipment travel, grading activities, truck loading (with loaders) and unloading (rear or bottom dumping), loaders and excavators moving and transferring soil and other materials, etc. All 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 these reasons, a 7-foot release height was used as the average release height across the construction site. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources.

AERMOD Inputs and Meteorological Data

The modeling used a five-year data set (2013 - 2017) of hourly meteorological data from the Moffett Federal Airfield prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring daily between 8:00 a.m. to 4:30 p.m., when the majority of construction activity is expected to occur according to the project applicant. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2021-2022 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing height on the first and second floors of nearby single- and multi-family residences.[11] A receptor height of 3 feet (1 meter) was used to represent the breathing height of infants and children at the daycare.

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

[10] 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

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

Summary of Construction Community Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the Office of Environmental Health Hazard Assessment (OEHHA) guidance for age sensitivity factors and exposure parameters as recommended by BAAQMD (see *Attachment 1)*. Non-cancer health risks and maximum $PM_{2.5}$ concentrations were also calculated and identified. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. Third trimester, infant, child, and adult exposures were assumed to occur at all residences during the entire construction period. Students at the daycare were assumed to be zero years and older. The infant (ages 0 through 2 years old) cancer risk parameters were used to calculate the increased cancer risk for the daycare students.

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

The maximum modeled annual DPM and $PM_{2.5}$ concentrations, which includes both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction residential MEI was located on the first floor (5 feet above ground) at the closest single-family home southeast of the project site. Table 4 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

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

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

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	8.32 (infant)	0.05	0.01
	BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Most Affected Nearby School – Building Kidz of Palo Alto				
Project Construction	Unmitigated	0.46 (infant)	<0.01	<0.01
	BAAQMD Single-Source Threshold	***10.0***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	No	No

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

Community Risks from Project Operation – Traffic and Generators

Operation of the project would generate emissions from mobile sources (i.e., traffic) and stationary sources (i.e., generator). While these emissions would not be as intensive 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 approximately 515 total daily trips[12] with most of the trips being from light-duty gasoline-powered vehicles (i.e., passenger cars). Per BAAQMD recommended risks and methodology, a road with less than 10,000 total vehicle per day is considered a low-impact source

[12] Hexagon Transportation Consultants, Inc., *3300 El Camino Real Office Development Transportation Analysis*, May 26,2021.

of TACs and not considered in the CEQA analysis.[13] Therefore, emissions from project-generated traffic are considered negligible and not included in this analysis.

Project Stand-By Diesel Generator

The project proposes to include one stand-by 500-kilowatt (kW) generator powered by a 670-horsepower (HP) diesel engine in the southwest corner of the underground garage. 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 U.S. EPA emission standards and consume commercially available California 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 off-site sensitive receptor locations (nearby residences). The same receptors and breathing heights used in the construction dispersion modeling were used for the generator model. Additionally, the same BAAQMD Moffett Federal Airfield meteorological data was used. Stack parameters (stack height, exhaust flow rate, and exhaust gas temperature) for modeling the generator were based on BAAQMD default parameters for emergency generators.[14] Annual average DPM and $PM_{2.5}$ concentrations were modeled assuming that the generator operation 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 were also adjusted for exposure duration to account for the MEI being exposed to construction for 15 months of the 30-year period. The exposure duration was adjusted for 29 years of exposure. Table 5 lists the community risks from stand-by diesel generator at the location of residential MEI. The emissions and health risk calculations for the proposed generator are included in *Attachment 4*.

[13] 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

[14] The San Francisco Community Risk Reduction Plan: Technical Support Document, BAAQMD, San Francisco Dept. of Public Health, and San Francisco Planning Dept., December 2012

Cumulative Community Risks of all TAC Sources at Project MEI

The cumulative risk impacts from a project are the combination of construction and operation sources. In this case, these sources include on-site construction activity and operation of the project generator. The project impact is computed by adding the construction cancer risk to the increased cancer risk 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 15 months of construction cancer risks and 29 years of operational (includes stand-by 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.

Project risk impacts are shown in Table 5. The unmitigated maximum cancer risks, $PM_{2.5}$ concentration, and HI from construction and operational activities at the residential project MEI location and the daycare would not exceed the single-source significance thresholds.

Table 5. Construction and Operation Risk Impacts at the Off-Site Project MEI

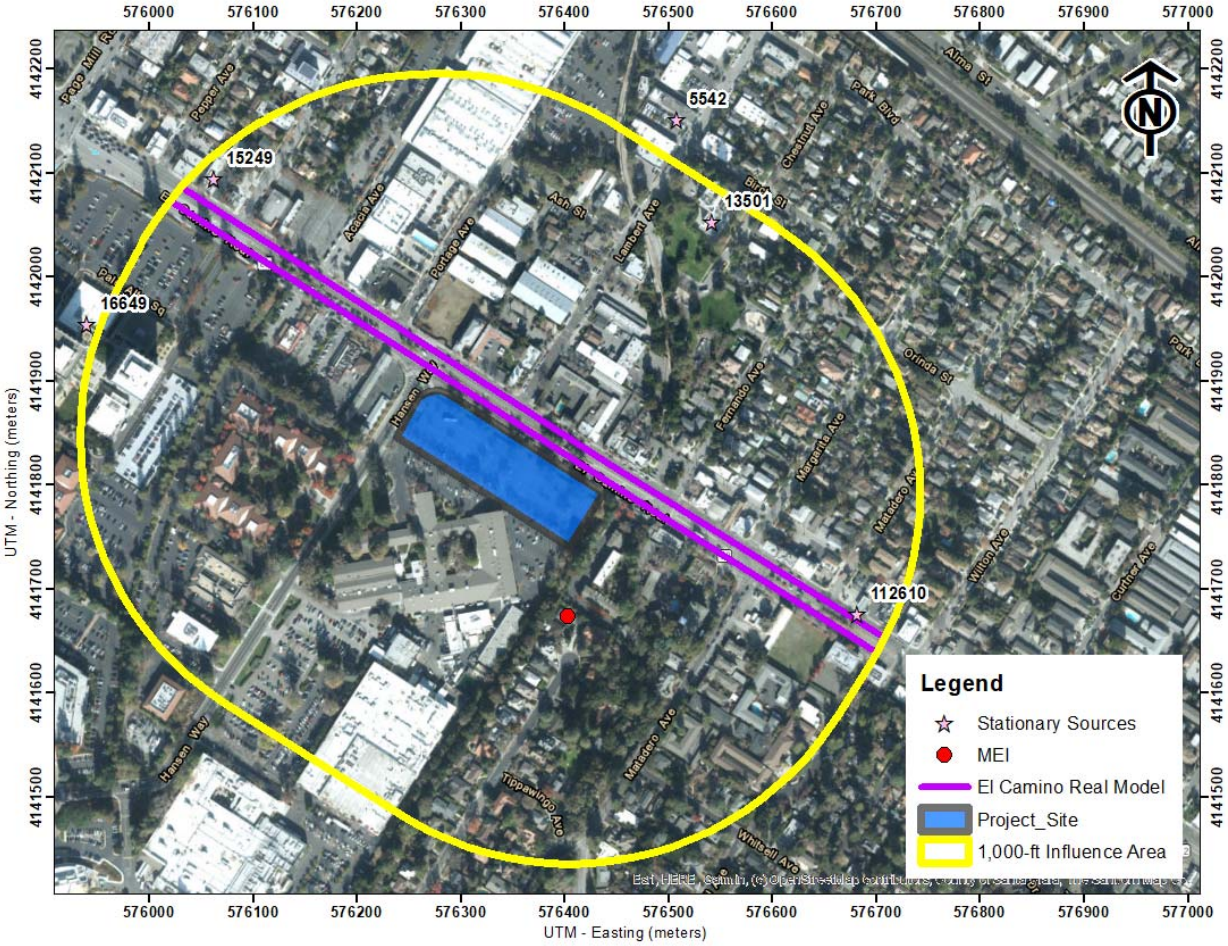
Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction (Years 0-1)	Unmitigated	8.32 (infant)	0.05	0.01
Project Generator Operation, One 500-kW, 670-HP (Years 1-30)		0.96 (infant)	<0.01	<0.01
Total/Maximum Project Impact (Years 0-30)	Unmitigated	9.28 (infant)	0.05	0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Most Affected Nearby School – Building Kidz of Palo Alto				
Project Construction (Years 0-1)	Unmitigated	0.46 (infant)	<0.01	<0.01
Project Generator (Years 1-5)		0.13 (infant)	<0.01	<0.01
Total/Maximum Project Impact (Years 0-5)	Unmitigated	0.59 (infant)	<0.01	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

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

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site (i.e., influence area). These sources include rail lines, highways, busy surface streets, and stationary sources identified by BAAQMD.

A review of the project area and provided traffic information indicated that one roadway within the influence area, El Camino Real, would have traffic exceeding 10,000 vehicles per day. A review of BAAQMD's stationary source geographic information systems (GIS) map tool identified five stationary sources with the potential to affect the MEI. Figure 2 shows the location of the sources affecting the MEI. Community risk impacts from these sources upon the MEI reported in Table 6. 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



Local Roadways – El Camino Real

A refined analysis of potential health impacts from vehicle traffic on El Camino Real was conducted. The refined analysis involved predicting emissions for the traffic volume and mix of vehicle types on the roadway near the project site and using an atmospheric dispersion model to predict exposure to TACs. The associated cancer risks are then computed based on the modeled exposures. *Attachment 1* includes a description of how community risk impacts, including cancer risk are computed.

Emission Rates

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on both roadways using the Caltrans version of the EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (e.g., TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. Inputs to the model include region (Santa Clara County),

type of road (major/collector), truck percentage for non-state highways in Santa Clara County (3.51 percent),[15] traffic mix assigned by CT-EMFAC2017 for the county, year of analysis (2021 – construction start year), and season (annual).

To estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating the increased cancer risks for sensitive receptors at the MEI and project site, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2021 (project construction 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 period that cancer risks are evaluated since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future.

The average daily traffic (ADT) for El Camino Real was calculated based on traffic data provided by the project's traffic consultant.[16] The estimated ADT on El Camino Real was 31,890 vehicles. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[17] which were then applied to the ADT volumes to obtain estimated hourly traffic volumes and emissions for the roadway. An average travel speed of 35 miles per hour (mph) on El Camino Real was used for all hours of the day based on posted speed limit signs on the roadway.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the EPA AERMOD air quality dispersion model.[18] TAC and $PM_{2.5}$ emissions from traffic on El Camino Real within 1,000 feet of the project site were evaluated. Vehicle traffic on the roadway was modeled using a series of adjacent volume sources along a line (line volume sources), with line segments used for the eastbound and westbound travel directions on El Camino Real. The same meteorological data and off-site sensitive receptors used in the previous dispersion modeling were used in the roadway modeling. Other inputs to the model included road geometry, hourly traffic emissions, and receptor locations. Annual TAC and $PM_{2.5}$ concentrations for 2021 from traffic on El Camino Real were calculated using the model. Concentrations were calculated at the project MEI with receptor heights of 5 feet (1.5 meters) to represent the breathing heights of residents in the home.

Figure 2 shows the roadway segments modeled and residential receptor locations used in the modeling. Table 6 lists the health risks from the roadway. The emission rates and roadway calculations used in the analysis are shown in *Attachment 5*.

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[15] 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

[16] Hexagon Transportation Consultants, Inc., *3300 El Camino Real Office Development Transportation Analysis*, May 26,2021.

[17] The Burden output from EMFAC2007, a previous version of CARB's EMFAC model, was used for this since the current web-based version of EMFAC2021 does not include Burden type output with hour by hour traffic volume information.

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

BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website,[19] 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. Five sources were identified using this tool, with one being a diesel generator, one being a gas dispensing facility, one being a diesel turbine, and two being auto body coatings. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided input and clarification about the stationary sources.[20] After further review, sources #15249 and #16649 had no measurable health risks and would, therefore, not impact the MEI.

The screening values provided by BAAQMD for the stationary sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Gasoline Dispending Facilities and Generic Equipment*. Community risk impacts from the stationary sources upon the MEI are reported in Table 6.

Summary of Cumulative Health Risk Impact at Construction MEI

Table 6 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e., the MEI). The project would not have any exceedances with respect to health risk caused by project activities, since the maximum unmitigated cancer risk, $PM_{2.5}$ concentration, and HI do not exceed the BAAQMD single-source thresholds. In addition, the unmitigated cancer risk, $PM_{2.5}$ concentration, and HI do not exceed their cumulative-source thresholds.

[19] BAAQMD, https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65
[20] Correspondence with Matthew Hanson, Environmental Planner, BAAQMD, May 3, 2021.

Table 6. Cumulative Community Risk Impacts at the Location of the Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Total/Maximum Project Impact	Unmitigated	9.28 (infant)	0.05	0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Cumulative Sources				
El Camino Real, ADT 31,890		3.72	0.14	<0.01
Arts Bodycraft Inc (Facility ID #5542, Auto Body Coating), MEI at +1,000 feet		-	-	<0.01
Pacific Bell (Facility ID #13501, Emergency Diesel Turbine), MEI at +1,000 feet		0.07	<0.01	<0.01
Barron Park Shell (Facility ID #112610, Gas Dispensing Facility), MEI at 900 feet		0.14	-	<0.01
Combined Sources	Unmitigated	13.21	<0.20	<0.05
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated	*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 EIR for the Comprehensive Plan Update has Mitigation Measure AIR-2a, which requires the implementation of the standard BAAQMD best management practices to control dust and exhaust during construction.

Required Comprehensive Plan Update EIR Mitigation Measure AIR-2a: **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 Comprehensive Plan Update EIR Mitigation Measure AIR-2a

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.

According to BAAQMD, health risks would be less than significant if the risks from the project are reduced below the single-source thresholds. While the project's impacts are below the single-source thresholds, the cancer risk is near its single-source threshold. By using construction equipment with U.S. EPA Tier 2 engine standards and Level 3 Diesel Particulate Filters (DPFs) or higher tiered engines, the cancer risk would be reduced.

Supporting Documentation

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

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

Attachment 3 includes the EMFAC2021 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

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

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

Attachment 1: Health Risk Calculation Methodology

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

Cancer Risk

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

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

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

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

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

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

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

Where:

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

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

Where:

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

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

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

Non-Cancer Hazards

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

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

Annual $PM_{2.5}$ Concentrations

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

Attachment 2: CalEEMod Modeling Inputs and Outputs

Air Quality/Noise Construction Information Data Request

Project Name: 3300 El Camino Real, Palo Altos, Ca.

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size

____	Dwelling Units	____ total project acres disturbed
____	s.f. residential	
____	s.f. retail	
52,872	s.f. office/commercial	
____	s.f. other, specify:	
____	s.f. parking garage	____ spaces
____	s.f. parking lot	____ spaces

Construction Hours 8:00 am to 4:30 pm

Pile Driving? Y/N?

Project include OPERATIONAL GENERATOR OR FIRE PUMP on-site? No.

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower:

Fuel Type:

Location in project (Plans Desired if Available):

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

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
	Demolition	**Start Date:**	**9/29/2021**	**Total phase:**	**10**			**Overall Import/Export Volumes**
		End Date:	**10/12/2021**					
	Concrete/Industrial Saws	81	0.73			0	0	**Demolition Volume**
2	Excavators	158	0.38	8	10	8	160	Square footage of buildings to be demolished: **Zero**
	Rubber-Tired Dozers	247	0.4			0	0	(*or* total tons to be hauled)
	Tractors/Loaders/Backhoes	97	0.37			0	0	__?__ square feet *or*
								?_ Hauling volume (tons)
								Any pavement demolished and hauled? _? 880 tons Ex. Asphalt)
	Site Preparation	**Start Date:**		**Total phase:**				
		End Date:						
	Graders	187	0.41			#DIV/0!	0	
	Rubber Tired Dozers	247	0.4			#DIV/0!	0	
	Tractors/Loaders/Backhoes	97	0.37			#DIV/0!	0	
	Grading / Excavation	**Start Date:**	**10/20/2021**	**Total phase:**	**43**			
		End Date:	**12/21/2021**					**Soil Hauling Volume**
2	Excavators	158	0.38	8	30	5.6	480	Export volume = _16,000 cubic yards?
1	Graders	187	0.41	4	25	2.3	100	Import volume = _0 cubic yards?
	Rubber Tired Dozers	247	0.4			0.0	0	
	Concrete/Industrial Saws	81	0.73			0.0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8	30	5.6	240	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**12/28/2021**	**Total phase:**	**10**			
		End Date:	**1/11/2022**					
1	Tractor/Loader/Backhoe	97	0.37	8	10	8	80	
	Excavators	158	0.38			0	0	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**2/10/2022**	**Total phase:**	**230**			**Cement Trucks? _450_ Total Round-Trips**
		End Date:	**12/28/2022**					
1	Cranes	231	0.29	8	60	2.1	480	Electric? (Y/N) _N_ Otherwise assumed diesel
1	Forklifts	89	0.2	8	180	6.3	1440	Liquid Propane (LPG)? (Y/N)
	Generator Sets	84	0.74			0.0	0	Or temporary line power? **Yes**
1	Tractors/Loaders/Backhoes	97	0.37	6	230	6.0	1380	
	Welders	46	0.45			0	0	
	Other Equipment?					0		
	Building - Interior/Architectural Coating	**Start Date:**	**8/18/2022**	**Total phase:**	**41**			
		End Date:	**10/28/2022**					
1	Air Compressors	78	0.48	8	41	8	328	
4	Aerial Lift	62	0.31	8	41	8	1312	
	Other Equipment?							
	Paving	**Start Date:**	**8/18/2022**	**Total phase:**	**88**			
		Start Date:	**12/15/2022**					
	Cement and Mortar Mixers	9	0.56			0	0	
1	Pavers	130	0.42	8	3	0.3	24	**Asphalt? 300 cubic yards or ____ round trips?**
1	Paving Equipment	132	0.36	8	3	0.3	24	
2	Rollers	80	0.38	8	5	0.5	80	
	Tractors/Loaders/Backhoes	97	0.37			0	0	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						

Equipment types listed in "Equipment Types" worksheet tab.

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

It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate

Modify horepower or load factor, as appropriate

Complete one sheet for each project component

Table 5
Project Trip Generation Estimates

Land Use	Size	Daily		AM Peak Hour				PM Peak Hour			
		Trip Rate	Trips	Trip Rate	Trips In	Trips Out	Trips Total	Trip Rate	Trips In	Trips Out	Trips Total
Office[1]	52,872 s.f.	9.74	515	1.16	52	9	61	1.15	10	51	61
Total Gross Project Trips			**515**		**52**	**9**	**61**		**10**	**51**	**61**

Notes:
All trip rates (in trips per 1,000 s.f.) are from *ITE Trip Generation Manual, 10th Edition*, 2017.
1. General Office (ITE Land Use 710): average trip rates were used.

Trip Distribution and Assignment

The trip distribution pattern for the project were estimated based on existing travel patterns on the surrounding roadway network and the locations of complementary land uses (see Figure 7). The peak-hour vehicle trips generated by the project were assigned to the roadway network in accordance with the trip distribution pattern and the locations of project driveways (see Figure 7).

The project would have two driveways. The driveway on Hansen Way would provide full access. El Camino Real has a raised median at the project driveway, so the driveway on El Camino Real would be limited to right turns in and out only. Inbound project traffic traveling northbound on El Camino Real would either make a left turn or U-turn at Hansen Way. Outbound project traffic at the El Camino Real driveway looking to travel northbound on El Camino Real would need to make a U-turn at Fernando Avenue. A tabular summary of project traffic at each study intersection is contained in Appendix C.

Traffic Volumes

Background Traffic Volumes

Background traffic volumes for the study intersections (see Figure 8) were estimated by adding to the existing traffic volumes the trips generated by nearby approved projects that have not been constructed or occupied.

Lists of approved projects were obtained from the City of Palo Alto website. Hexagon considered both the location and size of the approved projects in order to eliminate those that were too far away or too small to affect traffic conditions of the study intersections. The approved projects considered for the study are listed in Appendix E. Vehicle trips from the approved projects were obtained from the project's TIA or environmental document (initial study or EIR), if available. For projects without a traffic study, trip estimates were developed using rates published in the ITE *Trip Generation Manual*. The estimated trips were assigned to the study intersections according to distributions identified in the development traffic studies, if available, or knowledge of the study area.

The approved trips and traffic volumes for all components of traffic are tabulated in Appendix C.

Background Plus Project Traffic Volumes

Project trips were added to background traffic volumes to obtain background plus project traffic volumes (see Figure 9).

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	52.87	1000sqft	2.89	52,872.00	0
Enclosed Parking with Elevator	95.00	Space	0.00	38,000.00	0
Parking Lot	86.00	Space	0.00	34,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	City of Palo Alto Utilities Department				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Provided project land uses - project description

Construction Phase - Provided construction schedule

Off-road Equipment - Provided construction equip & hours

Off-road Equipment - Provided construction equip & hours

Off-road Equipment - Provided constructrion equipment and hours

Off-road Equipment - Provided construction equip & hours

Off-road Equipment - Provided construction equip & hours

Off-road Equipment - Provided construction equip & hours

Trips and VMT - 0 trips EMFAC2021, building const = 450 cement truck round trips, paving = 300-cy asphalt

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Demolition - pavement demo = 880 tons

Grading - grading = 16,000-cy export

Stationary Sources - Emergency Generators and Fire Pumps - one 500-kw, 670-hp diesel generator, 50 hrs/year

Construction Off-road Equipment Mitigation - BMPs, Tier 4 interim mitigation

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	6.00	43.00
tblConstructionPhase	NumDays	220.00	230.00
tblConstructionPhase	NumDays	10.00	41.00
tblConstructionPhase	NumDays	10.00	88.00
tblGrading	MaterialExported	0.00	16,000.00
tblLandUse	LandUseSquareFeet	52,870.00	52,872.00
tblLandUse	LotAcreage	1.21	2.89
tblLandUse	LotAcreage	0.86	0.00
tblLandUse	LotAcreage	0.77	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	2.10
tblOffRoadEquipment	UsageHours	7.00	6.30
tblOffRoadEquipment	UsageHours	8.00	0.00

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tblOffRoadEquipment	UsageHours	8.00	2.30
tblOffRoadEquipment	UsageHours	8.00	0.30
tblOffRoadEquipment	UsageHours	8.00	0.30
tblOffRoadEquipment	UsageHours	8.00	0.50
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	5.60
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	670.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripNumber	87.00	0.00
tblTripsAndVMT	HaulingTripNumber	2,000.00	0.00
tblTripsAndVMT	VendorTripNumber	21.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	47.00	0.00
tblTripsAndVMT	WorkerTripNumber	9.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0152	0.1553	0.1807	3.0000e-004	0.0136	7.2500e-003	0.0209	1.9200e-003	6.6700e-003	8.5900e-003	0.0000	26.4485	26.4485	8.5500e-003	0.0000	26.6623
2022	0.3371	0.4717	0.5198	8.4000e-004	0.0000	0.0236	0.0236	0.0000	0.0219	0.0219	0.0000	73.4717	73.4717	0.0220	0.0000	74.0207
Maximum	**0.3371**	**0.4717**	**0.5198**	**8.4000e-004**	**0.0136**	**0.0236**	**0.0236**	**1.9200e-003**	**0.0219**	**0.0219**	**0.0000**	**73.4717**	**73.4717**	**0.0220**	**0.0000**	**74.0207**

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	4.4000e-003	0.1252	0.2188	3.0000e-004	6.1200e-003	4.9000e-004	6.6100e-003	8.6000e-004	4.9000e-004	1.3600e-003	0.0000	26.4484	26.4484	8.5500e-003	0.0000	26.6623
2022	0.3084	0.3468	0.5835	8.4000e-004	0.0000	4.2800e-003	4.2800e-003	0.0000	4.2800e-003	4.2800e-003	0.0000	73.4716	73.4716	0.0220	0.0000	74.0206
Maximum	**0.3084**	**0.3468**	**0.5835**	**8.4000e-004**	**6.1200e-003**	**4.2800e-003**	**6.6100e-003**	**8.6000e-004**	**4.2800e-003**	**4.2800e-003**	**0.0000**	**73.4716**	**73.4716**	**0.0220**	**0.0000**	**74.0206**

	ROG	NOx	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	**11.23**	**24.72**	**-14.53**	**0.00**	**55.00**	**84.51**	**75.47**	**55.21**	**83.27**	**81.47**	**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)

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1	**9-29-2021**	**12-28-2021**	0.1642	0.1252
2	**12-29-2021**	**3-28-2022**	0.0675	0.0410
3	**3-29-2022**	**6-28-2022**	0.1149	0.0673
4	**6-29-2022**	**9-28-2022**	0.4016	0.3660
5	**9-29-2022**	**9-30-2022**	0.0162	0.0157
		Highest	0.4016	0.3660

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	0.2405	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003
Energy	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791
Mobile	0.1612	0.1800	1.5441	3.2000e-003	0.3442	2.2900e-003	0.3465	0.0919	2.1300e-003	0.0940	0.0000	298.2076	298.2076	0.0191	0.0140	302.8521
Stationary	0.0275	0.0768	0.0701	1.3000e-004		4.0400e-003	4.0400e-003		4.0400e-003	4.0400e-003	0.0000	12.7567	12.7567	1.7900e-003	0.0000	12.8014
Waste						0.0000	0.0000		0.0000	0.0000	9.9811	0.0000	9.9811	0.5899	0.0000	24.7277
Water						0.0000	0.0000		0.0000	0.0000	2.9812	0.0000	2.9812	0.3062	7.2300e-003	12.7905
Total	**0.4337**	**0.2988**	**1.6516**	**3.5800e-003**	**0.3442**	**9.5300e-003**	**0.3538**	**0.0919**	**9.3700e-003**	**0.1013**	**12.9622**	**356.6760**	**369.6383**	**0.9179**	**0.0221**	**399.1554**

Mitigated Operational

Date: 6/22/2021 12:24 PM

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2405	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003
Energy	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791
Mobile	0.1612	0.1800	1.5441	3.2000e-003	0.3442	2.2900e-003	0.3465	0.0919	2.1300e-003	0.0940	0.0000	298.2076	298.2076	0.0191	0.0140	302.8521
Stationary	0.0275	0.0768	0.0701	1.3000e-004		4.0400e-003	4.0400e-003		4.0400e-003	4.0400e-003	0.0000	12.7567	12.7567	1.7900e-003	0.0000	12.8014
Waste						0.0000	0.0000		0.0000	0.0000	9.9811	0.0000	9.9811	0.5899	0.0000	24.7277
Water						0.0000	0.0000		0.0000	0.0000	2.9812	0.0000	2.9812	0.3062	7.2300e-003	12.7905
Total	**0.4337**	**0.2988**	**1.6516**	**3.5800e-003**	**0.3442**	**9.5300e-003**	**0.3538**	**0.0919**	**9.3700e-003**	**0.1013**	**12.9622**	**356.6760**	**369.6383**	**0.9179**	**0.0221**	**399.1554**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/29/2021	10/12/2021	5	10	
2	Grading	Grading	10/20/2021	12/17/2021	5	43	
3	Trenching	Trenching	12/28/2021	1/10/2022	5	10	
4	Building Construction	Building Construction	2/10/2022	12/28/2022	5	230	

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5	Paving	Paving	8/18/2022	12/19/2022	5	88	
6	Architectural Coating	Architectural Coating	8/18/2022	10/13/2022	5	41	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.18

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 79,308; Non-Residential Outdoor: 26,436; Striped Parking Area: 4,344

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Excavators	2	8.00	158	0.38
Demolition	Rubber Tired Dozers	0	0.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Grading	Excavators	2	5.60	158	0.38
Grading	Graders	1	2.30	187	0.41
Grading	Rubber Tired Dozers	0	0.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	5.60	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	2.10	231	0.29
Building Construction	Forklifts	1	6.30	89	0.20
Building Construction	Generator Sets	0	0.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	4	8.00	63	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	1	0.30	130	0.42

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Paving	Paving Equipment	1	0.30	132	0.36
Paving	Rollers	2	0.50	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	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	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.4200e-003	0.0000	9.4200e-003	1.4300e-003	0.0000	1.4300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2900e-003	0.0215	0.0327	5.0000e-005		1.0400e-003	1.0400e-003		9.6000e-004	9.6000e-004	0.0000	4.5377	4.5377	1.4700e-003	0.0000	4.5744

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**2.2900e-003**	**0.0215**	**0.0327**	**5.0000e-005**	**9.4200e-003**	**1.0400e-003**	**0.0105**	**1.4300e-003**	**9.6000e-004**	**2.3900e-003**	**0.0000**	**4.5377**	**4.5377**	**1.4700e-003**	**0.0000**	**4.5744**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2400e-003	0.0000	4.2400e-003	6.4000e-004	0.0000	6.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4000e-004	0.0228	0.0392	5.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	4.5377	4.5377	1.4700e-003	0.0000	4.5744

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**6.4000e-004**	**0.0228**	**0.0392**	**5.0000e-005**	**4.2400e-003**	**8.0000e-005**	**4.3200e-003**	**6.4000e-004**	**8.0000e-005**	**7.2000e-004**	**0.0000**	**4.5377**	**4.5377**	**1.4700e-003**	**0.0000**	**4.5744**

Mitigated Construction Off-Site

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

3.3 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					4.1800e-003	0.0000	4.1800e-003	4.9000e-004	0.0000	4.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0125	0.1300	0.1434	2.4000e-004		5.9900e-003	5.9900e-003		5.5100e-003	5.5100e-003	0.0000	21.3649	21.3649	6.9100e-003	0.0000	21.5376

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Total	**0.0125**	**0.1300**	**0.1434**	**2.4000e-004**	**4.1800e-003**	**5.9900e-003**	**0.0102**	**4.9000e-004**	**5.5100e-003**	**6.0000e-003**	**0.0000**	**21.3649**	**21.3649**	**6.9100e-003**	**0.0000**	**21.5376**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8800e-003	0.0000	1.8800e-003	2.2000e-004	0.0000	2.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6300e-003	0.0997	0.1749	2.4000e-004		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	21.3648	21.3648	6.9100e-003	0.0000	21.5376

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**3.6300e-003**	**0.0997**	**0.1749**	**2.4000e-004**	**1.8800e-003**	**4.0000e-004**	**2.2800e-003**	**2.2000e-004**	**4.0000e-004**	**6.2000e-004**	**0.0000**	**21.3648**	**21.3648**	**6.9100e-003**	**0.0000**	**21.5376**

Mitigated Construction Off-Site

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

3.4 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	3.7000e-004	3.7900e-003	4.5200e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.1000e-004	2.1000e-004	0.0000	0.5459	0.5459	1.8000e-004	0.0000	0.5504
Total	**3.7000e-004**	**3.7900e-003**	**4.5200e-003**	**1.0000e-005**		**2.2000e-004**	**2.2000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**0.5459**	**0.5459**	**1.8000e-004**	**0.0000**	**0.5504**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4000e-004	2.7100e-003	4.6800e-003	1.0000e-005		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.5459	0.5459	1.8000e-004	0.0000	0.5504
Total	**1.4000e-004**	**2.7100e-003**	**4.6800e-003**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.5459**	**0.5459**	**1.8000e-004**	**0.0000**	**0.5504**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

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

3.4 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.9000e-004	5.0300e-003	6.7100e-003	1.0000e-005		2.7000e-004	2.7000e-004		2.5000e-004	2.5000e-004	0.0000	0.8198	0.8198	2.7000e-004	0.0000	0.8265
Total	**4.9000e-004**	**5.0300e-003**	**6.7100e-003**	**1.0000e-005**		**2.7000e-004**	**2.7000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.8198**	**0.8198**	**2.7000e-004**	**0.0000**	**0.8265**

Unmitigated Construction Off-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1000e-004	4.0600e-003	7.0300e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.8198	0.8198	2.7000e-004	0.0000	0.8265
Total	**2.1000e-004**	**4.0600e-003**	**7.0300e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.8198**	**0.8198**	**2.7000e-004**	**0.0000**	**0.8265**

Mitigated Construction Off-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0358	0.3664	0.3546	5.8000e-004		0.0194	0.0194		0.0178	0.0178	0.0000	51.0360	51.0360	0.0165	0.0000	51.4487
Total	**0.0358**	**0.3664**	**0.3546**	**5.8000e-004**		**0.0194**	**0.0194**		**0.0178**	**0.0178**	**0.0000**	**51.0360**	**51.0360**	**0.0165**	**0.0000**	**51.4487**

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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

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	0.0120	0.2237	0.3999	5.8000e-004		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	51.0360	51.0360	0.0165	0.0000	51.4486
Total	**0.0120**	**0.2237**	**0.3999**	**5.8000e-004**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**51.0360**	**51.0360**	**0.0165**	**0.0000**	**51.4486**

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					

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5500e-003	0.0158	0.0192	3.0000e-005		8.5000e-004	8.5000e-004		7.8000e-004	7.8000e-004	0.0000	2.5398	2.5398	8.2000e-004	0.0000	2.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5500e-003**	**0.0158**	**0.0192**	**3.0000e-005**		**8.5000e-004**	**8.5000e-004**		**7.8000e-004**	**7.8000e-004**	**0.0000**	**2.5398**	**2.5398**	**8.2000e-004**	**0.0000**	**2.5603**

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					

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0000e-004	0.0127	0.0219	3.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	2.5398	2.5398	8.2000e-004	0.0000	2.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0000e-004**	**0.0127**	**0.0219**	**3.0000e-005**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**2.5398**	**2.5398**	**8.2000e-004**	**0.0000**	**2.5603**

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					

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

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2908					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.5500e-003	0.0844	0.1393	2.2000e-004		3.0900e-003	3.0900e-003		3.0200e-003	3.0200e-003	0.0000	19.0761	19.0761	4.3700e-003	0.0000	19.1852
Total	**0.2994**	**0.0844**	**0.1393**	**2.2000e-004**		**3.0900e-003**	**3.0900e-003**		**3.0200e-003**	**3.0200e-003**	**0.0000**	**19.0761**	**19.0761**	**4.3700e-003**	**0.0000**	**19.1852**

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					

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2908					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8800e-003	0.1064	0.1546	2.2000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	19.0760	19.0760	4.3700e-003	0.0000	19.1852
Total	**0.2957**	**0.1064**	**0.1546**	**2.2000e-004**		**3.2700e-003**	**3.2700e-003**		**3.2700e-003**	**3.2700e-003**	**0.0000**	**19.0760**	**19.0760**	**4.3700e-003**	**0.0000**	**19.1852**

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					

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1612	0.1800	1.5441	3.2000e-003	0.3442	2.2900e-003	0.3465	0.0919	2.1300e-003	0.0940	0.0000	298.2076	298.2076	0.0191	0.0140	302.8521
Unmitigated	0.1612	0.1800	1.5441	3.2000e-003	0.3442	2.2900e-003	0.3465	0.0919	2.1300e-003	0.0940	0.0000	298.2076	298.2076	0.0191	0.0140	302.8521

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	514.95	116.84	37.01	931,533	931,533
Parking Lot	0.00	0.00	0.00		

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Total	514.95	116.84	37.01	931,533	931,533

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
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Parking Lot	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
Enclosed Parking with Elevator	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
General Office Building	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Parking Lot	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838

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

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NaturalGas Mitigated	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791
NaturalGas Unmitigated	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791

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					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	856526	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.6200e-003**	**0.0420**	**0.0353**	**2.5000e-004**		**3.1900e-003**	**3.1900e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**45.7075**	**45.7075**	**8.8000e-004**	**8.4000e-004**	**45.9791**

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					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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General Office Building	856526	4.6200e-003	0.0420	0.0353	2.5000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	45.7075	45.7075	8.8000e-004	8.4000e-004	45.9791
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.6200e-003**	**0.0420**	**0.0353**	**2.5000e-004**		**3.1900e-003**	**3.1900e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**45.7075**	**45.7075**	**8.8000e-004**	**8.4000e-004**	**45.9791**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	206720	0.0000	0.0000	0.0000	0.0000
General Office Building	907812	0.0000	0.0000	0.0000	0.0000
Parking Lot	12040	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			

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Enclosed Parking with Elevator	206720	0.0000	0.0000	0.0000	0.0000
General Office Building	907812	0.0000	0.0000	0.0000	0.0000
Parking Lot	12040	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	0.2405	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003
Unmitigated	0.2405	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003

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

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SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2112					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-004	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003
Total	**0.2405**	**2.0000e-005**	**2.1500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.1800e-003**	**4.1800e-003**	**1.0000e-005**	**0.0000**	**4.4500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2112					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-004	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1800e-003	4.1800e-003	1.0000e-005	0.0000	4.4500e-003
Total	**0.2405**	**2.0000e-005**	**2.1500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.1800e-003**	**4.1800e-003**	**1.0000e-005**	**0.0000**	**4.4500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.9812	0.3062	7.2300e-003	12.7905
Unmitigated	2.9812	0.3062	7.2300e-003	12.7905

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	9.39678 / 5.75932	2.9812	0.3062	7.2300e-003	12.7905
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.9812**	**0.3062**	**7.2300e-003**	**12.7905**

Mitigated

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	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	9.39678 / 5.75932	2.9812	0.3062	7.2300e-003	12.7905
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.9812**	**0.3062**	**7.2300e-003**	**12.7905**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.9811	0.5899	0.0000	24.7277
Unmitigated	9.9811	0.5899	0.0000	24.7277

8.2 Waste by Land Use

Date: 6/22/2021 12:24 PM

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Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	49.17	9.9811	0.5899	0.0000	24.7277
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**9.9811**	**0.5899**	**0.0000**	**24.7277**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	49.17	9.9811	0.5899	0.0000	24.7277
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**9.9811**	**0.5899**	**0.0000**	**24.7277**

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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
Emergency Generator	1	0	50	670	0.73	Diesel

Boilers

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

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (300 - 750 HP)	0.0275	0.0768	0.0701	1.3000e-004		4.0400e-003	4.0400e-003		4.0400e-003	4.0400e-003	0.0000	12.7567	12.7567	1.7900e-003	0.0000	12.8014
Total	**0.0275**	**0.0768**	**0.0701**	**1.3000e-004**		**4.0400e-003**	**4.0400e-003**		**4.0400e-003**	**4.0400e-003**	**0.0000**	**12.7567**	**12.7567**	**1.7900e-003**	**0.0000**	**12.8014**

11.0 Vegetation

Date: 6/22/2021 12:24 PM

3300 El Camino Real, Palo Alto - Santa Clara County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Attachment 3: 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	5	0	50	0	87	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	25	0	43.5
Grading	10	0	430	0	2000	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	215	0	1000
Trenching	3	0	30	0	0	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	15	0	0
Building Construction	47	21	10810	4830	900	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	5405	2415	450
Architectural Coating	9	0	369	0	0	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	184.5	0	0
Paving	10	0	880	0	18	0.5	0.5	0.5	LD_Mix	HDT_Mix	HHDT	440	0	9

Number of Days Per Year					
2021	9/29/21	12/31/21	94	67	
2022	1/1/22	12/28/22	362	259	
			456	**327**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	9/29/2021	10/12/2021	5	10
Grading	10/20/2021	12/17/2021	5	43
Trenching	12/28/2021	1/10/2022	5	10
Building Construction	2/10/2022	12/28/2022	5	230
Architectural Coating	8/18/2022	10/13/2022	5	41
Paving	8/18/2022	12/19/2022	5	88

Summary of Construction Traffic Emissions (EMFAC2021)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2	CH4	N2O	CO2e
					Tons							*Metric Tons*		
Toxic Air Contaminants (0.5 Mile Trip Length)														
2021	0.0034	0.0153	0.0185	0.0000	0.0007	0.0002	0.0009	0.0001	0.0001	0.0002	3.3261	0.0012	0.0005	3.5192
2022	0.0124	0.0575	0.0695	0.0001	0.0027	0.0007	0.0033	0.0004	0.0003	0.0007	12.4821	0.0041	0.0020	13.1893

Source: EMFAC2021 (v1.0.1) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Con	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PM	PM2.5_PM	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PM	PM10_PMI	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTST	ROG_RUNL	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTST	TOG_RUNL	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Santa Clara	2021	HHDT	Aggregate	Aggregate	Gasoline	4.911671	108.3321	108.3321	0	98.2727	0	12.52129	0	1.17477	0.00724	0	0.001773	0.005	0.038424	0.007874	0	0.001929	0.02	0.109784	2565.57	0	49.38815	0.549631	0	0.000108	0.290212	0	0.031064	3.502409	0	0.00059	0.16728	1.506995	11.25307	5.110707	0	0.000646	0.16728	1.506995	11.25307	0.037857	118.2833	0	0.353757	0.025363	0	0.000488
Santa Clara	2021	HHDT	Aggregate	Aggregate	Diesel	7945.653	974275.6	974275.6	0	115958.9	0	2.842904	68.7602	2.347489	0.03733	0.061163	0	0.008769	0.028367	0.039018	0.063929	0	0.035076	0.081048	1695.883	12693.22	0	0.002265	0.236268	0	0.267187	1.999821	0	0.048759	5.086789	0	0	0	0	0.055509	5.790922	0	0	0	0	0	0.19614	0.195075	67.59912	0	0.016059	0.120197	0
Santa Clara	2021	HHDT	Aggregate	Aggregate	Natural Ga	604.4858	44859.32	44859.32	0	5247.791	0	1.479487	13.79137	0	0.002003	0.021244	0	0.009	0.047481	0.002179	0.023105	0	0.036	0.13566	1449.478	10245.18	0	2.851947	36.48951	0	0.295486	2.088546	0	0.068879	0.577467	0	0	0	0	2.94267	37.30415	0	0	0	0	0	0.853048	15.08309	73.72785	0	0	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Gasoline	606788	22328684	22328684	0	2819031	0	0.061526	0	0.306099	0.001307	0	0.002137	0.002	0.002656	0.001421	0	0.002324	0.008	0.007589	291.5075	0	74.80132	0.003309	0	0.086516	0.005874	0	0.036086	0.013455	0	0.413042	0.102567	0.258475	1.575398	0.019625	0	0.452227	0.102567	0.258475	1.575398	0.031893	0.916686	0	3.92511	0.002882	0	0.000739
Santa Clara	2021	LDA	Aggregate	Aggregate	Diesel	2097.285	65438.93	65438.93	0	9106.701	0	0.289351	0	0	0.021136	0	0	0.002	0.002681	0.022092	0	0	0.008	0.007659	237.7247	0	0	0.00159	0	0	0.037454	0	0	0.034231	0	0	0	0	0	0.03897	0	0	0	0	0	0.0031	0.362693	0	0	0.002253	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Electricity	45687.59	1848394	0	1848394	228454	713632.8	0	0	0	0	0	0	0.002	0.001529	0	0	0	0.008	0.00437	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Plug-in Hyb	12325.75	549262.6	292344.2	256918.4	50966.97	77597.02	0.003493	0	0.11551	0.000782	0	0.002436	0.002	0.001363	0.00085	0	0.002649	0.008	0.003895	148.3928	0	67.90667	0.00048	0	0.042861	0.00064	0	0.021155	0.00151	0	0.173285	0.039575	0.034683	0.463886	0.002204	0	0.189725	0.039575	0.034683	0.463886	0.01985	0.228959	0	1.339893	0.001467	0	0.000671
Santa Clara	2021	LDT1	Aggregate	Aggregate	Gasoline	56250.2	1810349	1810349	0	251042.1	0	0.178236	0	0.45509	0.002102	0	0.003187	0.002	0.003233	0.002285	0	0.003465	0.008	0.009237	342.3532	0	92.17037	0.008673	0	0.128174	0.012178	0	0.042157	0.039434	0	0.681062	0.191773	0.56032	3.038222	0.057483	0	0.745671	0.191773	0.56032	3.038222	0.035289	1.855747	0	6.610145	0.003385	0	0.000911
Santa Clara	2021	LDT1	Aggregate	Aggregate	Diesel	32.08333	503.0685	503.0685	0	96.14776	0	1.666847	0	0	0.24162	0	0	0.002	0.003734	0.252545	0	0	0.008	0.010668	415.5911	0	0	0.014019	0	0	0.065477	0	0	0.301811	0	0	0	0	0	0.343592	0	0	0	0	0	0.0031	1.617036	0	0	0.003938	0	0
Santa Clara	2021	LDT1	Aggregate	Aggregate	Electricity	176.8774	5945.758	0	5945.758	835.4181	2295.553	0	0	0	0	0	0	0.002	0.001541	0	0	0	0.008	0.004403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDT1	Aggregate	Aggregate	Plug-in Hyb	10.82472	516.8071	263.2288	253.5783	44.7602	76.5882	0.003342	0	0.11551	0.000498	0	0.001651	0.002	0.001365	0.000541	0	0.001795	0.008	0.0039	142.0049	0	74.72169	0.000461	0	0.043003	0.000616	0	0.021287	0.001445	0	0.173285	0.026876	0.026052	0.339589	0.021392	0.219103	0	0.189725	0.026876	0.026052	0.339589	0.021392	0.219103	0	1.339893	0.001404	0	0.000739
Santa Clara	2021	LDT2	Aggregate	Aggregate	Gasoline	269286.1	9644865	9644865	0	1261291	0	0.099372	0	0.421535	0.001357	0	0.002117	0.002	0.003124	0.001476	0	0.002303	0.008	0.008925	364.8211	0	94.21995	0.003765	0	0.098308	0.007574	0	0.041886	0.015421	0	0.472046	0.091479	0.236284	1.467935	0.023495	0	0.51683	0.091479	0.236284	1.467935	0.033775	1.034906	0	4.394297	0.003607	0	0.000931
Santa Clara	2021	LDT2	Aggregate	Aggregate	Diesel	883.652	33892.89	33892.89	0	4258.527	0	0.053343	0	0	0.00583	0	0	0.002	0.003073	0.006094	0	0	0.008	0.00878	323.8235	0	0	0.000676	0	0	0.051019	0	0	0.01456	0	0	0	0	0	0.016576	0	0	0	0	0	0.0031	0.133207	0	0	0.003068	0	0
Santa Clara	2021	LDT2	Aggregate	Aggregate	Electricity	295.5134	10300.33	0	10300.33	1512.362	3976.778	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDT2	Aggregate	Aggregate	Plug-in Hyb	845.8398	39165.03	20268.11	18896.92	3497.547	5707.433	0.003396	0	0.11551	0.000672	0	0.002194	0.002	0.001364	0.000731	0	0.002386	0.008	0.003897	144.2823	0	81.05617	0.000467	0	0.042925	0.000624	0	0.021215	0.001468	0	0.173285	0.027973	0.027304	0.362073	0.002143	0	0.189725	0.027973	0.027304	0.362073	0.021638	0.222617	0	1.339893	0.001426	0	0.000801
Santa Clara	2021	LHDT1	Aggregate	Aggregate	Gasoline	18933.42	672783.1	672783.1	0	282079.8	0	0.256798	0.039718	0.701068	0.001752	0	0.000385	0.002	0.0273	0.001905	0	0.000418	0.008	0.078	931.4507	122.4688	25.83191	0.012061	0.120812	0.03785	0.014272	0.003066	0.053341	0.061014	0.454849	0.191678	0.056457	0.299122	3.116304	0.089031	0.663714	0.209863	0.056457	0.299122	3.116304	0.044832	1.411296	3.747334	2.989075	0.009208	0.001211	0.000255
Santa Clara	2021	LHDT1	Aggregate	Aggregate	Diesel	9139.777	343382.9	343382.9	0	114966.9	0	2.358079	2.271347	0	0.04683	0.027404	0	0.003	0.0273	0.048947	0.028643	0	0.012	0.078	643.496	136.5842	0	0.010209	0.005098	0	0.101383	0.021519	0	0.219784	0.10976	0	0	0	0	0.25021	0.124954	0	0	0	0	0	0.146324	0.639056	0.909745	0	0.006097	0.001294	0
Santa Clara	2021	LHDT2	Aggregate	Aggregate	Gasoline	2466	87553.14	87553.14	0	36739.72	0	0.242157	0.039344	0.681173	0.001604	0	0.000316	0.002	0.03185	0.001745	0	0.000344	0.008	0.091	1035.79	141.0887	26.12054	0.009565	0.120729	0.036622	0.013821	0.003071	0.05226	0.045738	0.450754	0.183893	0.052329	0.275873	2.879115	0.066741	0.657739	0.20134	0.052329	0.275873	2.879115	0.044945	1.150578	3.751518	3.098774	0.01024	0.001395	0.000258
Santa Clara	2021	LHDT2	Aggregate	Aggregate	Diesel	4074.911	157442.8	157442.8	0	51257.26	0	1.819669	2.235115	0	0.039933	0.027151	0	0.003	0.03185	0.044738	0.028379	0	0.012	0.091	781.4731	217.5251	0	0.008888	0.005098	0	0.123121	0.034271	0	0.191344	0.10976	0	0	0	0	0.217833	0.124954	0	0	0	0	0	0.165331	0.517738	0.909745	0	0.007405	0.002061	0
Santa Clara	2021	MCY	Aggregate	Aggregate	Gasoline	27304.17	1603822.2	160382.2	0	54608.34	0	0.626062	0	0.157064	0.001755	0	0.003626	0.001	0.0042	0.001872	0	0.003843	0.004	0.012	189.7631	0	52.22767	0.180174	0	0.199348	0.041922	0	0.009146	1.214328	0	1.494194	3.559817	3.717016	3.986797	1.441721	0	1.623911	3.559817	3.717016	3.986797	0.008645	14.15601	0	8.172263	0.001876	0	0.000516
Santa Clara	2021	MDV	Aggregate	Aggregate	Gasoline	147596.4	5051242	5051242	0	682293.7	0	0.160894	0	0.57169	0.001434	0	0.002382	0.002	0.003201	0.001559	0	0.002589	0.008	0.009147	442.5348	0	114.8138	0.005886	0	0.129321	0.010684	0	0.047954	0.026856	0	0.67693	0.1118	0.299795	1.785601	0.038387	0	0.741109	0.1118	0.299795	1.785601	0.033755	1.329778	0	5.04226	0.004375	0	0.001135
Santa Clara	2021	MDV	Aggregate	Aggregate	Diesel	2291.714	86017.73	86017.73	0	11013.96	0	0.063349	0	0	0.005706	0	0	0.002	0.00312	0.005964	0	0	0.008	0.008916	420.7053	0	0	0.000573	0	0	0.066282	0	0	0.012335	0	0	0	0	0	0.014043	0	0	0	0	0	0.0031	0.203492	0	0	0.003986	0	0
Santa Clara	2021	MDV	Aggregate	Aggregate	Electricity	256.699	9069.305	0	9069.305	1316.884	3501.5	0	0	0	0	0	0	0.002	0.001522	0	0	0	0.008	0.004349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	MDV	Aggregate	Aggregate	Plug-in Hyb	609.3868	26030.39	13830.97	12199.42	2519.814	3684.588	0.003487	0	0.11551	0.000845	0	0.002679	0.002	0.001363	0.00092	0	0.002914	0.008	0.003894	148.1394	0	101.4945	0.000477	0	0.042643	0.000633	0	0.020952	0.001508	0	0.173285	0.030476	0.030968	0.408082	0.0022	0	0.189725	0.030476	0.030968	0.408082	0.022316	0.228568	0	1.339893	0.001465	0	0.001003
Santa Clara	2021	MH	Aggregate	Aggregate	Gasoline	2769.699	23630.01	23630.01	0	627.6675	0	0.395766	0.002059	0	0.000494	0	0	0.003	0.015756	0.002239	0	0.000538	0.012	0.045017	1950.365	0	32.39866	0.025366	0	0.038961	0.034003	0	0.039426	0.120744	0	0.173868	15.32954	0.341293	5.193314	0.176189	0	0.190364	15.32954	0.341293	5.193314	0.044424	3.344602	0	3.937518	0.019281	0	0.00032
Santa Clara	2021	MH	Aggregate	Aggregate	Diesel	922.1828	8933.632	8933.632	0	92.21828	0	4.615076	0	0	0.111614	0	0	0.004	0.015675	0.116661	0	0	0.016	0.044785	1080.28	0	0	0.00602	0	0	0.170198	0	0	0.129617	0	0	0	0	0	0.14756	0	0	0	0	0	0.137198	0.438429	0	0	0.010236	0	0
Santa Clara	2021	MHDT	Aggregate	Aggregate	Gasoline	1442.735	67829.47	67829.47	0	28866.25	0	0.831489	0.087806	0.473646	0.001493	0	0.000635	0.003	0.015756	0.001624	0	0.00069	0.012	0.045017	1848.545	547.8914	49.28763	0.027494	0.244939	0.052883	0.036408	0.006525	0.031617	0.14124	1.002561	0.308525	0.045168	0.369912	3.607527	0.206097	1.462934	0.337796	0.045168	0.369912	3.607527	0.044883	3.016915	14.99869	6.909591	0.018275	0.005416	0.000487
Santa Clara	2021	MHDT	Aggregate	Aggregate	Diesel	10153.19	424633.4	424633.4	0	120691.4	0	1.894718	16.09448	1.444966	0.024213	0.051093	0	0.003	0.015941	0.025308	0.053403	0	0.012	0.045546	1160.391	2338.117	0	0.002807	0.014388	0	0.18282	0.368371	0	0.060425	0.309775	0	0	0	0	0.068789	0.352655	0	0	0	0	0	0.192868	0.190198	7.288171	0	0.010988	0.022141	0
Santa Clara	2021	MHDT	Aggregate	Aggregate	Natural Ga	78.33433	3644.537	3644.537	0	742.0488	0	0.168911	6.475626	0	0.000993	0.01576	0	0.003	0.016009	0.00108	0.01714	0	0.012	0.04574	1007.079	5194.634	0	0.721288	18.08715	0	0.2053	1.05896	0	0.010306	0.25843	0	0	0	0	0.736127	18.45926	0	0	0	0	0	1.06	2.987554	29.49823	0	0	0	0
Santa Clara	2021	OBUS	Aggregate	Aggregate	Gasoline	483.6838	22502.68	22502.68	0	9677.546	0	0.647154	0.064946	0.407221	0.000833	0	0.00026	0.003	0.01568	0.000906	0	0.000283	0.012	0.044799	1824.237	386.5099	32.42022	0.018667	0.194146	0.037204	0.030004	0.005187	0.030554	0.092334	0.744545	0.197731	0.034167	0.138331	2.476771	0.134734	1.086438	0.21649	0.034167	0.138331	2.476771	0.0449	2.094066	5.764227	4.193973	0.018034	0.003821	0.000321
Santa Clara	2021	OBUS	Aggregate	Aggregate	Diesel	834.688	61084.28	61084.28	0	8576.673	0	1.576242	9.183516	1.420449	0.027062	0.016448	0	0.003	0.018131	0.028286	0.017191	0	0.012	0.051804	1290.86	1635.121	0	0.003027	0.022612	0	0.203376	0.257614	0	0.065176	0.48683	0	0	0	0	0.074198	0.554219	0	0	0	0	0	0.206149	0.214603	7.255191	0	0.012224	0.015484	0
Santa Clara	2021	OBUS	Aggregate	Aggregate	Natural Ga	5.469371	354.9737	354.9737	0	48.6774	0	0.296201	1.581355	0	0.000557	0.002851	0	0.003	0.016148	0.000605	0.003101	0	0.012	0.046137	1044.502	1172.359	0	0.731981	4.779418	0	0.212928	0.238993	0	0.010459	0.068288	0	0	0	0	0.74704	4.877746	0	0	0	0	0	1.06	3.098562	4.989923	0	0	0	0
Santa Clara	2021	SBUS	Aggregate	Aggregate	Gasoline	153.6367	7565.4	7565.4	0	614.5466	0	0.533764	0.925451	0.67372	0.000841	0	0.00054	0.002	0.015721	0.000915	0	0.000587	0.008	0.044917	825.4164	2631.972	59.70541	0.013058	2.453844	0.074718	0.028424	0.08626	0.062288	0.063594	10.62574	0.427027	0.104098	0.223574	1.381476	0.092797	15.50505	0.467541	0.104098	0.223574	1.381476	0.045	1.630235	82.14507	10.90196	0.00816	0.02602	0.00059
Santa Clara	2021	SBUS	Aggregate	Aggregate	Diesel	657.6731	15431.13	15431.13	0	9523.107	0	4.438199	23.32594	0.434289	0.023358	0.024671	0	0.003	0.015721	0.024414	0.025786	0	0.012	0.044917	1157.296	2254.332	0	0.00292	0.008308	0	0.182332	0.355171	0	0.06286	0.178878	0	0	0	0	0.071561	0.203639	0	0	0	0	0	0.136384	0.189608	4.398329	0	0.010959	0.021347	0
Santa Clara	2021	SBUS	Aggregate	Aggregate	Natural Ga	21.69727	560.9301	560.9301	0	314.1765	0	0.631341	5.309646	0	0.003378	0.010433	0	0.003	0.015721	0.003674	0.011347	0	0.012	0.044917	1293.196	4040.723	0	3.611806	15.73509	0	0.263627	0.823728	0	0.051606	0.224823	0	0	0	0	3.686113	16.05882	0	0	0	0	0	1.06	12.47317	18.66291	0	0	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Gasoline	45.675	4769.83	4769.83	0	182.7	0	0.032133	0	0.568854	0.000898	0	8.87E-05	0.002	0.03185	0.000977	0	9.64E-05	0.008	0.091	974.9499	0	38.39745	0.002378	0	0.0539	0.00477	0	0.08329	0.006763	0	0.198578	0.052994	0.093754	0.610126	0.009869	0	0.217418	0.052994	0.093754	0.610126	0.045	0.578479	0	5.701642	0.009638	0	0.000038
Santa Clara	2021	UBUS	Aggregate	Aggregate	Diesel	434.6269	48602.56	48602.56	0	1738.508	0	0.386258	0	0	0.007023	0	0	0.0083	0.0385	0.00734	0	0	0.033201	0.11	1100.519	0	0	0.003215	0	0	0.173387	0	0	0.069208	0	0	0	0	0	0.078788	0	0	0	0	0	0.1877	0.079368	0	0	0.010428	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0	199.0027	20.18703	346.9103	0	0	0	0	0	0	0.009	0.01925	0	0	0	0.036	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Natural Ga	41.43636	4737.889	4737.889	0	165.7455	0	0.058764	0	0	0.000282	0	0	0.00818	0.0385	0.000295	0	0	0.032718	0.11	1298.95	0	0	4.245038	0	0	0.264799	0	0	0.060653	0	0	0	0	0	4.332372	0	0	0	0	0	0.97	49.03001	0	0	0	0	0

Source: EMFAC2021 (v1.0.1) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Con	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PM	PM2.5_PM	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PM	PM10_PMI	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNI	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNI	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNI	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Santa Clara	2022	HHDT	Aggregate	Aggregate	Gasoline	3.827367	105.1913	105.1913	0	76.57795	0	9.246272	0	1.235102	0.00578	0	0.001696	0.005	0.036521	0.006286	0	0.001845	0.02	0.104346	2407.176	0	49.64979	0.419155	0	0.000162	0.231899	0	0.038678	2.628217	0	0.000881	0.16301	1.46846	10.96573	3.835087	0	0.000965	0.16301	1.46846	10.96573	0.039703	94.77398	0	0.712144	0.023797	0	0.000491
Santa Clara	2022	HHDT	Aggregate	Aggregate	Diesel	8126.63	984491.3	984491.3	0	118998.6	0	2.444518	67.79787	2.544846	0.027272	0.034513	0	0.008769	0.027987	0.028505	0.036074	0	0.035077	0.079962	1677.544	12677.87	0	0.001458	0.236832	0	0.264298	1.997403	0	0.031398	5.098937	0	0	0	0	0.035744	5.804752	0	0	0	0	0	0.203666	0.125232	70.47019	0	0.015885	0.120052	0
Santa Clara	2022	HHDT	Aggregate	Natural Ga	Aggregate	660.7756	47681.36	47681.36	0	5809.397	0	1.356717	13.62116	0	0.001899	0.022358	0	0.009	0.047596	0.002065	0.024316	0	0.036	0.135989	1429.3	10316.77	0	2.688526	36.13158	0	0.291372	2.10314	0	0.062535	0.56302	0	0	0	0	2.77132	36.92822	0	0	0	0	0	0.851705	14.53027	73.87982	0	0	0	0
Santa Clara	2022	LDA	Aggregate	Aggregate	Gasoline	604047.8	22374250	22374250	0	2805661	0	0.053791	0	0.287921	0.00126	0	0.002062	0.002	0.002656	0.00137	0	0.002242	0.008	0.007588	287.1374	0	73.33113	0.002925	0	0.081262	0.005394	0	0.035089	0.011654	0	0.381731	0.098272	0.249754	1.530333	0.017001	0	0.417946	0.098272	0.249754	1.530333	0.032827	0.847106	0	3.666246	0.002839	0	0.000725
Santa Clara	2022	LDA	Aggregate	Aggregate	Diesel	1988.847	60930.09	60930.09	0	8564.495	0	0.263546	0	0	0.019976	0	0	0.002	0.00269	0.020879	0	0	0.008	0.007686	236.272	0	0	0.00151	0	0	0.037225	0	0	0.032513	0	0	0	0	0	0.037014	0	0	0	0	0	0	0.0031	0.352928	0	0	0.002239	0	0
Santa Clara	2022	LDA	Aggregate	Electricity	Aggregate	49768.56	2058456	0	2058456	294733.9	794733.9	0	0	0	0	0	0	0.002	0.001531	0	0	0	0.008	0.004374	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2022	LDA	Aggregate	Aggregate	Plug-in Hyb	14080.33	626833.5	326494.8	300338.7	58222.18	90711.24	0.003418	0	0.11551	0.000718	0	0.002292	0.002	0.001368	0.000781	0	0.002492	0.008	0.003908	145.2228	0	67.22203	0.000469	0	0.042745	0.000623	0	0.021047	0.001478	0	0.173285	0.039673	0.035067	0.451466	0.002157	0	0.189725	0.039673	0.035067	0.451466	0.019838	0.224082	0	1.339893	0.001436	0	0.000665
Santa Clara	2022	LDT1	Aggregate	Aggregate	Gasoline	54974.08	1779154	1779154	0	245182.1	0	0.160037	0	0.042895	0.001971	0	0.003006	0.002	0.003236	0.002144	0	0.003269	0.008	0.009246	338.1243	0	90.32061	0.007798	0	0.120165	0.011179	0	0.040992	0.03517	0	0.630523	0.182138	0.532387	2.932213	0.035502	1.699209	0	6.111696	0.003343	0	0.000893
Santa Clara	2022	LDT1	Aggregate	Diesel	Aggregate	28.88602	444.5778	444.5778	0	84.95747	0	1.664076	0	0	0.241157	0	0	0.002	0.003731	0.252061	0	0	0.008	0.01066	415.6618	0	0	0.013984	0	0	0.065488	0	0	0.301058	0	0	0	0	0	0.342735	0	0	0	0	0	0	0.0031	1.609282	0	0	0.003939	0	0
Santa Clara	2022	LDT1	Aggregate	Aggregate	Electricity	182.9928	6367.047	0	6367.047	860.9347	2458.206	0	0	0	0	0	0	0.002	0.001541	0	0	0	0.008	0.004403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2022	LDT1	Aggregate	Aggregate	Plug-in Hyb	24.31577	1158.953	555.2268	603.7259	100.5457	182.3432	0.003144	0	0.11551	0.00042	0	0.001472	0.002	0.001376	0.000457	0	0.001601	0.008	0.003931	133.572	0	73.48077	0.00043	0	0.042675	0.000571	0	0.020981	0.001359	0	0.173285	0.025111	0.023155	0.300675	0.020121	0.206104	0	1.339893	0.00132	0	0.000726
Santa Clara	2022	LDT2	Aggregate	Aggregate	Gasoline	274728.5	9911730	9911730	0	1286654	0	0.087216	0	0.387125	0.001308	0	0.002055	0.002	0.003124	0.001422	0	0.002235	0.008	0.008926	357.8859	0	92.09899	0.003418	0	0.092802	0.006919	0	0.046202	0.013801	0	0.439671	0.088088	0.231141	1.442564	0.020134	0	0.481384	0.088088	0.231141	1.442564	0.034673	0.960886	0	4.129331	0.003538	0	0.00091
Santa Clara	2022	LDT2	Aggregate	Aggregate	Diesel	933.788	35569.23	35569.23	0	4479.453	0	0.049482	0	0	0.005617	0	0	0.002	0.003089	0.005871	0	0	0.008	0.008825	319.8313	0	0	0.000662	0	0	0.05039	0	0	0.01425	0	0	0	0	0	0.016223	0	0	0	0	0	0	0.0031	0.132603	0	0	0.003031	0	0
Santa Clara	2022	LDT2	Aggregate	Aggregate	Electricity	669.3585	23693.95	0	23693.95	3436.204	9147.819	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004354	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2022	LDT2	Aggregate	Aggregate	Plug-in Hyb	1256.28	57825.99	28723.51	29102.47	5194.718	8789.814	0.003259	0	0.11551	0.000565	0	0.001911	0.002	0.001372	0.000614	0	0.002078	0.008	0.00392	138.4921	0	79.93529	0.000446	0	0.042681	0.000592	0	0.020988	0.00141	0	0.173285	0.026873	0.02547	0.333582	0.020057	0	0.189725	0.026873	0.02547	0.333582	0.020799	0.213696	0	1.339893	0.001369	0	0.00079
Santa Clara	2022	LHDT1	Aggregate	Aggregate	Gasoline	19023.54	692949.2	692949.2	0	283422.4	0	0.22563	0.03858	0.680855	0.001666	0	0.000355	0.002	0.0273	0.001812	0	0.000386	0.008	0.078	910.666	121.4496	25.8752	0.010696	0.11838	0.036173	0.012587	0.003045	0.052713	0.053941	0.441903	0.181796	0.053097	0.287419	3.005479	0.078711	0.644824	0.189044	0.053097	0.287419	3.005479	0.044851	1.310703	3.750518	3.032062	0.009003	0.001201	0.000256
Santa Clara	2022	LHDT1	Aggregate	Diesel	Aggregate	9466.897	364941.3	364941.3	0	119081.7	0	2.046185	2.148991	0	0.042212	0.027161	0	0.003	0.0273	0.044121	0.028389	0	0.012	0.078	640.1321	134.8074	0	0.009365	0.005098	0	0.100853	0.021239	0	0.201618	0.10976	0	0	0	0	0.229529	0.124954	0	0	0	0	0	0.156672	0.574472	0.909745	0	0.006066	0.001277	0
Santa Clara	2022	LHDT2	Aggregate	Aggregate	Gasoline	2479.119	89333.8	89333.8	0	36935.18	0	0.214022	0.038116	0.662237	0.001522	0	0.000288	0.002	0.03185	0.001655	0	0.000313	0.008	0.091	1017.016	140.0339	25.93331	0.008303	0.117781	0.035049	0.012366	0.003023	0.05141	0.03933	0.436803	0.174741	0.049582	0.263161	2.773988	0.057391	0.637382	0.19132	0.049582	0.263161	2.773988	0.044954	1.055116	3.755463	3.106689	0.010054	0.001384	0.000256
Santa Clara	2022	LHDT2	Aggregate	Aggregate	Diesel	4276.175	167672	167672	0	53788.9	0	1.602621	2.114348	0	0.036809	0.027077	0	0.003	0.03185	0.038473	0.028302	0	0.012	0.091	773.4619	214.911	0	0.00832	0.005098	0	0.121859	0.033859	0	0.179126	0.10976	0	0	0	0	0.203923	0.124954	0	0	0	0	0	0.1727	0.476085	0.909745	0	0.007329	0.002036	0
Santa Clara	2022	MCY	Aggregate	Aggregate	Gasoline	27595.09	162924	162924	0	55190.18	0	0.60517	0	0.149724	0.001772	0	0.003556	0.001	0.0042	0.001891	0	0.003773	0.004	0.012	188.9834	0	50.90901	0.173457	0	0.19335	0.041009	0	0.008761	1.156556	0	1.442993	3.560376	3.734124	3.980024	1.378949	0	1.568432	3.560376	3.734124	3.980024	0.008705	13.58248	0	8.107621	0.001868	0	0.000503
Santa Clara	2022	MDV	Aggregate	Aggregate	Gasoline	150747.3	5216512	5216512	0	697659.3	0	0.136769	0	0.517519	0.001357	0	0.002255	0.002	0.003193	0.001475	0	0.002452	0.008	0.009123	434.2294	0	112.1929	0.005018	0	0.119363	0.009481	0	0.045397	0.021781	0	0.614579	0.106179	0.293735	1.762049	0.031733	0	0.672881	0.106179	0.293735	1.762049	0.034617	1.174347	0	4.66825	0.004293	0	0.001109
Santa Clara	2022	MDV	Aggregate	Aggregate	Diesel	2337.328	86668.85	86668.85	0	11158.46	0	0.05815	0	0	0.005454	0	0	0.002	0.003153	0.0057	0	0	0.008	0.009009	417.1884	0	0	0.000553	0	0	0.065728	0	0	0.011906	0	0	0	0	0	0.013554	0	0	0	0	0	0	0.0031	0.20344	0	0	0.003953	0	0
Santa Clara	2022	MDV	Aggregate	Electricity	Aggregate	623.6975	22215.8	0	22215.8	3205.616	8577.131	0	0	0	0	0	0	0.002	0.001523	0	0	0	0.008	0.004351	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2022	MDV	Aggregate	Plug-in Hyb	Aggregate	789.5612	33722.81	17285.18	16437.63	3264.836	4964.654	0.003363	0	0.11551	0.000723	0	0.002366	0.002	0.001369	0.000786	0	0.002574	0.008	0.003913	142.9094	0	99.86367	0.000458	0	0.042456	0.000605	0	0.020778	0.001454	0	0.173285	0.030414	0.029758	0.381921	0.002122	0	0.189725	0.030414	0.029758	0.381921	0.021528	0.220512	0	1.339893	0.001413	0	0.000987
Santa Clara	2022	MH	Aggregate	Aggregate	Gasoline	2642.084	23105.28	23105.28	0	264.3141	0	0.551445	0	0.40416	0.001917	0	0.000461	0.003	0.015756	0.002085	0	0.000502	0.012	0.045017	1949.266	0	32.13484	0.02167	0	0.038467	0.030967	0	0.041056	0.101032	0	0.168576	13.95792	0.32254	4.985527	0.147425	0	0.184569	13.95792	0.32254	4.985527	0.044583	2.705832	0	3.782453	0.01927	0	0.000318
Santa Clara	2022	MH	Aggregate	Aggregate	Diesel	940.8008	9155.21	9155.21	0	94.08008	0	4.438358	0	0	0.104654	0	0	0.004	0.015675	0.109386	0	0	0.016	0.044785	1080.89	0	0	0.005865	0	0	0.170295	0	0	0	0	0	0	0.126278	0	0	0	0.143759	0	0	0	0	0	0.143863	0.424501	0	0	0.010242	0	0
Santa Clara	2022	MHDT	Aggregate	Aggregate	Gasoline	1426.535	69284.18	69284.18	0	28542.11	0	0.686176	0.088062	0.462297	0.001432	0	0.000593	0.003	0.015756	0.001558	0	0.000645	0.012	0.045017	1819.358	542.4673	48.22005	0.022377	0.249961	0.051086	0.030967	0.006806	0.032093	0.113907	1.006391	0.293642	0.041091	0.336192	3.327263	0.166213	1.468523	0.321501	0.041091	0.336192	3.327263	0.044929	2.41434	15.04306	6.517433	0.017986	0.005363	0.000477
Santa Clara	2022	MHDT	Aggregate	Diesel	Aggregate	10189.55	428042.3	428042.3	0	121266.8	0	1.73167	15.28688	1.483339	0.020297	0.042841	0	0.003	0.015941	0.021215	0.044778	0	0.012	0.045546	1158.231	2324.123	0	0.002426	0.013407	0	0.18248	0.366167	0	0.052238	0.288656	0	0	0	0	0.05947	0.328613	0	0	0	0	0	0.196531	0.168917	7.277505	0	0.010968	0.022008	0
Santa Clara	2022	MHDT	Aggregate	Natural Ga	Aggregate	84.48052	3914.205	3914.205	0	796.8889	0	0.162027	6.474875	0	0.001029	0.016219	0	0.003	0.016011	0.001119	0.01764	0	0.012	0.045746	1002.329	5210.514	0	0.725882	17.91735	0	0.204331	1.062197	0	0.010371	0.256004	0	0	0	0	0.740815	18.28597	0	0	0	0	0	1.06	2.991509	30.51881	0	0	0	0
Santa Clara	2022	OBUS	Aggregate	Aggregate	Gasoline	470.9234	21653.3	21653.3	0	9422.235	0	0.596343	0.064966	0.407047	0.000863	0	0.000262	0.003	0.01568	0.000939	0	0.000285	0.012	0.044799	1804.41	384.2235	32.13915	0.017165	0.194553	0.036748	0.027969	0.005221	0.030733	0.084851	0.744858	0.194941	0.033671	0.142865	2.559429	0.123815	1.086895	0.213436	0.033671	0.142865	2.559429	0.044907	1.918016	5.766114	4.119591	0.017838	0.003798	0.000318
Santa Clara	2022	OBUS	Aggregate	Aggregate	Diesel	852.1679	61336.68	61336.68	0	8739.295	0	1.430263	8.186956	1.463102	0.021712	0.009363	0	0.003	0.01808	0.022694	0.009786	0	0.012	0.051656	1287.997	1601.524	0	0.002446	0.020931	0	0.202924	0.252321	0	0.052654	0.450629	0	0	0	0	0.059942	0.513007	0	0	0	0	0	0.209454	0.176751	7.212161	0	0.012197	0.015165	0
Santa Clara	2022	OBUS	Aggregate	Natural Ga	Aggregate	6.12419	392.3999	392.3599	0	54.50529	0	0.261572	1.567279	0	0.000722	0.003187	0	0.003	0.016148	0.000785	0.003466	0	0.012	0.046137	1035.05	1183.472	0	0.750937	4.605624	0	0.211002	0.241259	0	0.010729	0.065805	0	0	0	0	0.766387	4.700378	0	0	0	0	0	1.06	3.149633	5.746939	0	0	0	0
Santa Clara	2022	SBUS	Aggregate	Aggregate	Gasoline	160.4139	7959.43	7959.43	0	641.6556	0	0.527271	0.925562	0.689048	0.000853	0	0.000055	0.002	0.015721	0.000928	0	0.000599	0.008	0.044917	820.0467	2616.389	59.14656	0.01243	2.458676	0.074784	0.027982	0.086242	0.063619	0.060464	10.62737	0.42659	0.108472	0.246255	1.510943	0.088229	15.50744	0.467063	0.108472	0.246255	1.510943	0.045	1.548936	82.15497	10.71476	0.008107	0.025866	0.000585
Santa Clara	2022	SBUS	Aggregate	Diesel	Aggregate	662.5162	15413.71	15413.71	0	9593.235	0	4.235498	22.873	0.450634	0.022112	0.02288	0	0.003	0.015721	0.023112	0.023915	0	0.012	0.044917	1152.917	2246.353	0	0.002834	0.008182	0	0.181642	0.353914	0	0.061017	0.17615	0	0	0	0	0.069464	0.200533	0	0	0	0	0	0.140239	0.185604	4.488491	0	0.010917	0.021272	0
Santa Clara	2022	SBUS	Aggregate	Natural Ga	Aggregate	22.59677	578.3532	578.3532	0	327.2012	0	0.608852	5.295722	0	0.003378	0.010766	0	0.003	0.015721	0.003674	0.011708	0	0.012	0.044917	1281.922	4050.07	0	3.549889	15.56318	0	0.261328	0.825633	0	0.050721	0.222367	0	0	0	0	3.622922	15.88337	0	0	0	0	0	1.06	12.18179	19.41173	0	0	0	0
Santa Clara	2022	UBUS	Aggregate	Aggregate	Gasoline	45.81104	4784.037	4784.037	0	183.2442	0	0.03147	0	0.560776	0.000899	0	8.88E-05	0.002	0.03185	0.000978	0	9.66E-05	0.008	0.091	974.6428	0	38.21309	0.002303	0	0.053785	0.004696	0	0.082445	0.006534	0	0.197701	0.064874	0.125778	0.787098	0.009534	0	0.216458	0.064874	0.125778	0.787098	0.045	0.577943	0	5.5933	0.009635	0	0.000378
Santa Clara	2022	UBUS	Aggregate	Diesel	Aggregate	435.6475	48716.13	48716.13	0	1742.59	0	0.386257	0	0	0.007023	0	0	0.0083	0.0385	0.00734	0	0	0.0332	0.11	1100.743	0	0	0.003215	0	0	0.173422	0	0	0.069208	0	0	0	0	0	0.078788	0	0	0	0	0	0	0.187775	0.079368	0	0	0.01043	0	0
Santa Clara	2022	UBUS	Aggregate	Electricity	Aggregate	5.046757	199.0027	0	199.0027	20.18703	346.9103	0	0	0	0	0	0	0.009	0.01925	0	0	0	0.036	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2022	UBUS	Aggregate	Aggregate	Natural Ga	41.84875	4783.781	4783.781	0	167.395	0	0.058772	0	0	0.000282	0	0	0.008181	0.0385	0.000295	0	0	0.032723	0.11	1299.039	0	0	4.245393	0	0	0.264818	0	0	0.060658	0	0	0	0	0	4.332735	0	0	0	0	0	0	0.97	49.03622	0	0	0	0	0

Attachment 4: Project Construction and Operation Emissions and Health Risk Calculations

Construction Emissions and Health Risk Calculations

3300 El Camino Real, 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	0.0074	CON_DPM	14.9	0.00480	6.04E-04	12,175	4.96E-08
2022	Construction	0.0243	CON_DPM	48.5	0.01565	1.97E-03	12,175	1.62E-07
Total		***0.0317***		***63.4***	***0.0204***	***0.0026***		

Construction Hours

hr/day =	8.5	(8am - 4:30pm)
days/yr =	365	
hours/year =	3102.5	

3300 El Camino Real, 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	0.0020	4.0	0.00130	1.64E-04	12,175	1.35E-08
2022	Construction	CON_FUG	0.0004	0.8	0.00026	3.26E-05	12,175	2.68E-09
Total			***0.0024***	***4.9***	***0.0016***	***0.0002***		

Construction Hours

hr/day =	8.5	(8am - 4:30pm)
days/yr =	365	
hours/year =	3102.5	

3300 El Camino Real, 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	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021-2022	0.0468	0.0039	8.32	0.13	0.01	0.05
Total	-	-	**8.32**	**0.13**	-	-
Maximum	0.0468	0.0039	**-**	**-**	**0.01**	**0.05**

Maximum Impacts at Building Kidz of Palo Alto

Construction Year	Unmitigated Emissions: Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Unmitigated Emissions: Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021-2022	0.0010	0.0001	0.46	0.0002	0.001
Total	-	-	**0.46**	-	-
Maximum	0.0010	0.0001	**-**	**0.0002**	**0.001**

3300 El Camino Real, 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				Adult - Exposure Information					Maximum	
				DPM Conc (ug/m3)	Age	Infant/Child		Modeled DPM Conc (ug/m3)	Age	Adult			
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2021-2022	0.0468	10	0.64	2021-2022	0.0468	-	-			
1	1	0 - 1	2021-2022	0.0468	10	7.69	2021-2022	0.0468	1	0.13	0.01	0.004	0.05
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						**8.32**				**0.13**			

* Third trimester of pregnancy

3300 El Camino Real, Palo Alto, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult			
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2021-2022	0.0067	10	0.09	2021-2022	0.0067	-	-			
1	1	0 - 1	2021-2022	0.0067	10	1.10	2021-2022	0.0067	1	0.02	0.001	0.001	0.01
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**1.19**				**0.02**			

* Third trimester of pregnancy

3300 El Camino Real, Palo Alto, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Building Kidz of Palo Alto - 1 meter - Infant Exposure

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	0 - 1	2021-2022	0.0010	10	0.5
2	1			0.0000	10	0.0
3	1			0.0000	3	0.0
4	1			0.0000	3	0.0
5	1			0.0000	3	0.0
6	1			0.0000	3	0.0
7	1			0.0000	3	0.0
8	1			0.0000	3	0.0
9	1			0.0000	3	0.0
Total Increased Cancer Risk						**0.46**

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

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0002	0.0001	0.001

Project Generator Emissions and Health Risk Calculations

3300 El Camino Real, 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)
500-kW, 670-hp Generator	0.022	8.08
CalEEMod DPM Emissions	4.04E-03	tons/year

Modeling Information	
Model	AERMOD
Source	Diesel Generator Engine
Source Type	Point
Meteorological Data	2013-2017 Moffett Field Meterological Data
Point Source Stack Parameters	
Generator Engine Size (hp)	670
Stack Height (ft)	10.00
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)	0.000922

* AERMOD default

**BAAQMD default generator parameters

3300 El Camino Real, 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 (29-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	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2021-2022	0.0000	10	0.000				
1	1	0 - 1	2021-2022	0.0000	10	0.000				
2	1	1 - 2	2023	0.0017	10	0.279		0.0003	0.002	0.003
3	1	2 - 3	2024	0.0017	3	0.044		0.0003	0.002	0.003
4	1	3 - 4	2025	0.0017	3	0.044		0.0003	0.002	0.003
5	1	4 - 5	2026	0.0017	3	0.044		0.0003	0.002	0.003
6	1	5 - 6	2027	0.0017	3	0.044		0.0003	0.002	0.003
7	1	6 - 7	2028	0.0017	3	0.044		0.0003	0.002	0.003
8	1	7 - 8	2029	0.0017	3	0.044		0.0003	0.002	0.003
9	1	8 - 9	2030	0.0017	3	0.044		0.0003	0.002	0.003
10	1	9 - 10	2031	0.0017	3	0.044		0.0003	0.002	0.003
11	1	10 - 11	2032	0.0017	3	0.044		0.0003	0.002	0.003
12	1	11 - 12	2033	0.0017	3	0.044		0.0003	0.002	0.003
13	1	12 - 13	2034	0.0017	3	0.044		0.0003	0.002	0.003
14	1	13 - 14	2035	0.0017	3	0.044		0.0003	0.002	0.003
15	1	14 - 15	2036	0.0017	3	0.044		0.0003	0.002	0.003
16	1	15 - 16	2037	0.0017	3	0.044		0.0003	0.002	0.003
17	1	16-17	2038	0.0017	1	0.005		0.0003	0.002	0.003
18	1	17-18	2039	0.0017	1	0.005		0.0003	0.002	0.003
19	1	18-19	2040	0.0017	1	0.005		0.0003	0.002	0.003
20	1	19-20	2041	0.0017	1	0.005		0.0003	0.002	0.003
21	1	20-21	2042	0.0017	1	0.005		0.0003	0.002	0.003
22	1	21-22	2043	0.0017	1	0.005		0.0003	0.002	0.003
23	1	22-23	2044	0.0017	1	0.005		0.0003	0.002	0.003
24	1	23-24	2045	0.0017	1	0.005		0.0003	0.002	0.003
25	1	24-25	2046	0.0017	1	0.005		0.0003	0.002	0.003
26	1	25-26	2047	0.0017	1	0.005		0.0003	0.002	0.003
27	1	26-27	2048	0.0017	1	0.005		0.0003	0.002	0.003
28	1	27-28	2049	0.0017	1	0.005		0.0003	0.002	0.003
29	1	28-29	2050	0.0017	1	0.005		0.0003	0.002	0.003
30	1	29-30	2051	0.0017	1	0.005		0.0003	0.002	0.003
Total Increased Cancer Risk						**0.96**	**Max**	**0.0003**	**0.002**	**0.003**

* Third trimester of pregnancy

3300 El Camino Real, Palo Alto, CA - Cancer Risks from Project Operation
Project Emergency Generator
Impacts at Off-Site Building Kidz of Palo Alto Infant and Child Exposure- 1m MEI Receptor Heights
Impact at Project MEI (5-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	3.73	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
1	1	0 - 1	2023	0.0001	10	0.05		0.00002	0.0001	0.0002
2	1	1 - 2	2024	0.0001	10	0.05		0.00002	0.0001	0.0002
3	1	2 - 3	2025	0.0001	3	0.01		0.00002	0.0001	0.0002
4	1	3 - 4	2026	0.0001	3	0.01		0.00002	0.0001	0.0002
5	1	4 - 5	2027	0.0001	3	0.01		0.00002	0.0001	0.0002
6	1	5 - 6		0.0000	3	0.00				
7	1	6 - 7		0.0000	3	0.00				
8	1	7 - 8		0.0000	3	0.00				
9	1	8 - 9		0.0000	3	0.00				
Total Increased Cancer Risk						**0.13**	**Max**	**0.00002**	**0.0001**	**0.0002**

* Infants and children 0 - 5 years old

Attachment 5: Community Risk Modeling Information and Calculations

CT-EMFAC2017 Emissions Factors for El Camino Real

```
          File Name:   Santa Clara (SF) - 2021 - Annual.EF
CT-EMFAC2017 Version:   1.0.2.27401
            Run Date:   7/1/2021 12:27:30 PM
                Area:   Santa Clara (SF)
       Analysis Year:   2021
              Season:   Annual

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

Vehicle Category        VMT Fraction            Diesel VMT Fraction     Gas VMT Fraction
                        Across Category         Within Category         Within Category
         Truck 1             0.015                   0.468                   0.532
         Truck 2             0.020                   0.942                   0.045
       Non-Truck             0.965                   0.013                   0.964

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

              Road Type:       Major/Collector
     Silt Loading Factor:                CARB        0.032 g/m2
Precipitation Correction:                CARB        P = 64 days     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      0.012433        0.008522        0.005854        0.004194        0.003261        0.002703        0.002371
                  TOG      0.253005        0.167552        0.110890        0.077146        0.058280        0.046477        0.038833
            Diesel PM      0.003426        0.002860        0.002093        0.001560        0.001319        0.001194        0.001137

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

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

       Pollutant Name   Emission Factor
                  TOG          1.485763

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

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

       Pollutant Name   Emission Factor
                PM2.5          0.002107

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

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

       Pollutant Name   Emission Factor
                PM2.5          0.016814

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

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

       Pollutant Name   Emission Factor
                PM2.5          0.014890

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

El Camino Real Traffic Emissions and Health Risk Calculations

3300 El Camino Real, Palo Alto, CA - Off-Site Residential
Cumulative Operation - El Camino Real
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_CAM	El Camino Real Eastbound	EB	3	805.7	0.50	17.0	55.7	3.4	35	15,945
DPM_WB_CAM	El Camino Real Westbound	WB	3	801.7	0.50	17.0	55.7	3.4	35	15,945
				.					Total	31,890

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.00114			

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and DPM Emissions - DPM_EB_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.82%	608	9.62E-05	9	6.42%	1023	1.62E-04	17	5.55%	885	1.40E-04
2	2.60%	415	6.56E-05	10	7.23%	1152	1.82E-04	18	3.24%	516	8.16E-05
3	2.83%	452	7.14E-05	11	6.30%	1005	1.59E-04	19	2.43%	387	6.12E-05
4	3.41%	544	8.60E-05	12	6.99%	1115	1.76E-04	20	0.92%	147	2.33E-05
5	2.20%	350	5.54E-05	13	6.18%	986	1.56E-04	21	3.06%	488	7.72E-05
6	3.35%	535	8.45E-05	14	6.13%	977	1.54E-04	22	4.16%	664	1.05E-04
7	6.13%	977	1.54E-04	15	5.14%	820	1.30E-04	23	2.43%	387	6.12E-05
8	4.74%	756	1.20E-04	16	3.87%	618	9.76E-05	24	0.87%	138	2.19E-05
								Total		15,945	

2021 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_WB_CAM

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.82%	608	9.57E-05	9	6.42%	1023	1.61E-04	17	5.55%	885	1.39E-04
2	2.60%	415	6.53E-05	10	7.23%	1152	1.81E-04	18	3.24%	516	8.12E-05
3	2.83%	452	7.11E-05	11	6.30%	1005	1.58E-04	19	2.43%	387	6.09E-05
4	3.41%	544	8.56E-05	12	6.99%	1115	1.75E-04	20	0.92%	147	2.32E-05
5	2.20%	350	5.51E-05	13	6.18%	986	1.55E-04	21	3.06%	488	7.69E-05
6	3.35%	535	8.41E-05	14	6.13%	977	1.54E-04	22	4.16%	664	1.04E-04
7	6.13%	977	1.54E-04	15	5.14%	820	1.29E-04	23	2.43%	387	6.09E-05
8	4.74%	756	1.19E-04	16	3.87%	618	9.72E-05	24	0.87%	138	2.18E-05
								Total		15,945	

3300 El Camino Real, Palo Alto, CA - Off-Site Residential
Cumulative Operation - El Camino Real
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_CAM	El Camino Real Eastbound	EB	3	805.7	0.50	17.0	56	1.3	35	15,945
PM2.5_WB_CAM	El Camino Real Westbound	WB	3	801.7	0.50	17.0	56	1.3	35	15,945
									Total	31,890

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.002371			

Emisson Factors from CT-EMFAC2017

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

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.16%	184	6.08E-05	9	7.11%	1133	3.74E-04	17	7.38%	1177	3.88E-04
2	0.42%	67	2.21E-05	10	4.39%	700	2.31E-04	18	8.17%	1302	4.29E-04
3	0.41%	65	2.15E-05	11	4.67%	744	2.45E-04	19	5.70%	909	3.00E-04
4	0.27%	43	1.41E-05	12	5.89%	939	3.10E-04	20	4.27%	681	2.25E-04
5	0.50%	80	2.65E-05	13	6.15%	981	3.23E-04	21	3.25%	519	1.71E-04
6	0.91%	145	4.78E-05	14	6.03%	962	3.17E-04	22	3.30%	526	1.73E-04
7	3.79%	605	1.99E-04	15	7.01%	1117	3.68E-04	23	2.46%	392	1.29E-04
8	7.76%	1238	4.08E-04	16	7.14%	1138	3.75E-04	24	1.87%	297	9.81E-05
								Total		15,945	

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

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.16%	184	6.05E-05	9	7.11%	1133	3.72E-04	17	7.38%	1177	3.86E-04
2	0.42%	67	2.20E-05	10	4.39%	700	2.30E-04	18	8.17%	1302	4.27E-04
3	0.41%	65	2.14E-05	11	4.67%	744	2.44E-04	19	5.70%	909	2.98E-04
4	0.27%	43	1.40E-05	12	5.89%	939	3.08E-04	20	4.27%	681	2.23E-04
5	0.50%	80	2.64E-05	13	6.15%	981	3.22E-04	21	3.25%	519	1.70E-04
6	0.91%	145	4.75E-05	14	6.03%	962	3.16E-04	22	3.30%	526	1.73E-04
7	3.79%	605	1.98E-04	15	7.01%	1117	3.67E-04	23	2.46%	392	1.29E-04
8	7.76%	1238	4.06E-04	16	7.14%	1138	3.73E-04	24	1.87%	297	9.76E-05
								Total		15,945	

3300 El Camino Real, Palo Alto, CA - Off-Site Residential
Cumulative Operation - El Camino Real
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_CAM	El Camino Real Eastbound	EB	3	805.7	0.50	17.0	56	1.3	35	15,945
TEXH_WB_CAM	El Camino Real Westbound	WB	3	801.7	0.50	17.0	56	1.3	35	15,945
									Total	31,890

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.03883			

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_EB_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.16%	184	9.96E-04	9	7.11%	1133	6.12E-03	17	7.38%	1177	6.36E-03
2	0.42%	67	3.62E-04	10	4.39%	700	3.78E-03	18	8.17%	1302	7.03E-03
3	0.41%	65	3.52E-04	11	4.67%	744	4.02E-03	19	5.70%	909	4.91E-03
4	0.27%	43	2.31E-04	12	5.89%	939	5.07E-03	20	4.27%	681	3.68E-03
5	0.50%	80	4.34E-04	13	6.15%	981	5.30E-03	21	3.25%	519	2.80E-03
6	0.91%	145	7.82E-04	14	6.03%	962	5.20E-03	22	3.30%	526	2.84E-03
7	3.79%	605	3.27E-03	15	7.01%	1117	6.03E-03	23	2.46%	392	2.12E-03
8	7.76%	1238	6.68E-03	16	7.14%	1138	6.14E-03	24	1.87%	297	1.61E-03
								Total		15,945	

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

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.16%	184	9.91E-04	9	7.11%	1133	6.09E-03	17	7.38%	1177	6.33E-03
2	0.42%	67	3.60E-04	10	4.39%	700	3.76E-03	18	8.17%	1302	7.00E-03
3	0.41%	65	3.50E-04	11	4.67%	744	4.00E-03	19	5.70%	909	4.88E-03
4	0.27%	43	2.30E-04	12	5.89%	939	5.05E-03	20	4.27%	681	3.66E-03
5	0.50%	80	4.32E-04	13	6.15%	981	5.27E-03	21	3.25%	519	2.79E-03
6	0.91%	145	7.78E-04	14	6.03%	962	5.17E-03	22	3.30%	526	2.83E-03
7	3.79%	605	3.25E-03	15	7.01%	1117	6.00E-03	23	2.46%	392	2.11E-03
8	7.76%	1238	6.65E-03	16	7.14%	1138	6.11E-03	24	1.87%	297	1.60E-03
								Total		15,945	

3300 El Camino Real, Palo Alto, CA - Off-Site Residential
Cumulative Operation - El Camino Real
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_CAM	El Camino Real Eastbound	EB	3	805.7	0.50	17.0	56	1.3	35	15,945
TEVAP_WB_CAM	El Camino Real Westbound	WB	3	801.7	0.50	17.0	56	1.3	35	15,945
									Total	31,890

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle per Hour (g/hour)	1.48576			
Emissions per Vehicle per Mile (g/VMT)	0.04245			

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_EB_CAM

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.16%	184	1.09E-03	9	7.11%	1133	6.69E-03	17	7.38%	1177	6.95E-03
2	0.42%	67	3.96E-04	10	4.39%	700	4.13E-03	18	8.17%	1302	7.69E-03
3	0.41%	65	3.85E-04	11	4.67%	744	4.39E-03	19	5.70%	909	5.36E-03
4	0.27%	43	2.53E-04	12	5.89%	939	5.54E-03	20	4.27%	681	4.02E-03
5	0.50%	80	4.74E-04	13	6.15%	981	5.79E-03	21	3.25%	519	3.06E-03
6	0.91%	145	8.55E-04	14	6.03%	962	5.68E-03	22	3.30%	526	3.10E-03
7	3.79%	605	3.57E-03	15	7.01%	1117	6.60E-03	23	2.46%	392	2.31E-03
8	7.76%	1238	7.31E-03	16	7.14%	1138	6.72E-03	24	1.87%	297	1.76E-03
								Total		15,945	

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

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.16%	184	1.08E-03	9	7.11%	1133	6.66E-03	17	7.38%	1177	6.92E-03
2	0.42%	67	3.94E-04	10	4.39%	700	4.11E-03	18	8.17%	1302	7.65E-03
3	0.41%	65	3.83E-04	11	4.67%	744	4.37E-03	19	5.70%	909	5.34E-03
4	0.27%	43	2.51E-04	12	5.89%	939	5.52E-03	20	4.27%	681	4.00E-03
5	0.50%	80	4.72E-04	13	6.15%	981	5.76E-03	21	3.25%	519	3.05E-03
6	0.91%	145	8.51E-04	14	6.03%	962	5.65E-03	22	3.30%	526	3.09E-03
7	3.79%	605	3.55E-03	15	7.01%	1117	6.56E-03	23	2.46%	392	2.30E-03
8	7.76%	1238	7.27E-03	16	7.14%	1138	6.68E-03	24	1.87%	297	1.75E-03
								Total		15,945	

3300 El Camino Real, Palo Alto, CA - Off-Site Residential
Cumulative Operation - El Camino Real
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_CAM	El Camino Real Eastbound	EB	3	805.7	0.50	17.0	56	1.3	35	15,945
FUG_WB_CAM	El Camino Real Westbound	WB	3	801.7	0.50	17.0	56	1.3	35	15,945
									Total	31,890

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00211			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01681			
Road Dust - Emissions per Vehicle (g/VMT)	0.01489			
otal Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.03381			

Emisson Factors from CT-EMFAC2017

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

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.16%	184	8.67E-04	9	7.11%	1133	5.33E-03	17	7.38%	1177	5.54E-03
2	0.42%	67	3.15E-04	10	4.39%	700	3.29E-03	18	8.17%	1302	6.12E-03
3	0.41%	65	3.06E-04	11	4.67%	744	3.50E-03	19	5.70%	909	4.27E-03
4	0.27%	43	2.01E-04	12	5.89%	939	4.42E-03	20	4.27%	681	3.20E-03
5	0.50%	80	3.78E-04	13	6.15%	981	4.61E-03	21	3.25%	519	2.44E-03
6	0.91%	145	6.81E-04	14	6.03%	962	4.52E-03	22	3.30%	526	2.47E-03
7	3.79%	605	2.84E-03	15	7.01%	1117	5.25E-03	23	2.46%	392	1.84E-03
8	7.76%	1238	5.82E-03	16	7.14%	1138	5.35E-03	24	1.87%	297	1.40E-03
								Total		15,945	

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

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.16%	184	8.63E-04	9	7.11%	1133	5.30E-03	17	7.38%	1177	5.51E-03
2	0.42%	67	3.14E-04	10	4.39%	700	3.27E-03	18	8.17%	1302	6.09E-03
3	0.41%	65	3.05E-04	11	4.67%	744	3.48E-03	19	5.70%	909	4.25E-03
4	0.27%	43	2.00E-04	12	5.89%	939	4.39E-03	20	4.27%	681	3.19E-03
5	0.50%	80	3.76E-04	13	6.15%	981	4.59E-03	21	3.25%	519	2.43E-03
6	0.91%	145	6.78E-04	14	6.03%	962	4.50E-03	22	3.30%	526	2.46E-03
7	3.79%	605	2.83E-03	15	7.01%	1117	5.23E-03	23	2.46%	392	1.83E-03
8	7.76%	1238	5.79E-03	16	7.14%	1138	5.32E-03	24	1.87%	297	1.39E-03
								Total		15,945	

3300 El Camino Real, Palo Alto, CA - El Camino Real Traffic - TACs & PM2.
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	
BAAQMD Moffett Field Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Construction Residential MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.0041	0.1531	0.1672

Construction Residential MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.1425	0.1332	0.0094

3300 El Camino Real, Palo Alto, CA - El Camino Real 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)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0041	0.1531	0.1672	0.055	0.012	0.0008	0.07
1	1	0 - 1	2021	10	0.0041	0.1531	0.1672	0.668	0.144	0.0092	0.82
2	1	1 - 2	2022	10	0.0041	0.1531	0.1672	0.668	0.144	0.0092	0.82
3	1	2 - 3	2023	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
4	1	3 - 4	2024	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
5	1	4 - 5	2025	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
6	1	5 - 6	2026	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
7	1	6 - 7	2027	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
8	1	7 - 8	2028	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
9	1	8 - 9	2029	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
10	1	9 - 10	2030	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
11	1	10 - 11	2031	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
12	1	11 - 12	2032	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
13	1	12 - 13	2033	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
14	1	13 - 14	2034	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
15	1	14 - 15	2035	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
16	1	15 - 16	2036	3	0.0041	0.1531	0.1672	0.105	0.023	0.0015	0.13
17	1	16 - 17	2037	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
18	1	17 - 18	2038	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
19	1	18 - 19	2039	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
20	1	19 - 20	2040	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
21	1	20 - 21	2041	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
22	1	21 - 22	2042	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
23	1	22 - 23	2043	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
24	1	23 - 24	2044	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
25	1	24 - 25	2045	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
26	1	25 - 26	2046	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
27	1	26 - 27	2047	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
28	1	27 - 28	2048	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
29	1	28 - 29	2049	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
30	1	29 - 30	2050	1	0.0041	0.1531	0.1672	0.012	0.003	0.0002	0.01
Total Increased Cancer Risk								3.03	0.650	0.042	**3.72**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.001	0.13	0.14

* Third trimester of pregnancy

Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

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

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

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

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

Table A: Requester Contact Information

Date of Request	**4/23/2021**
Contact Name	Casey Divine
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x103
Email	cdivine@illingworthrodkin.com
Project Name	3300 ECR
Address	3300 El Camino Real
City	Palo Alto
County	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.)	Office
Project Size (# of units or building square feet)	52,872 sqft

Comments:

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

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

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

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

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

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

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

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

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

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

Table B: Google Earth data

Construction MEI

Distance from Receptor (feet) or MEI[1]	Plant No.	Facility Name	Address	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
1000+	5542	Arts Bodycraft Inc	280 Lambert Avenue	--	0.01	--		AutoBody Coating Operations		2018 Dataset	0.13	#VALUE!	0.001	#VALUE!
1000+	13501	Pacific Bell	3350 Birch Street	0.56	0.03	0.02		Emergency Diesel Turbine		2018 Dataset	0.13	0.07	0.004	0.003
1000+	15249	Akins Body Shop Inc	2905 El Camino Real	--	--	--		AutoBody Coating Operations		2018 Dataset	0.13	#VALUE!	#VALUE!	#VALUE!
1000+	16649	Hudson Pacific Properties Inc	3000 El Camino Real Bldg	--	--	--		Generators		2018 Dataset	0.04	#VALUE!	#VALUE!	#VALUE!
900	112610	Barron Park Shell	3601 El Camino Real	7.56	0.03	--		Gas Dispensing Facility		2018 Dataset	0.02	0.14	0.001	#VALUE!

Footnotes:

1. Maximally exposed individual

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

7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003 or less. To be
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010.
    Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead should reflect the number
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

Date last updated:
03/13/2018

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 5,448,559.55 ft²

Apr 23 2021 15:33:39 Pacific Daylight Time

Summary

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

Permitted Facilities 2018

#	FACID	Name	Address	City	St
1	5542	Arts Bodycraft Inc	280 Lambert Avenue	Palo Alto	CA
2	13501	Pacific Bell	3350 Birch Street	Palo Alto	CA
3	15249	Akins Body Shop Inc	2905 El Camino Real	Palo Alto	CA
4	16649	Hudson Pacific Properties Inc	3000 El Camino Real Bldg 2 & 5	Palo Alto	CA
5	112610	Barron Park Shell	3601 El Camino Real	Palo Alto	CA

#	Zip	County	Cancer	Hazard	PM_25	Type	Count
1	94306	Santa Clara	0.000	0.010	0.000	Contact BAAQMD	1
2	94306	Santa Clara	0.560	0.030	0.020	Contact BAAQMD	1
3	94306	Santa Clara	0.000	0.000	0.000	Contact BAAQMD	1
4	94306	Santa Clara	0.000	0.000	0.000	Generators	1
5	94306	Santa Clara	7.560	0.030	0.000	Gas Dispensing Facility	1

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

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