Appendix A

Air Quality Assessment

125 KIRK AVENUE SUBDIVISION CONSTRUCTION HEALTH RISK ASSESSMENT

San José, California

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Introduction

The purpose of this report is to address the potential health risk impacts associated with the construction of a proposed residential development located at 125 Kirk Avenue in San José, California. The air quality impacts from this project would be associated with demolition of the existing land use and construction of the residential buildings. Air pollutant emissions associated with construction of the project were predicted using appropriate computer models. In addition, the potential health risk impacts from existing toxic air contaminant (TAC) sources affecting the nearby and proposed sensitive receptors were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The Project proposes to demolish the existing single-family residence and structures located on the approximately 1.49-acre project site and construct 18 residential units. There would be a total of 18 homes, made up of 16 duplex homes and 2 single family dwellings. Each unit would have its own attached two-car garage for a total of 36 parking spaces, and there would be 9 additional uncovered parking spaces. Access to the proposed development would be provided via a driveway located on Kirk Avenue.

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 with the exception of ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

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

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

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

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality, often because they cause 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 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. Health risks from TACs are estimated using the Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines, which were published in February of 2015.[2] See *Attachment 1* for a detailed description of the health risk modeling methodology used in this assessment.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are the residents in the single-family housing surrounding the site, as well as multi-family housing to the north and west of the project site. Additional sensitive receptors are located at further distances from the site.

There are several schools and daycare facilities near the project site. These include the Mandala Children's House Montessori Preschool located 225 feet to the east of the site, the Linda Vista Elementary School located 170 feet north of the site, the Bright Little Minds preschool and daycare located 630 feet to the east, the Kidango preschool at Linda Vista Center located 590 feet northeast of the site, and the Home Away From Home Childcare facility located 690 feet to the southeast.

[2] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

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.[3] 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.

Additionally, overburdened communities are areas located (i) within a census tract identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0 implemented by OEHHA, as having an overall score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract.[4] The project site is not located in the San José CARE area or within an overburdened area as identified by CalEnviroScreen as the Project site is scored at the 40th percentile.[5]

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[6] 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

[3] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.
[4] See BAAQMD: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20210722_01_appendixd_mapsofoverburdenedcommunities-pdf.pdf?la=en , accessed 10/1/2021.
[5] OEHAA, CalEnviroScreen 4.0 Indicator Maps https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40
[6] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

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

San José Envision 2040 General Plan

The San José Envision 2040 General Plan includes goals, policies, and actions to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants or TACs. The following goals, policies, and actions are applicable to the proposed project and this assessment:

Applicable Goals – Air Pollutant Emission Reduction

Goal MS-10 Minimize emissions from new development.

Applicable Policies – Air Pollutant Emission Reduction

MS-10.1 Assess projected air emissions from new development in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and relative to state and federal standards. Identify and implement feasible air emission reduction measures.

MS-10.2 Consider the cumulative air quality impacts from proposed developments for proposed land use designation changes and new development, consistent with the region's Clean Air Plan and State law.

MS-10.3 Promote the expansion and improvement of public transportation services and facilities, where appropriate, to both encourage energy conservation and reduce air pollution.

Applicable Goals – Toxic Air Contaminants

Goal MS-11 Minimize exposure of people to air pollution and toxic air contaminants such as ozone, carbon monoxide, lead, and particulate matter.

Applicable Policies – Toxic Air Contaminants

MS-11.2 For projects that emit toxic air contaminants, require project proponents to prepare health risk assessments in accordance with BAAQMD-recommended procedures as part of environmental review and employ effective mitigation to reduce possible health risks to a less than significant level. Alternatively, require new projects (such as, but not limited to, industrial, manufacturing, and processing facilities) that are sources of TACs to be located an adequate distance from residential areas and other sensitive receptors.

MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources.

MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses.

Actions – Toxic Air Contaminants

MS-11.7 Consult with BAAQMD to identify stationary and mobile TAC sources and determine the need for and requirements of a health risk assessment for proposed developments.

MS-11.8 For new projects that generate truck traffic, require signage which reminds drivers that the State truck idling law limits truck idling to five minutes.

Applicable Goals – Construction Air Emissions

Goal MS-13 Minimize air pollutant emissions during demolition and construction activities

Applicable Policies – Construction Air Emissions

MS-13.1 Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type.

Applicable Actions – Construction Air Emissions

MS-13.4 Adopt and periodically update dust, particulate, and exhaust control standard measures for demolition and grading activities to include on project plans as conditions of approval based upon construction mitigation measures in the BAAQMD CEQA Guidelines.

Significance Thresholds

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

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	
	Average Daily Emissions (lbs./day)	
ROG	54	
NO_x	54	
PM_{10}	82 (Exhaust)	
$PM_{2.5}$	54 (Exhaust)	
CO	Not Applicable	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1000-foot zone of influence)**
Excess Cancer Risk	10 per one million	100 per one million
Hazard Index	1.0	10.0
Incremental annual $PM_{2.5}$	0.3 µg/m^3	0.8 µg/m^3

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.

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

Construction Health Risk Impacts and Mitigation Measures

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

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

Health risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust emissions pose health risks for sensitive receptors such as surrounding residents. The primary health 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 health 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
Condo/Townhouse	18	Dwelling Unit	18,000*	1.49
Enclosed Parking Structure[9]	36	Parking Space	14,400*	
Parking Lot	9	Parking Space	3,600*	
Other Asphalt Surfaces	12.75	1,000-sf	12,750	
*Default CalEEMod square footages used.				

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 generated using CalEEMod defaults for a project of this type and size.

Within each of the CalEEMod construct phases, the quantity of equipment to be used along with the average hours per day and total number of workdays were based on CalEEMod defaults. The construction schedule assumed that the earliest possible start date would be January 2023 and would be completed over a period of approximately 11 months, or 250 construction workdays.

[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.
[9] Represents two-car garages attached to each dwelling unit.

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 demolition material to be exported, estimate of soil material imported and/or exported to the site, and the estimate of concrete and asphalt truck trips. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. The total trips for worker and vendor trips were computed by multiplying the daily trip rate by the number of days in that phase. Haul trips for demolition and soil import/export were estimated by CalEEMod using the estimated demolition and grading volumes provided.[10] The number of concrete and asphalt deliveries were estimated for the project by the client 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 concrete trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (demolition and soil import/export). Since CalEEMod does not specifically address concrete/asphalt deliveries to the site, they were assumed to travel the same distance as vendors (7.3 miles). 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 year 2023 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2021 emission database to compute vehicle emissions.

[10] CalEEMod assumes each truck can carry 10 tons per load or 10 cubic yards of material.

Table 3. Construction Traffic Data Used for EMFAC2021 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	50% LDA 25% LDT1 25% LDT2	50% MHDT 50% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Concrete/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Demolition	260	-	260	Est. 5,250-sf of existing building demolition and est. 26,600-sf of pavement demolition. CalEEMod default worker trips
Site Preparation	20	-	-	CalEEMod default worker trips.
Grading	40	-	250	1,000-cy soil export and 1,000-cy soil import. CalEEMod default worker trips.
Trenching	20	-	-	CalEEMod default worker trips.
Building Construction	5,200	1,400	480	Est 240 concrete-truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	50	-	-	CalEEMod default worker trips.
Paving	130	-	34	Est 17 asphalt truck round trips. CalEEMod default worker trips.

Notes: [1] Based on 2023 EMFAC2021 light-duty vehicle fleet mix for Santa Clara County.
[2] Includes demolition and soil import/export trips estimated by CalEEMod based on amount of material to be removed. Concrete and asphalt trips estimated based on data provided by the applicant.

Summary of Computed Construction Period Emissions

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions by the number of active construction workdays that year. Additionally, average daily construction emissions were estimated for the total duration of the project (478 days). Table 4 shows the annualized average daily construction emissions and average daily project emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction. As indicated in Table 4, predicted daily project construction emissions would not exceed the BAAQMD significance thresholds during any year of construction.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions (Tons)				
2023	0.32	1.47	0.07	0.06
Average Daily Construction Emissions (pounds/day)				
2023 (250 construction workdays)	2.55	11.77	0.53	0.49
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. San Jose General Policy MS-10.1 specifies that projects should assess projected air emissions from new development in conformance with the BAAQMD CEQA Guidelines, relative to state and federal standards and identify and implement feasible air emission reduction measures. Thus, San Jose General Policy MS-10.1 requires construction projects implement BAAQMD-Recommended Standard Measures to control PM_{10} and $PM_{2.5}$ emissions. *Mitigation Measure AQ-1 would implement BAAQMD's standard measures*.

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

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

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

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

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

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

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

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

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

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

Effectiveness of Mitigation Measure AQ-1

Mitigation Measure AQ-1 represents standard mitigation measures that would achieve greater than a 50 percent reduction in on-site fugitive $PM_{2.5}$ emissions. 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.

Health Risk from Project Construction

Construction Emissions

The CalEEMod model was used to estimate emissions from on-site construction activity and construction vehicle trips. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMFAC2021 model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[11] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

The CalEEMod model emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and EMFAC2021 provided exhaust emission rates from on-road vehicles. 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. Total uncontrolled DPM emissions from onsite construction activities was estimated to be 0.06 tons (124.9 pounds). Uncontrolled fugitive dust ($PM_{2.5}$) emissions were calculated by CalEEMod as less than 0.01 tons (21.8 pounds) for the project.

Dispersion Modeling

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

[11] See CARB's EMFAC2021 Emissions Inventory at https://arb.ca.gov/emfac/emissions-inventory.

of these types of emission activities for CEQA projects.[12,13] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at sensitive receptors near 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.[14] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

Combustion equipment DPM exhaust emissions were modeled using a as a series of point sources with nine-foot release heights (construction equipment exhaust stack height) placed at 23 feet (7 meter) intervals throughout the construction site. This resulted in 116 individual point sources being used to represent mobile equipment DPM exhaust emissions in the construction area, with DPM emissions occurring throughout the project construction site. In addition, the following stack parameters were used for each point source: stack diameter of 2.5 inches, an exhaust temperature of 918˚F, and an exit velocity of 309 feet per second. Since these are point sources, plume rise is calculated by the AERMOD dispersion model. Emissions from vehicle travel on- and off-site were also distributed among the point sources throughout the site. The locations of the point sources used for the modeling are identified in Figure 1.

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

AERMOD Inputs and Meteorological Data

The modeling used a five-year data set (2013 - 2017) of hourly meteorological data from the San Jose Airport prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring Monday through Friday between 8:00 a.m. to 5:00 p.m. when the

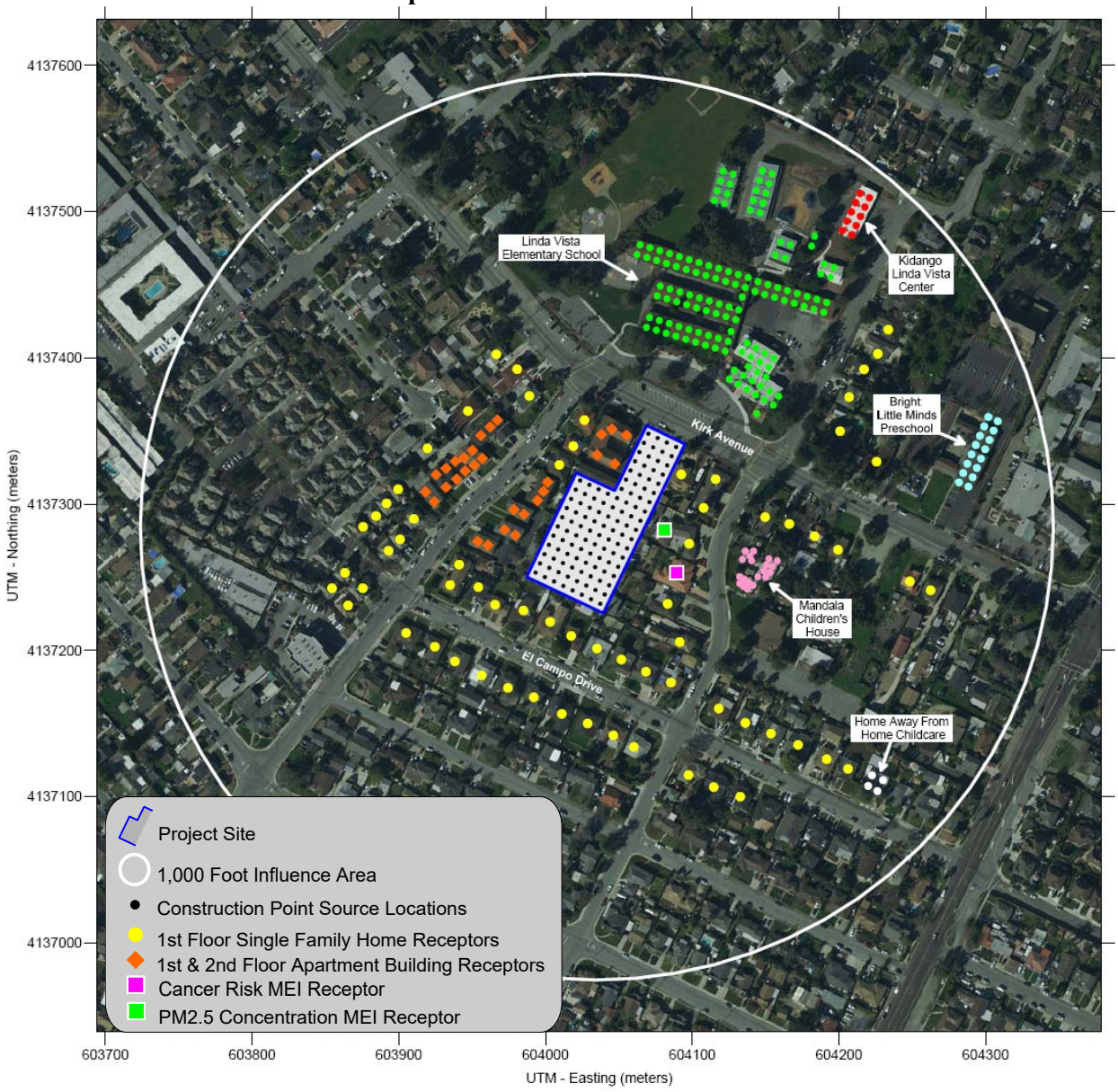
[12] BAAQMD, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

[13] BAAQMD, 2020, *BAAQMD Health Risk Assessment Modeling Protocol.* December. Web: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en

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

majority of construction activity is expected to occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2023 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing height of residences on the first and second floors, respectively, of nearby single-family residences and apartments.[15] A receptor height of 3 feet (1 meter) was used to represent the breathing height of children at the nearby schools and daycare facilities.

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



[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

Summary of Construction Health Risk Impacts

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

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

The maximum-modeled annual DPM and $PM_{2.5}$ concentrations were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individual (MEI) for cancer risk and $PM_{2.5}$ concentration. Results of this assessment indicated that the construction MEIs for cancer risk and $PM_{2.5}$ concentration occurred at different locations, both at the first-floor receptor level (1.5 meters) of two single family homes east of the project site. Table 5 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEIs. *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 schools and daycare facilities. These include the Mandala Children's House Montessori preschool, the Linda Vista Elementary School, the Bright Little Minds preschool, the Kidango preschool at Linda Vista Center, and the Home Away From Home Childcare facility.

The maximum school uncontrolled cancer risk and $PM_{2.5}$ concentration occurred at different locations. The maximum $PM_{2.5}$ concentration occurred at the Mandala Children's House Montessori preschool while the maximum increased cancer risk occurred at the Home Away From Home Childcare facility. The maximum $PM_{2.5}$ concentrations and HIs at all nearby schools and daycare facilities would not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 5. Details of the health risk impact calculations for the schools and daycares are included in *Attachment 4*.

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

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	**20.8 (infant)**	0.20	.002
	Mitigated*	5.7 (infant)	0.07	>0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*
Mandala Children' House Preschool				
Project Construction	Unmitigated	*5.0 (child)*	*0.12*	*>0.01*
	Mitigated*	*1.4 (child)*	*0.04*	*>0.01*
Home Away From Home Childcare Facility				
Project Construction	Unmitigated	***14.9 (infant)***	*0.03*	*>0.01*
	Mitigated*	*4.1 (infant)*	*0,01*	*>0.01*
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*

* Construction equipment with Tier 4 interim engines and BMPs as Mitigation Measures.

In order to meet the BAAQMD single-source health risk thresholds for cancer risk at the residential and school MEIs, the project would require mitigating DPM emissions from construction. Therefore, *Mitigation Measure AQ-2* would be required.

Mitigation Measure AQ-2: **Use construction equipment that has low diesel particulate matter exhaust to minimize emissions and limit use of diesel-powered stationary equipment**

Implement a feasible plan to reduce DPM emissions by 60 percent such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below TAC significance levels as follows:

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

    a. If use of Tier 4 equipment is not available, alternatively use equipment that meets U.S. EPA emission standards for Tier 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve an 60 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

2. Alternatively, the applicant may develop another construction operations plan demonstrating that the construction equipment used on-site would achieve a reduction in construction diesel particulate matter emissions by 60 percent or greater. Elements of the plan could include a combination of some of the following measures:
    - Implementation of No. 1 above to use Tier 4 engines or alternatively fueled equipment,

- Installation of electric power lines during early construction phases to avoid use of diesel generators and compressors,
- Use of electrically-powered equipment,
- Forklifts and aerial lifts used for exterior and interior building construction shall be electric or propane/natural gas powered,
- Change in construction build-out plans to lengthen phases, and
- Implementation of different building techniques that result in less diesel equipment usage.

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

Effectiveness of Mitigation Measure AQ-1 and AQ-2

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 Interim engine standards and BAAQMD best management practices for construction were included. With these measures implemented, the project's construction cancer risk impact, assuming infant exposure, would be reduced by 73 percent to 5.7 per million at the residential MEI and to 4.1 per million at the school MEI. A plan that reduces DPM emissions by 60 percent would reduce cancer risk to below the single-source threshold. As a result, the project's construction cancer risk would be reduced below the BAAQMD single-source threshold.

Cumulative Health Risks of all TAC Sources at the Off-Site Project MEI

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

A review of the project area using traffic data collected by the County of Santa Clara indicated that no roadways within the influence area would have traffic exceeding 10,000 vehicles per day.[16] A review of BAAQMD's *Permitted Stationary Sources 2020* geographic information systems (GIS) map tool[17] identified no stationary sources with the potential to affect the project site and MEI. This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. Figure 2 shows the project area included within the influence area. Details of the modeling and health risk calculations are included in *Attachment 4.*

[16] City of San Jose. *Traffic Volume*. Web: https://csj.maps.arcgis.com/apps/webappviewer/index.html?id=067fbd3db8dd44f8a60f48148331b3d7

[17] BAAQMD, *Stationary Source Screening Map*, 2022. Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3

Figure 2. Project Site and 1,000-foot Influence Area

Supporting Documentation

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

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

Attachment 3 includes the EMFAC2021 emissions modeling.

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 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.[18] 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.[19] 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.[20] 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

[18] 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.
[19] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[20] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

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

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: Kirk Avenue Defaults

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size
18 Dwelling Units
1.49 total project acres disturbed
_____ s.f. residential
_____ s.f. retail
_____ s.f. office/commercial
12,750 s.f. other, specify: Private street
_____ s.f. parking garage 36 spaces
_____ s.f. parking lot 9 spaces

Construction Hours am to pm

Pile Driving? Y/N?

Project include OPERATIONAL GENERATOR OR FIRE PUMP on-site? Y/N? ____
IF YES (if BOTH separate values) -->
Kilowatts/Horsepower: _____
Fuel Type: _____
Location in project (Plans Desired if Available):

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

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	HP Annual Hours	Comments
	Demolition	**Start Date:**	**1/2/2023**	**Total phase:**	**20**			**Overall Import/Export Volumes**
		End Date:	**1/27/2023**					
1	Concrete/Industrial Saws	81	0.73	8	20	8	9461	**Demolition Volume**
	Excavators	158	0.38			0	0	Square footage of buildings to be demolished
1	Rubber-Tired Dozers	247	0.4	8	20	8	15808	(*or* total tons to be hauled)
3	Tractors/Loaders/Backhoes	97	0.37	8	20	8	17227	**_5250_** square feet *or*
	Other Equipment?							**_?_** Hauling volume (tons)
								Any pavement demolished and hauled? **_26600 sf**
	Site Preparation	**Start Date:**	**1/28/2023**	**Total phase:**	**2**			
		End Date:	**1/31/2023**					
1	Graders	187	0.41	8	2	8	1227	
1	Rubber Tired Dozers	247	0.4	7	2	7	1383	
1	Tractors/Loaders/Backhoes	97	0.37	8	2	8	574	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**2/1/2023**	**Total phase:**	**4**			
		End Date:	**2/6/2023**					**Soil Hauling Volume**
	Excavators	158	0.38			0	0	Export volume = **_1000** cubic yards?
1	Graders	187	0.41	8	4	8	2453	Import volume = **1000** cubic yards?
1	Rubber Tired Dozers	247	0.4	8	4	8	3162	
	Concrete/Industrial Saws	81	0.73			0	0	
2	Tractors/Loaders/Backhoes	97	0.37	7	4	7	2010	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**2/7/2023**	**Total phase:**	**4**			
		End Date:	**2/10/2023**					
1	Tractor/Loader/Backhoe	97	0.37	8	4	8	1148	
1	Excavators	158	0.38	8	4	8	1921	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**2/11/2023**	**Total phase:**	**200**			**Cement Trucks? _240_ Total Round-Trips**
		End Date:	**11/17/2023**					
1	Cranes	231	0.29	6	200	6	80388	Electric? (Y/N) Otherwise assumed diesel
1	Forklifts	89	0.2	6	200	6	21360	Liquid Propane (LPG)? (Y/N) Otherwise Assumed diesel
1	Generator Sets	84	0.74	8	200	8	99456	Or temporary line power? (Y/N)
1	Tractors/Loaders/Backhoes	97	0.37	6	200	6	43068	
3	Welders	46	0.45	8	200	8	99360	
	Other Equipment?							
	Building - Interior/Architectural Coating	**Start Date:**	**11/18/2023**	**Total phase:**	**10**			
		End Date:	**12/1/2023**					
1	Air Compressors	78	0.48	6	10	6	2246	
	Aerial Lift	62	0.31			0	0	
	Other Equipment?							
	Paving	**Start Date:**	**12/2/2023**	**Total phase:**	**10**			
		Start Date:	**12/15/2023**					
1	Cement and Mortar Mixers	9	0.56	6	10	6	302	
1	Pavers	130	0.42	6	10	6	3276	**Asphalt? ___ cubic yards or _17___ round trips?**
1	Paving Equipment	132	0.36	8	10	8	3802	
1	Rollers	80	0.38	7	10	7	2128	
1	Tractors/Loaders/Backhoes	97	0.37	8	10	8	2871	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	

Equipment types listed in "Equipment Types" worksheet tab.

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

It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate

Modify horsepower or load factor, as appropriate

Complete one sheet for each project component

Construction Criteria Air Pollutants							
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	PM2.5 Fugitive	CO2e	
Year	Tons					MT	
Construction Equipment							
2023	0.31	1.40	0.06	0.06	0.01	217.75	
EMFAC							
2023	0.01	0.07	0.005	0.002	0.004	60.00	
Total Construction Emissions by Year							
2023	0.32	1.47	0.07	0.06		277.74	
	Total Construction Emissions						
Tons	0.32	1.47	0.07	0.06		277.74	
Pounds/Workdays	*Average Daily Emissions*					Workdays	
2023	2.55	11.77	0.53	0.49			**250**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**			
	Total Construction Emissions						
Pounds	2.55	11.77	0.53	0.49		0.00	
Average	2.55	11.77	0.53	0.49		0.00	250.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**			

Mitigated Construction Criteria Air Pollutants						
Mitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	M2.5 Fugitiv	CO2e
Year	Tons					MT
Construction Equipment						
2023-2024			0.02		0.005	
EMFAC						
2023-2024						
Total Construction Emissions by Year						
2023-2024	0.00	0.00	0.02	0.00	0.00	0.00
	Total Construction Emissions					
Tons	0.00	0.00	0.02	0.00		0.00

125 Kirk Avenue Subdivision

Unmitigated DPM

Year	CalEEMod DPM	DPM EMFAC2021	Unmitigated Emissions		CalEEMod Fug PM2.5	Fug PM2.5 EMFAC2021	Unmitigated Emissions
2023	0.0622	0.0002	0.0624		0.0107	0.0002	0.0109

Mitigated DPM

Year	CalEEMod DPM	DPM EMFAC2021	Mitigated Emissions		CalEEMod Fug PM2.5	Fug PM2.5 EMFAC2021	Mitigated Emissions
2023	0.0168	0.0002	0.0170		0.0048	0.0002	0.0050

Pavement demo

	sq in	sq ft	Cft	CY	Deliveries	Trips
Concrete		26600	26600	985.1852	118.2222	236
Asphalt		0	0	0	0	0
Asphalt Demo		0	0	0	0	0

Cement

	sq in	sq ft	Cft	CY	Deliveries	Trips
Concrete		54000	54000	2000	240	480
Asphalt		0	0	0	0	0
Asphalt Demo		0	0	0	0	0

Asphalt Paving

	sq in	sq ft	Cft	CY	Deliveries	Trips
Concrete		0	0	0	0	0
Asphalt		10000	2500	92.59259	11.11111	22
Asphalt Demo		0	0	0	0	0

Asphalt Demo

	sq in	sq ft	Cft	CY	Deliveries	Trips
Concrete		0	0	0	0	0
Asphalt		0	0	0	0	0
Asphalt Demo		4500	1125	41.66667	5	10

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

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Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	18.00	Dwelling Unit	1.49	18,000.00	51
Enclosed Parking Structure	36.00	Space	0.00	14,400.00	0
Parking Lot	9.00	Space	0.00	3,600.00	0
Other Asphalt Surfaces	12.75	1000sqft	0.00	12,750.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	San Jose Clean Energy				
CO2 Intensity (lb/MWhr)	178	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SJCE 2020 Rate = 178

Land Use - Total lot acreage provided from project description via email corespondece. Total number of parking spaces provided from provided Planning Comment Letter. Default square footage used for residential and parking. Est square footage used for private street

Construction Phase - Defaults

Off-road Equipment - Default

Off-road Equipment - Defaults

Off-road Equipment - Defaults

Off-road Equipment - Defaults

Off-road Equipment - Default

Off-road Equipment - Defaults

Date: 12/2/2022 12:49 PM

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

Off-road Equipment - default

Grading - Defaults. Est grading = 1,000-cy soil import, 1,000-cy soil export.

Demolition - Existing building demo = est 5,250-sf

Trips and VMT - EMFAC2021 adjustment 0 trips, existing pavement demo = 26,600-sf, building const = 240 concrete truck round trips, paving = 17 round trips of asphalt demo and asphalt paving

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	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
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

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

tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	PhaseEndDate	12/11/2023	12/1/2023
tblConstructionPhase	PhaseEndDate	11/13/2023	11/17/2023
tblConstructionPhase	PhaseEndDate	11/27/2023	12/15/2023
tblConstructionPhase	PhaseStartDate	11/28/2023	11/18/2023
tblConstructionPhase	PhaseStartDate	2/7/2023	2/11/2023
tblConstructionPhase	PhaseStartDate	11/14/2023	12/2/2023
tblGrading	MaterialExported	0.00	1,000.00
tblGrading	MaterialImported	0.00	1,000.00
tblLandUse	LotAcreage	1.13	1.49
tblLandUse	LotAcreage	0.32	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	0.29	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	CO2IntensityFactor	807.98	178
tblTripsAndVMT	HaulingTripNumber	24.00	0.00
tblTripsAndVMT	HaulingTripNumber	250.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00

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tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	26.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.309	1.4015	1.4859	2.6100e-003	0.0239	0.0622	0.0862	0.0107	0.0597	0.0704	0.0000	216.7366	216.7366	0.0404	0.0000	217.7454
Maximum	**0.3090**	**1.4015**	**1.4859**	**2.6100e-003**	**0.0239**	**0.0622**	**0.0862**	**0.0107**	**0.0597**	**0.0704**	**0.0000**	**216.7366**	**216.7366**	**0.0404**	**0.0000**	**217.7454**

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					

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

2023	0.1806	1.1449	1.6094	2.6100e-003	0.0108	0.0168	0.0276	4.81E-03	0.0168	0.0216	0.0000	216.7363	216.7363	0.0404	0.0000	217.7451
Maximum	**0.1806**	**1.1449**	**1.6094**	**2.6100e-003**	**0.0108**	**0.0168**	**0.0276**	**4.8100e-003**	**0.0168**	**0.0216**	**0.0000**	**216.7363**	**216.7363**	**0.0404**	**0.0000**	**217.7451**

	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	**41.57**	**18.31**	**-8.32**	**0.00**	**54.97**	**73.00**	**67.99**	**54.96**	**71.87**	**69.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2023**	**4-1-2023**	0.4443	0.2987
2	**4-2-2023**	**7-1-2023**	0.4301	0.3378
3	**7-2-2023**	**9-30-2023**	0.4301	0.3378
		Highest	0.4443	0.3378

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2023	1/27/2023	5	20	
2	Site Preparation	Site Preparation	1/28/2023	1/31/2023	5	2	
3	Grading	Grading	2/1/2023	2/6/2023	5	4	
4	Trenching	Trenching	2/7/2023	2/10/2023	5	4	
5	Building Construction	Building Construction	2/11/2023	11/17/2023	5	200	
6	Architectural Coating	Architectural Coating	11/18/2023	12/1/2023	5	10	
7	Paving	Paving	12/2/2023	12/15/2023	5	10	

Acres of Grading (Site Preparation Phase): 2

Acres of Grading (Grading Phase): 4

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Acres of Paving: 0

Residential Indoor: 36,450; Residential Outdoor: 12,150; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 1,845 (Architectural

OffRoad Equipment

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

Trips and VMT

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

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.5800e-003	0.0000	2.5800e-003	3.9000e-004	0.0000	3.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0147	0.1432	0.1346	2.4000e-004		6.7700e-003	6.7700e-003		6.3300e-003	6.3300e-003	0.0000	21.0866	21.0866	5.3500e-003	0.0000	21.2202
Total	**0.0147**	**0.1432**	**0.1346**	**2.4000e-004**	**2.5800e-003**	**6.7700e-003**	**9.3500e-003**	**3.9000e-004**	**6.3300e-003**	**6.7200e-003**	**0.0000**	**21.0866**	**21.0866**	**5.3500e-003**	**0.0000**	**21.2202**

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

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1600e-003	0.0000	1.1600e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6300e-003	0.0854	0.1542	2.4000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	21.0865	21.0865	5.3500e-003	0.0000	21.2202
Total	**4.6300e-003**	**0.0854**	**0.1542**	**2.4000e-004**	**1.1600e-003**	**3.7000e-004**	**1.5300e-003**	**1.8000e-004**	**3.7000e-004**	**5.5000e-004**	**0.0000**	**21.0865**	**21.0865**	**5.3500e-003**	**0.0000**	**21.2202**

Mitigated Construction Off-Site

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

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

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.0800e-003	0.0000	7.0800e-003	3.4200e-003	0.0000	3.4200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	0.0145	8.7000e-003	2.0000e-005		6.0000e-004	6.0000e-004		5.6000e-004	5.6000e-004	0.0000	1.8104	1.8104	5.9000e-004	0.0000	1.8250
Total	**1.3300e-003**	**0.0145**	**8.7000e-003**	**2.0000e-005**	**7.0800e-003**	**6.0000e-004**	**7.6800e-003**	**3.4200e-003**	**5.6000e-004**	**3.9800e-003**	**0.0000**	**1.8104**	**1.8104**	**5.9000e-004**	**0.0000**	**1.8250**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1900e-003	0.0000	3.1900e-003	1.5400e-003	0.0000	1.5400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7000e-004	6.3600e-003	0.0121	2.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	1.8104	1.8104	5.9000e-004	0.0000	1.8250
Total	**3.7000e-004**	**6.3600e-003**	**0.0121**	**2.0000e-005**	**3.1900e-003**	**3.0000e-005**	**3.2200e-003**	**1.5400e-003**	**3.0000e-005**	**1.5700e-003**	**0.0000**	**1.8104**	**1.8104**	**5.9000e-004**	**0.0000**	**1.8250**

Mitigated Construction Off-Site

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

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

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	6.8700e-003	0.0000	6.8700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6700e-003	0.0289	0.0174	4.0000e-005		1.2100e-003	1.2100e-003		1.1100e-003	1.1100e-003	0.0000	3.6208	3.6208	1.1700e-003	0.0000	3.6501
Total	**2.6700e-003**	**0.0289**	**0.0174**	**4.0000e-005**	**0.0143**	**1.2100e-003**	**0.0155**	**6.8700e-003**	**1.1100e-003**	**7.9800e-003**	**0.0000**	**3.6208**	**3.6208**	**1.1700e-003**	**0.0000**	**3.6501**

Unmitigated Construction Off-Site

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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					
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					6.4300e-003	0.0000	6.4300e-003	3.0900e-003	0.0000	3.0900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4000e-004	0.0127	0.0243	4.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	3.6208	3.6208	1.1700e-003	0.0000	3.6501
Total	**7.4000e-004**	**0.0127**	**0.0243**	**4.0000e-005**	**6.4300e-003**	**7.0000e-005**	**6.5000e-003**	**3.0900e-003**	**7.0000e-005**	**3.1600e-003**	**0.0000**	**3.6208**	**3.6208**	**1.1700e-003**	**0.0000**	**3.6501**

Mitigated Construction Off-Site

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

3.5 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8000e-004	6.1700e-003	0.0110	2.0000e-005		3.0000e-004	3.0000e-004		2.8000e-004	2.8000e-004	0.0000	1.4569	1.4569	4.7000e-004	0.0000	1.4687
Total	**6.8000e-004**	**6.1700e-003**	**0.0110**	**2.0000e-005**		**3.0000e-004**	**3.0000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**1.4569**	**1.4569**	**4.7000e-004**	**0.0000**	**1.4687**

Unmitigated Construction Off-Site

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	7.2700e-003	0.0125	2.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	1.4569	1.4569	4.7000e-004	0.0000	1.4686
Total	**2.7000e-004**	**7.2700e-003**	**0.0125**	**2.0000e-005**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**1.4569**	**1.4569**	**4.7000e-004**	**0.0000**	**1.4686**

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					

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

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

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1523	1.1710	1.2611	2.2100e-003		0.0515	0.0515		0.0497	0.0497	0.0000	181.5991	181.5991	0.0308	0.0000	182.3701
Total	**0.1523**	**1.1710**	**1.2611**	**2.2100e-003**		**0.0515**	**0.0515**		**0.0497**	**0.0497**	**0.0000**	**181.5991**	**181.5991**	**0.0308**	**0.0000**	**182.3701**

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

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

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	0.0401	0.9992	1.3479	2.2100e-003		0.0162	0.0162		0.0162	0.0162	0.0000	181.5989	181.5989	0.0308	0.0000	182.3698
Total	**0.0401**	**0.9992**	**1.3479**	**2.2100e-003**		**0.0162**	**0.0162**		**0.0162**	**0.0162**	**0.0000**	**181.5989**	**181.5989**	**0.0308**	**0.0000**	**182.3698**

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**

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1331					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.6000e-004	6.5100e-003	9.0600e-003	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2785
Total	**0.1341**	**6.5100e-003**	**9.0600e-003**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2785**

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**

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

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	0.1331					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	5.3000e-003	9.1600e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2785
Total	**0.1334**	**5.3000e-003**	**9.1600e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2785**

Mitigated Construction Off-Site

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

3.8 Paving - 2023

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2200e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

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

125 Kirk Ave Subdivision, San Jose - Santa Clara County, Annual

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0700e-003	0.0286	0.0493	7.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0700e-003**	**0.0286**	**0.0493**	**7.0000e-005**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

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**

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	13	0	260	0	260	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	2808	0	5200
Site Preparation	10	0	20	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	216	0	0
Grading	10	0	40	0	250	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	432	0	5000
Trenching	5	0	20	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	216	0	0
Building Construction	26	7	5200	1400	480	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	56160	10220	3504
Architectural Coating	5	0	50	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	540	0	0
Paving	13	0	130	0	34	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	1404	0	248.2

Number of Days Per Year					
2023	1/2/23	12/15/23	348	250	
			348	**250**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	1/2/2023	1/27/2023	5	20
Site Preparation	1/28/2023	1/31/2023	5	2
Grading	2/1/2023	2/6/2023	5	4
Trenching	2/7/2023	2/10/2023	5	4
Building Construction	2/11/2023	11/17/2023	5	200
Architectural Coating	11/18/2023	12/1/2023	5	10
Paving	12/2/2023	12/15/2023	5	10

Summary of Construction Traffic Emissions (EMFAC2021)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2	CH4	N2O	CO2e
					Tons							*Metric Tons*		
Criteria Pollutants														
2023	0.0099	0.0694	0.1202	0.0006	0.0283	0.0046	0.0329	0.0043	0.0019	0.0062	57.9207	0.0036	0.0067	59.9973
Toxic Air Contaminants (0.5 Mile Trip Length)														
2023	0.0083	0.0193	0.0399	0.0000	0.0013	0.0002	0.0016	0.0002	0.0001	0.0003	4.7196	0.0010	0.0008	4.9710

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Y	Vehicle Ca	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	NOx RUN	NOx IDLE	NOx STRE	PM2.5 RU	PM2.5 IDL	PM2.5 STI	PM2.5 PM	PM10 RU	PM10 IDL	PM10 STR	PM10 PM	PM10 PM	CO2 RUN	CO2 IDLE	CO2 STRE	CH4 RUN	CH4 IDLE	CH4 STRE	N2O RUN	N2O IDLE	N2O STRE	ROG RUN	ROG IDLE	ROG STRE	ROG HOT	ROG RUN	ROG DIUR	TOG RUN	TOG IDLE	TOG STRE	TOG HOT	TOG RUN	TOG DIUR	NH3 RUN	CO RUNEX	CO_IDLEX	CO_STREX	SOx RUNEX	SOx IDLEX	SOx_STREX
Santa Clara	2023	HHDT	Aggregate	Aggregate	Gasoline	3.45401	114.309	114.309	0	69.1078	8.10787	0	1.6025	0.00493	0	0.0017	0.005	0.03527	0.00536	0	0.00185	0.02	0.10076	2306.82	0	49.8119	0.34023	0	0.00018	0.20891	0	0.0457	2.10487	0	0.00098	0.15837	1.42664	10.6538	3.07142	0	0.00107	0.15837	1.42664	10.6538	0.04047	83.0074	0	1.02738	0.02281	0	0.00049
Santa Clara	2023	HHDT	Aggregate	Aggregate	Diesel	8235.06	991289	991289	0	120861	1.96937	63.4049	2.84946	0.02596	0.03163	0	0.00877	0.02753	0.02713	0.03306	0	0.03508	0.07866	1656.8	12241.3	0	0.00081	0.23745	0	0.26103	1.92863	0	0.01742	5.11216	0	0	0	0	0.01983	5.8198	0	0	0	0	0.21462	0.08739	74.2014	0	0.01569	0.11592	0
Santa Clara	2023	HHDT	Aggregate	Aggregate	Electricity	6.70171	411.505	0	411.505	103.204	0	0	0	0	0	0	0.00874	0.01338	0	0	0	0.03496	0.03824	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	2023	HHDT	Aggregate	Aggregate	Natural Ga	753.737	53296	53296	0	6914.03	1.20884	13.9283	0	0.00177	0.02424	0	0.009	0.04673	0.00193	0.02636	0	0.036	0.13351	1398.51	10630.2	0	2.44811	37.4467	0	0.2851	2.16704	0	0.05457	0.57226	0	0	0	0	2.5208	38.2595	0	0	0	0	0.86011	13.7825	74.0396	0	0	0	0
Santa Clara	2023	LDA	Aggregate	Aggregate	Gasoline	601938	2.2E+07	2.2E+07	0	2795479	0.04741	0	0.27189	0.00122	0	0.00199	0.002	0.00266	0.00132	0	0.00217	0.008	0.00759	281.43	0	71.6648	0.0026	0	0.07645	0.005	0	0.03413	0.01016	0	0.35379	0.09476	0.24061	1.48055	0.01482	0	0.38736	0.09476	0.24061	1.48055	0.03378	0.78762	0	3.43661	0.00278	0	0.00071
Santa Clara	2023	LDA	Aggregate	Aggregate	Diesel	1871.12	56220.8	56220.8	0	8000.53	0.23832	0	0	0.01856	0	0	0.002	0.0027	0.0194	0	0	0.008	0.00771	234.426	0	0	0.00141	0	0	0.03693	0	0	0.03042	0	0	0	0	0	0	0.03463	0	0	0	0.0031	0.34246	0	0	0.00222	0	0
Santa Clara	2023	LDA	Aggregate	Aggregate	Electricity	53751.1	2268185	0	2268185	265250	0	0	0	0	0	0	0.002	0.00153	0	0	0	0.008	0.00438	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	2023	LDA	Aggregate	Aggregate	Plug-in Hy	15805.3	700611	356650	343961	65355	0.00334	0	0.11551	0.00066	0	0.00217	0.002	0.00137	0.00072	0	0.00236	0.008	0.00392	142.11	0	66.0887	0.00046	0	0.0426	0.00061	0	0.02092	0.00144	0	0.17328	0.04064	0.03609	0.44706	0.00211	0	0.18973	0.04064	0.03609	0.44706	0.01971	0.21991	0	1.33989	0.0014	0	0.00065
Santa Clara	2023	LDT1	Aggregate	Aggregate	Gasoline	53782.3	1744480	1744480	0	239738	0.14329	0	0.40434	0.00185	0	0.00284	0.002	0.00324	0.00201	0	0.00308	0.008	0.00925	332.654	0	88.3113	0.00699	0	0.11256	0.01026	0	0.03983	0.03122	0	0.58321	0.17414	0.50309	2.80701	0.04555	0	0.63854	0.17414	0.50309	2.80701	0.03577	1.55341	0	5.66004	0.00329	0	0.00087
Santa Clara	2023	LDT1	Aggregate	Aggregate	Diesel	26.0471	391.87	391.87	0	75.1774	1.65906	0	0	0.24041	0	0	0.002	0.00373	0.25128	0	0	0.008	0.01065	415.548	0	0	0.01393	0	0	0.06547	0	0	0.29985	0	0	0	0	0	0	0.34136	0	0	0	0.0031	1.6014	0	0	0.00394	0	0
Santa Clara	2023	LDT1	Aggregate	Aggregate	Electricity	194.894	7068.18	0	7068.18	916.483	0	0	0	0	0	0	0.002	0.00154	0	0	0	0.008	0.0044	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	2023	LDT1	Aggregate	Aggregate	Plug-in Hy	43.2768	2048.37	944.158	1104.21	178.949	0.00302	0	0.11551	0.00039	0	0.00141	0.002	0.00138	0.00042	0	0.00153	0.008	0.00395	128.765	0	70.8664	0.00041	0	0.04244	0.00054	0	0.02076	0.00131	0	0.17328	0.02458	0.02178	0.28592	0.00191	0	0.18973	0.02458	0.02178	0.28592	0.01936	0.19958	0	1.33989	0.00127	0	0.0007
Santa Clara	2023	LDT2	Aggregate	Aggregate	Gasoline	280180	1E+07	1E+07	0	1311796	0.07721	0	0.35835	0.00126	0	0.002	0.002	0.00313	0.00138	0	0.00218	0.008	0.00893	348.396	0	89.5445	0.00312	0	0.08776	0.00638	0	0.03865	0.01242	0	0.41073	0.08512	0.22419	1.4049	0.01812	0	0.44969	0.08512	0.22419	1.4049	0.03554	0.89682	0	3.8921	0.00344	0	0.00089
Santa Clara	2023	LDT2	Aggregate	Aggregate	Diesel	978.497	36936.9	36936.9	0	4673.4	0.04616	0	0	0.00543	0	0	0.002	0.0031	0.00568	0	0	0.008	0.00886	313.067	0	0	0.00065	0	0	0.04932	0	0	0.01398	0	0	0	0	0	0	0.01592	0	0	0	0.0031	0.1321	0	0	0.00297	0	0
Santa Clara	2023	LDT2	Aggregate	Aggregate	Electricity	1105.88	38931.7	0	38931.7	5663.05	0	0	0	0	0	0	0.002	0.00152	0	0	0	0.008	0.00436	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	2023	LDT2	Aggregate	Aggregate	Plug-in Hy	1696.55	77270.7	37142.7	40128	7015.23	0.00315	0	0.11551	0.0005	0	0.00176	0.002	0.00138	0.00055	0	0.00191	0.008	0.00394	134.254	0	77.036	0.00043	0	0.04246	0.00057	0	0.02078	0.00136	0	0.17328	0.02624	0.02445	0.31823	0.00199	0	0.18973	0.02624	0.02445	0.31823	0.02014	0.20798	0	1.33989	0.00133	0	0.00076
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Gasoline	19181	711085	711085	0	285768	0.19781	0.03737	0.66588	0.00159	0	0.00033	0.002	0.0273	0.00173	0	0.00036	0.008	0.078	889.742	120.266	25.8396	0.00948	0.11564	0.03452	0.01108	0.00301	0.05189	0.04766	0.42815	0.17223	0.05056	0.2776	2.91378	0.06954	0.62476	0.18857	0.05056	0.2776	2.91378	0.04487	1.22511	3.75343	3.08025	0.0088	0.00119	0.00026
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Diesel	9807.46	384085	384085	0	123366	1.78063	2.02927	0	0.03825	0.02697	0	0.003	0.0273	0.03998	0.02819	0	0.012	0.078	635.427	132.908	0	0.00862	0.0051	0	0.10011	0.02094	0	0.18565	0.10976	0	0	0	0	0.21135	0.12495	0	0	0	0.16551	0.51888	0.90975	0	0.00602	0.00126	0
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Gasoline	2494.38	90793	90793	0	37162.6	0.18702	0.03682	0.64206	0.00145	0	0.00026	0.002	0.03185	0.00157	0	0.00028	0.008	0.091	997.384	138.797	25.7233	0.00707	0.11457	0.03346	0.01097	0.00297	0.05045	0.03305	0.42203	0.16561	0.04699	0.25097	2.6763	0.04822	0.61583	0.18132	0.04699	0.25097	2.6763	0.04497	0.96189	3.75941	3.11931	0.00986	0.00137	0.00025
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Diesel	4479.53	176769	176769	0	56346.9	1.41694	1.99826	0	0.03418	0.02703	0	0.003	0.03185	0.03572	0.02825	0	0.012	0.091	764.504	212.121	0	0.00782	0.0051	0	0.12045	0.03342	0	0.16845	0.10976	0	0	0	0	0.19177	0.12495	0	0	0	0.17898	0.44054	0.90975	0	0.00724	0.00201	0
Santa Clara	2023	MCY	Aggregate	Aggregate	Gasoline	27894.5	164895	164895	0	55789	0.58693	0	0.14237	0.00178	0	0.00341	0.001	0.0042	0.0019	0	0.00363	0.004	0.012	188.309	0	49.5981	0.16762	0	0.18748	0.04022	0	0.00838	1.10592	0	1.39264	3.5601	3.74568	3.94787	1.32414	0	1.51387	3.5601	3.74568	3.94787	0.00876	13.0896	0	8.0512	0.00186	0	0.00049
Santa Clara	2023	MDV	Aggregate	Aggregate	Gasoline	153799	5358084	5358084	0	712434	0.11759	0	0.47011	0.00129	0	0.00214	0.002	0.00319	0.0014	0	0.00233	0.008	0.00911	422.679	0	109.033	0.00441	0	0.11029	0.00848	0	0.04308	0.01883	0	0.55926	0.10198	0.2858	1.72733	0.02744	0	0.61231	0.10198	0.2858	1.72733	0.03543	1.06733	0	4.33325	0.00418	0	0.00108
Santa Clara	2023	MDV	Aggregate	Aggregate	Diesel	2374.92	86834.4	86834.4	0	11267.1	0.0531	0	0	0.00515	0	0	0.002	0.00318	0.00538	0	0	0.008	0.00909	411.163	0	0	0.00053	0	0	0.06478	0	0	0.0114	0	0	0	0	0	0.01297	0	0	0	0.0031	0.20259	0	0	0.0039	0	0
Santa Clara	2023	MDV	Aggregate	Aggregate	Electricity	1130.12	40073.7	0	40073.7	5799.83	0	0	0	0	0	0	0.002	0.00152	0	0	0	0.008	0.00435	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	2023	MDV	Aggregate	Aggregate	Plug-in Hy	986.09	41899.1	20787.3	21111.8	4077.48	0.00326	0	0.11551	0.00064	0	0.00215	0.002	0.00138	0.00069	0	0.00234	0.008	0.00393	138.532	0	96.6849	0.00044	0	0.04226	0.00058	0	0.02059	0.00141	0	0.17328	0.02985	0.02806	0.35962	0.00205	0	0.18973	0.02985	0.02806	0.35962	0.02084	0.21448	0	1.33989	0.00137	0	0.00096
Santa Clara	2023	MH	Aggregate	Aggregate	Gasoline	2522.74	22546.9	22546.9	0	252.375	0.47913	0	0.41252	0.00178	0	0.00043	0.003	0.01576	0.00194	0	0.00047	0.012	0.04502	1948.24	0	31.8758	0.01815	0	0.03803	0.02809	0	0.04265	0.08225	0	0.16378	13.0399	0.30297	4.77362	0.12002	0	0.17932	13.0399	0.30297	4.77362	0.04474	2.11194	0	3.62938	0.01926	0	0.00032
Santa Clara	2023	MH	Aggregate	Aggregate	Diesel	959.158	9344.85	9344.85	0	95.9158	4.26955	0	0	0.09791	0	0	0.004	0.01567	0.10233	0	0	0.016	0.04479	1081.43	0	0	0.0057	0	0	0.17038	0	0	0.12281	0	0	0	0	0	0.13981	0	0	0	0	0.15001	0.41028	0	0	0.01025	0	0
Santa Clara	2023	MHDT	Aggregate	Aggregate	Gasoline	1418.7	70785.9	70785.9	0	28385.4	0.56286	0.0883	0.45305	0.00139	0	0.00055	0.003	0.01576	0.00151	0	0.0006	0.012	0.04502	1792.41	536.966	47.1992	0.01807	0.25459	0.04939	0.02638	0.00706	0.03257	0.09086	1.01002	0.27957	0.03719	0.30238	3.03792	0.13258	1.47383	0.30609	0.03719	0.30238	3.03792	0.04497	1.90969	15.0852	6.15628	0.01772	0.00531	0.00047
Santa Clara	2023	MHDT	Aggregate	Aggregate	Diesel	10273.6	431550	431550	0	122419	1.33734	13.5724	1.62416	0.01652	0.03574	0	0.003	0.01594	0.01726	0.03736	0	0.012	0.04555	1151.56	2263.79	0	0.00172	0.0123	0	0.18143	0.35666	0	0.03705	0.26478	0	0	0	0	0.04218	0.30143	0	0	0	0.20901	0.13257	7.58339	0	0.0109	0.02144	0
Santa Clara	2023	MHDT	Aggregate	Aggregate	Electricity	4.74984	101.802	0	101.802	59.6458	0	0	0	0	0	0	0.003	0.00799	0	0	0	0.012	0.02283	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	2023	MHDT	Aggregate	Aggregate	Natural Ga	83.841	4047.87	4047.87	0	762.81	0.14132	6.52743	0	0.00114	0.01765	0	0.003	0.016	0.00124	0.01919	0	0.012	0.04572	989.385	5296.53	0	0.74006	17.5916	0	0.20169	1.07973	0	0.01057	0.25135	0	0	0	0	0.75528	17.9536	0	0	0	1.06	2.99271	33.6434	0	0	0	0
Santa Clara	2023	OBUS	Aggregate	Aggregate	Gasoline	458.897	20830.1	20830.1	0	9181.62	0.55308	0.06499	0.40562	0.00089	0	0.00026	0.003	0.01568	0.00097	0	0.00029	0.012	0.0448	1784.09	381.846	31.8944	0.01581	0.19494	0.03628	0.02618	0.00525	0.03077	0.07811	0.74523	0.1923	0.03471	0.15404	2.76625	0.11398	1.08744	0.21055	0.03471	0.15404	2.76625	0.04492	1.74396	5.76837	4.0717	0.01764	0.00377	0.00032
Santa Clara	2023	OBUS	Aggregate	Aggregate	Diesel	870.421	61645.7	61645.7	0	8910.75	1.20319	7.4101	1.5414	0.02032	0.00863	0	0.003	0.01802	0.02124	0.00902	0	0.012	0.05148	1282.54	1552.95	0	0.00199	0.02057	0	0.02026	0.24467	0	0.04286	0.44283	0	0	0	0	0.04879	0.56413	0	0	0	0.21586	0.15345	7.51086	0	0.01214	0.01471	0
Santa Clara	2023	OBUS	Aggregate	Aggregate	Natural Ga	6.1456	409.547	409.547	0	54.6958	0.21932	1.54911	0	0.00092	0.00362	0	0.003	0.01615	0.001	0.00394	0	0.012	0.04614	1017.4	1188.28	0	0.77407	4.38127	0	0.2074	0.24224	0	0.01106	0.0626	0	0	0	0	0.78999	4.4714	0	0	0	1.06	3.21195	6.7242	0	0	0	0
Santa Clara	2023	SBUS	Aggregate	Aggregate	Gasoline	166.987	8309.31	8309.31	0	667.947	0.51932	0.9257	0.7051	0.00086	0	0.00056	0.002	0.01572	0.00094	0	0.00061	0.008	0.04492	815.091	2602.03	58.6695	0.01187	2.46208	0.07492	0.02773	0.08622	0.0649	0.05774	10.6294	0.42706	0.11222	0.2593	1.59144	0.08426	15.5104	0.46758	0.11222	0.2593	1.59144	0.045	1.46951	82.1675	10.5643	0.00806	0.02572	0.00058
Santa Clara	2023	SBUS	Aggregate	Aggregate	Diesel	667.118	15392.7	15392.7	0	9659.88	4.02801	22.3986	0.46716	0.02091	0.02125	0	0.003	0.01572	0.02185	0.02221	0	0.012	0.04492	1148.52	2237.81	0	0.00275	0.00808	0	0.18095	0.35257	0	0.05916	0.17402	0	0	0	0	0.06735	0.19811	0	0	0	0.14415	0.18149	4.58185	0	0.01088	0.02119	0
Santa Clara	2023	SBUS	Aggregate	Aggregate	Electricity	0.30237	3.51049	0	3.51049	4.37836	0	0	0	0	0	0	0.003	0.00786	0	0	0	0.012	0.02246	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	2023	SBUS	Aggregate	Aggregate	Natural Ga	23.5076	595.871	595.871	0	340.39	0.58732	5.2827	0	0.00338	0.01108	0	0.003	0.01572	0.00367	0.01205	0	0.012	0.04492	1271.13	4058.81	0	3.49061	15.4024	0	0.25913	0.82742	0	0.04987	0.22007	0	0	0	0	3.56242	15.7193	0	0	0	1.06	11.9028	20.112	0	0	0	0
Santa Clara	2023	UBUS	Aggregate	Aggregate	Gasoline	45.9471	4798.24	4798.24	0	183.788	0.02681	0	0.44344	0.00114	0	0.00013	0.002	0.03185	0.00124	0	0.00014	0.008	0.091	926.292	0	36.8461	0.00203	0	0.04171	0.00421	0	0.07015	0.00561	0	0.14784	0.03814	0.09212	0.4568	0.00819	0	0.16187	0.03814	0.09212	0.4568	0.045	0.57113	0	6.07379	0.00916	0	0.00036
Santa Clara	2023	UBUS	Aggregate	Aggregate	Diesel	436.668	48829.7	48829.7	0	1746.67	0.38626	0	0	0.00702	0	0	0.0083	0.0385	0.00734	0	0	0.0332	0.11	1100.96	0	0	0.00321	0	0	0.17346	0	0	0.06921	0	0	0	0	0	0.07879	0	0	0	0	0.18785	0.07937	0	0	0.01043	0	0
Santa Clara	2023	UBUS	Aggregate	Aggregate	Electricity	5.04676	199.003	0	199.003	20.187	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
Santa Clara	2023	UBUS	Aggregate	Aggregate	Natural Ga	42.2611	4829.67	4829.67	0	169.045	0.05878	0	0	0.00028	0	0	0.00818	0.0385	0.0003	0	0	0.03273	0.11	1299.13	0	0	4.24574	0	0	0.26484	0	0	0.06066	0	0	0	0	0	4.33309	0	0	0	0	0.97	49.0423	0	0	0	0	0

Category		Mix %	Adj	ROG_DIURN	ROG_HTSK	ROG_IDLEX	ROG_RESTL	ROG_RUNEX	ROG_RUNLS	ROG_STREX	NOX_IDLEX	NOX_RUNEX	NOX_STREX	CO_IDLEX	CO_RUNEX	CO_STREX	SO2_IDLEX	SO2_RUNEX	SO2_STREX	Road Dust PM10	PM10_PMBW	PM10_PMTW	PM10_IDLEX	PM10_RUNEX	PM10_STREX	Road Dust PM25	PM25_PMBW	PM25_PMTW	PM25_IDLEX	PM25_RUNEX	PM25_STREX	CO2_NBIO_IDLEX	CO2_NBIO_RUNEX	CO2_NBIO_STREX	CH4_IDLEX	CH4_RUNEX	CH4_STREX	N2O_IDLEX	N2O_RUNEX	N2O_STREX
																														19	22	23	8	9	10						
Hauling	HHDT	100.0	1	0.000287604	8.55424E-05	0.332404817	0	0.01953334	0.00077057	5.28839E-07	4.1629787	1.930480649	2.692504026	5.211988	0.7948148	0.000555	0.0074608	0.01488345	2.65981E-07		0.081444	0.035123	0.002283	0.025833	9.98684E-07		0.028506	0.008781	0.002179	0.0247116	9.18E-07	850.51039	1643.0479	0.0269048	0.235881	0.125647179	9.74075E-08	0.136898	0.262148415	2.4682E-05
	MHD	0.0	0	0.028424515	0.006961572	0.027529656	0	0.04434978	0.05660825	0.052337336	0.9240436	1.219274528	1.396113281	0.673566	0.4037701	1.152494	0.0015021	0.011767743	8.73526E-05	0.299	0.045469	0.012	0.002542	0.014931	0.000112942	0.04499	0.015914	0.003	0.002431	0.0142769	0.000104	161.33734	1239.5984	8.8359741	0.012943	0.009906777	0.009245497	0.024829	0.159885109	0.00609652
Vendor	HHDT	50.0	0.5	0.000143802	4.27712E-05	0.166202408	0	0.00976667	0.00038529	2.6442E-07	2.0814893	0.965240325	1.346252013	2.605994	0.3974074	0.000277	0.0037304	0.007441725	1.32991E-07		0.040722	0.017561	0.001142	0.012916	4.99342E-07		0.014253	0.00439	0.001089	0.0123558	4.59E-07	425.2552	821.52395	0.0134524	0.11794	0.06282359	4.87037E-08	0.068449	0.131074208	1.2341E-05
	MHD	50.0	0.5	0.014212257	0.003480786	0.013764828	0	0.02217489	0.02830413	0.026168668	0.4620218	0.609637264	0.698056641	0.336783	0.2018851	0.576247	0.0007511	0.005883871	4.36763E-05		0.022735	0.006	0.001271	0.007465	5.64711E-05		0.007957	0.0015	0.001216	0.0071384	5.19E-05	80.66867	619.79918	4.417987	0.006471	0.004953388	0.004622749	0.012414	0.079942554	0.00304826
			1	0.01435606	0.003523557	0.179967236	0	0.03194156	0.02868941	0.026168932	2.5435111	1.574877589	2.044308654	2.942777	0.5992925	0.576524	0.0044815	0.013325596	4.38093E-05	0.299	0.063457	0.023561	0.002413	0.020382	5.69705E-05	0.04499	0.02221	0.00589	0.002305	0.0194942	5.24E-05	505.92387	1441.3231	4.4314394	0.124412	0.067776978	0.004622797	0.080863	0.211016762	0.0030606
Worker	LDA	50.0	0.5	0.143306127	0.042683769	0	0	0.0045285	0.10768412	0.159592017	0	0.021192179	0.122461753	0	0.3503116	1.546631	0	0.001247244	0.00032278		0.0036	0.004	0	0.000614	0.000990927		0.00126	0.001	0	0.0005655	0.000911	0	126.17319	32.650143	0	0.001154545	0.034539145	0	0.00224937	0.01544107
	LDT1	25.0	0.25	0.156677436	0.04332923	0	0	0.00778025	0.12516577	0.145126689	0	0.035722679	0.100614187	0	0.3863947	1.408382	0	0.000818289	0.000217331		0.002307	0.002	0	0.000514	0.000767762		0.000807	0.0005	0	0.0004735	0.000706	0	82.773349	21.983712	0	0.00173807	0.028010471	0	0.00255413	0.00991395
	LDT2	25.0	0.25	0.074138692	0.021036563	0	0	0.00307324	0.05534742	0.101569939	0	0.019062039	0.088569484	0	0.2213791	0.96209	0	0.000853405	0.000219425		0.002219	0.002	0	0.000345	0.000540097		0.000777	0.0005	0	0.0003173	0.000497	0	86.33608	22.19552	0	0.000769908	0.021709383	0	0.001616766	0.00956276
			1	0.374122256	0.107049562	0	0	0.015382	0.28819731	0.406288645	0	0.075976897	0.311645425	0	0.9580854	3.917103	0	0.002918938	0.000759537	0.299	0.008126	0.008	0	0.001473	0.002298785	0.04499	0.002844	0.002	0	0.0013563	0.002114	0	295.28262	76.829375	0	0.003662524	0.084258998	0	0.006420266	0.03491778

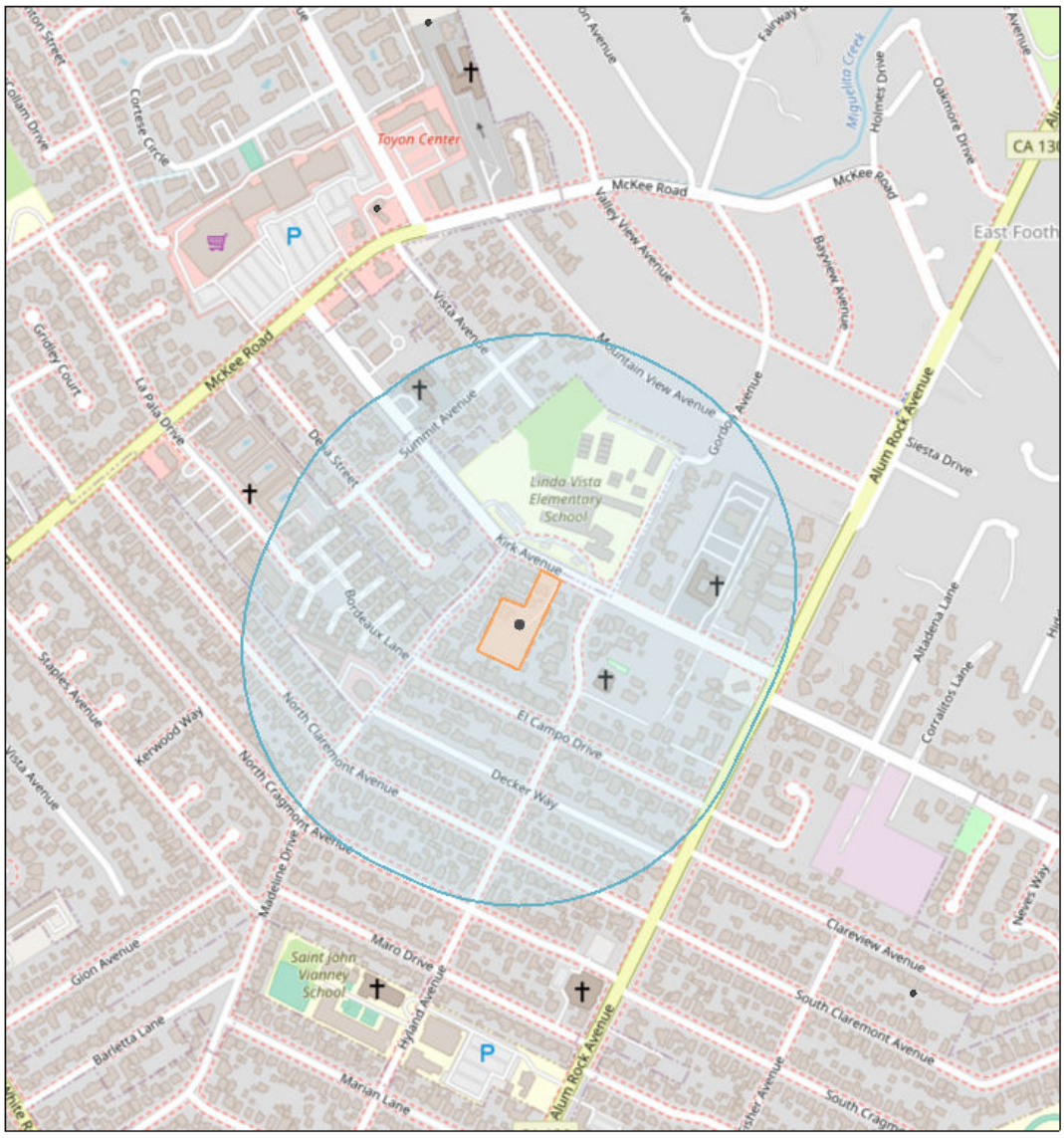
Attachment 4: Project Construction Emissions and Health Risk Calculations

Screening Report

Area of Interest (AOI) Information

Area : 4,371,933.26 ft²

Jan 5 2023 11:23:13 Pacific Standard Time



Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Stationary Sources	0	N/A	N/A

NOTE: A larger buffer than 1000 feet may be warranted depending on proximity to significant sources.

Attachment 4: Project Construction Emissions and Health Risk Calculations

125 Kirk Avenue Subdivision, San Jose, CA
Construction Emissions

Unmitigated DPM

Year	CalEEMod DPM	DPM EMFAC2021	Unmitigated Emissions		CalEEMod Fug PM2.5	Fug PM2.5 EMFAC2021	Unmitigated Emissions
2023	0.0622	0.0002	0.0624		0.0107	0.0002	0.0109

Mitigated DPM

Year	CalEEMod DPM	DPM EMFAC2021	Mitigated Emissions		CalEEMod Fug PM2.5	Fug PM2.5 EMFAC2021	Mitigated Emissions
2023	0.0168	0.0002	0.0170		0.0048	0.0002	0.0050

125 Kirk Avenue Subdivision, San Jose, CA

DPM Construction Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2023	Construction	0.06244	Point	116	124.9	0.05337	6.72E-03	**5.80E-05**
		hr/day =	9	(8am - 5pm)				
		days/yr =	260					
		hours/year =	2340					

125 Kirk Avenue Subdivision, San Jose, CA

PM2.5 Fugitive Dust Construction 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)	DPM Emission Rate $g/s/m^2$
2023	Construction	FUG	0.01090	21.8	0.00932	1.17E-03	6,004	**1.96E-07**
		hr/day =	9	(8am - 5pm)				
		days/yr =	260					
		hours/year =	2340					

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2023	Construction	0.01704	Point	116	34.1	0.01456	1.84E-03	**1.58E-05**
		hr/day =	9	(8am - 5pm)				
		days/yr =	260					
		hours/year =	2340					

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate $g/s/m^2$
2023	Construction	FUG	0.00501	10.0	0.00428	5.40E-04	6,004	**8.99E-08**
		hr/day =	9	(8am - 5pm)				
		days/yr =	260					
		hours/year =	2340					

125 Kirk Avenue Subdivision, San Jose, CA
Construction Health Impacts Summary

Maximum Impacts at Residential Construction MEI Location - Unmitigated

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.1167	0.1100	20.76	0.34	0.023	0.20

Note:
The maximum cancer risk and PM2.5 concentration occur at different receptor locations.
Maximum cancer risk and PM2.5 concentration occur at the first floor level (1.5 meter receptor height)

Maximum Impacts at Residential Construction MEI Location - With Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0319	0.0505	5.66	0.09	0.006	0.07

Note:
The maximum cancer risk and PM2.5 concentration occur at different receptor locations.
Maximum cancer risk and PM2.5 concentration occur at the first floor level (1.5 meter receptor height)

125 Kirk Avenue Subdivision, San Jose, CA - Uncontrolled Emissions
Maximum DPM Cancer Risk Calculations From Construction
Impacts at Off-Site Receptors-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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child Cancer Risk	Adult - Exposure Information			Adult Cancer Risk	Maximum	
			DPM Conc (ug/m3)		Age Sensitivity		Modeled DPM Conc (ug/m3)		Age Sensitivity		Fugitive	Total
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Factor**	**(per million)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
0	0.25	-0.25 - 0*	2023	0.1167	10	1.59	-	-	-	-		
1	1	0 - 1	2023	0.1167	10	19.17	2023	0.1167	1	0.34	0.1100	0.199
2	1	1 - 2	2024	0.0000	10	0.00	2024	0.0000	1	0.00		
3	1	2 - 3	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
4	1	3 - 4	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
5	1	4 - 5	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
6	1	5 - 6	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
7	1	6 - 7	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
8	1	7 - 8	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
9	1	8 - 9	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
10	1	9 - 10	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
11	1	10 - 11	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
12	1	11 - 12	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
13	1	12 - 13	2035	0.0000	3	0.00	2035	0.0000	1	0.00		
14	1	13 - 14	2036	0.0000	3	0.00	2036	0.0000	1	0.00		
15	1	14 - 15	2037	0.0000	3	0.00	2037	0.0000	1	0.00		
16	1	15 - 16	2038	0.0000	3	0.00	2038	0.0000	1	0.00		
17	1	16-17	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
18	1	17-18	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
19	1	18-19	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
20	1	19-20	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
21	1	20-21	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
22	1	21-22	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
23	1	22-23	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
24	1	23-24	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
25	1	24-25	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
26	1	25-26	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
27	1	26-27	2049	0.0000	1	0.00	2049	0.0000	1	0.00		
28	1	27-28	2050	0.0000	1	0.00	2050	0.0000	1	0.00		
29	1	28-29	2051	0.0000	1	0.00	2051	0.0000	1	0.00		
30	1	29-30	2052	0.0000	1	0.00	2052	0.0000	1	0.00		
Total Increased Cancer Risk						**20.76**				**0.34**		

* Third trimester of pregnancy

125 Kirk Avenue Subdivision, San Jose, CA - Controlled Emissions
Maximum DPM Cancer Risk Calculations From Construction
Impacts at Off-Site Receptors-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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult	Maximum	
					Age	Cancer	Modeled		Age	Cancer		
Exposure	Exposure Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2023	0.0319	10	0.43	-	-	-	-		
1	1	0 - 1	2023	0.0319	10	5.23	2023	0.0319	1	0.09	0.0505	0.075
2	1	1 - 2	2024	0.0000	10	0.00	2024	0.0000	1	0.00		
3	1	2 - 3	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
4	1	3 - 4	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
5	1	4 - 5	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
6	1	5 - 6	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
7	1	6 - 7	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
8	1	7 - 8	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
9	1	8 - 9	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
10	1	9 - 10	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
11	1	10 - 11	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
12	1	11 - 12	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
13	1	12 - 13	2035	0.0000	3	0.00	2035	0.0000	1	0.00		
14	1	13 - 14	2036	0.0000	3	0.00	2036	0.0000	1	0.00		
15	1	14 - 15	2037	0.0000	3	0.00	2037	0.0000	1	0.00		
16	1	15 - 16	2038	0.0000	3	0.00	2038	0.0000	1	0.00		
17	1	16-17	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
18	1	17-18	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
19	1	18-19	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
20	1	19-20	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
21	1	20-21	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
22	1	21-22	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
23	1	22-23	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
24	1	23-24	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
25	1	24-25	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
26	1	25-26	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
27	1	26-27	2049	0.0000	1	0.00	2049	0.0000	1	0.00		
28	1	27-28	2050	0.0000	1	0.00	2050	0.0000	1	0.00		
29	1	28-29	2051	0.0000	1	0.00	2051	0.0000	1	0.00		
30	1	29-30	2052	0.0000	1	0.00	2052	0.0000	1	0.00		
Total Increased Cancer Risk						**5.66**				**0.09**		

* Third trimester of pregnancy

125 Kirk Avenue Subdivision, San Jose, CA - Uncontrolled Emissions
Maximum DPM Cancer Risk Calculations From Construction
Impacts at Off-Site Receptors- 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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child Cancer Risk	Adult - Exposure Information			Adult Cancer Risk	Maximum	
			DPM Conc (ug/m3)		Age Sensitivity		Modeled DPM Conc (ug/m3)		Age Sensitivity		Fugitive	Total
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Factor**	**(per million)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
0	0.25	-0.25 - 0*	2023	0.0779	10	1.06	-	-	-	-		
1	1	0 - 1	2023	0.0779	10	12.79	2023	0.0779	1	0.22	0.0236	0.100
2	1	1 - 2	2024	0.0000	10	0.00	2024	0.0000	1	0.00		
3	1	2 - 3	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
4	1	3 - 4	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
5	1	4 - 5	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
6	1	5 - 6	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
7	1	6 - 7	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
8	1	7 - 8	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
9	1	8 - 9	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
10	1	9 - 10	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
11	1	10 - 11	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
12	1	11 - 12	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
13	1	12 - 13	2035	0.0000	3	0.00	2035	0.0000	1	0.00		
14	1	13 - 14	2036	0.0000	3	0.00	2036	0.0000	1	0.00		
15	1	14 - 15	2037	0.0000	3	0.00	2037	0.0000	1	0.00		
16	1	15 - 16	2038	0.0000	3	0.00	2038	0.0000	1	0.00		
17	1	16-17	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
18	1	17-18	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
19	1	18-19	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
20	1	19-20	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
21	1	20-21	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
22	1	21-22	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
23	1	22-23	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
24	1	23-24	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
25	1	24-25	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
26	1	25-26	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
27	1	26-27	2049	0.0000	1	0.00	2049	0.0000	1	0.00		
28	1	27-28	2050	0.0000	1	0.00	2050	0.0000	1	0.00		
29	1	28-29	2051	0.0000	1	0.00	2051	0.0000	1	0.00		
30	1	29-30	2052	0.0000	1	0.00	2052	0.0000	1	0.00		
Total Increased Cancer Risk						**13.85**				**0.22**		

* Third trimester of pregnancy