CORONA STATION AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

Petaluma, California

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Introduction

The purpose of this report is to address air quality, community health risk, and greenhouse gas (GHG) impacts associated with the Corona Station project at located south of the Sonoma-Marin Rail Transit (SMART) rail tracks at the northeast corner of N. McDowell Boulevard and Corona Road in Petaluma, California. The project proposes to develop 67 townhomes and 45 single-family homes on a 5-acre site. An additional one-acre portion of the property would be allocated for a SMART parking area. The project would provide a total of 188 parking spaces.

The air quality impacts from this project would be associated with demolition of the existing uses at the site, construction of the new buildings and infrastructure, and operation of the project. Air pollutants and GHG emissions associated with construction and operation of the project were predicted using models. In addition, the potential construction health risk impact to nearby sensitive receptors and the impact of existing toxic air contaminant (TAC) sources affecting the proposed residences were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Setting

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

Air Pollutants of Concern

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

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

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

Toxic Air Contaminants

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

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

Regulatory Agencies

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.[2] The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the CARB (a part of the California Environmental Protection Agency [EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[3] The detailed community risk modeling methodology used in this assessment is contained in *Attachment 1*.

City of Petaluma General Plan 2025

The City of Petaluma General Plan 2025 includes policies and programs to reduce exposure of the City's sensitive population to exposure of air pollution and TACs. The following policies and programs are applicable to the proposed project:

[2] Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed: November 21, 2014.
[3] Bay Area Air Quality Management District. 2017. *BAAQMD CEQA Air Quality Guidelines*. May.

4-P-15 Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces & gas powered lawn mowers) which cumulatively emit large quantities of emissions.

A. Continue to work with the Bay Area Air Quality Management District to achieve emissions reductions for non-attainment pollutants; including carbon monoxide, ozone, and PM10, by implementation of air pollution control measures as required by State and federal statutes. The BAAQMD's CEQA Guidelines should be used as the foundation for the City's review of air quality impacts under CEQA.

B. Continue to use Petaluma's development review process and the CEQA regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.

C. Continue to require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines. These measures would reduce exhaust and particulate emissions from construction and grading activities.

D. Reduce emissions from residential and commercial uses by requiring the following:

- Use of high efficiency heating and other appliances, such as cooking equipment, refrigerators, and furnaces, and low NOx water heaters in new and existing residential units;
- Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;
- Incorporation of passive solar building design and landscaping conducive to passive solar energy use for both residential and commercial uses, i.e., building orientation in a south to southeast direction, encourage planting of deciduous trees on west sides of structures, landscaping with drought resistant species, and use of groundcovers rather than pavement to reduce heat reflection;
- Encourage the use of battery-powered, electric, or other similar equipment that does not impact local air quality for nonresidential maintenance activities;
- Provide natural gas hookups to fireplaces or require residential use of EPA-certified wood stoves, pellet stoves, or fireplace inserts. Current building code standards generally ban the installation of open-hearth, wood burning fireplaces and wood stoves in new construction. It does, however, allow for the use of low-polluting wood stoves and inserts in fireplaces approved by the federal Environmental Protection Agency, as well as fireplaces fueled by natural gas.

4-P-16 To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts of the following requirements or measures shown to be equally effective:

- Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;
- Minimize idling time of construction related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;
- Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline);
- Use add-on control devices such as diesel oxidation catalysts or particulate filters;
- Use diesel equipment that meets the ARB's 2000 or newer certification standard for off-road heavy-duty diesel engines;
- Phase construction of the project;
- Limit the hours of operation of heavy duty equipment.

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. The closest sensitive receptors to the project site are single-family and mobile home residences south of the project site opposite N. McDowell Boulevard. There are additional residences east, south, and north of the project site at farther distances. The project would include new sensitive receptors.

Significance Thresholds

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

Table 1. Air Quality Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)**	
Excess Cancer Risk	>10 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^3	

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.

Construction & Operational Period Emissions: Criteria Air Pollutants

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

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from construction and operation of the site assuming full build-out of the project. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The model output from CalEEMod is included as *Attachment 2*.

Construction Period Emissions

CalEEMod provided annual emissions for construction. CalEEMod 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. A construction build-out scenario, including equipment list and schedule, was based on CalEEMod defaults for a project of this type and size.

The proposed project land uses were input into CalEEMod, which included: 112 dwelling units entered as "Single Family Housing" and 188 spaces entered as "Parking Lot". In addition, 7,000-sf of building demolition and 10,000 cubic yards (cy) of imported soil for the grading phase was entered into the model.

The construction schedule assumed that the project would be built out over a period of approximately 15 months, beginning in January 2019. Based on the CalEEMod default construction schedule and equipment usage assumptions, there were an estimated 320 construction workdays. Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 2 shows average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 2, predicted construction period emissions would not exceed the BAAQMD significance thresholds.

Table 2. Construction Period Emissions

Scenario	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Total construction emissions (tons)	2.1 tons	4.0 tons	0.2 tons	0.2 tons
Average daily emissions (pounds)[1]	**13.2 lbs./day**	**25.2 lbs./day**	**1.3 lbs./day**	**1.2 lbs./day**
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	**No**	**No**	**No**	**No**

[1]Assumes 320 workdays.

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

Operational Period Emissions

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

Land Uses

The project land uses were input to CalEEMod, as described above for the construction period modeling.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest the project could possibly be constructed and begin operating would be 2021. Emissions associated with build-out later than 2021 would be lower.

Traffic

CalEEMod allows the user to enter specific vehicle trip generation rates, which were input to the model using the daily trip generation rate provided in the project trip generation table, including a 5-percent reduction for transit.[4] For each land use type, the forecasted daily trip rate with trip reductions applied was divided by the quantity of that land use to identify the weekday daily trip rate. The Saturday and Sunday trip rates were assumed to be the weekday rate adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips. The project's average trip length of 4.73 miles and trip types specified by the traffic report were used. Since the traffic report trip generation and associated vehicle miles travelled for each trip were used, passby and diverted trips assumed in CalEEMod were set to 0 (i.e., all trips were assumed to be primary trips).

Energy

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. Indirect emissions from electricity were computed in CalEEMod. The model has a default rate of 641.3 pounds of CO_2 per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. The rate was adjusted to account for PG&E's projected 2020 CO_2 intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO_2 per megawatt of electricity delivered.[5]

Other Inputs

Wood-burning stoves and fireplaces are not allowed in new developments in the Bay Area; however, it was assumed that residential units could contain gas-powered fireplaces. Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project. Water/wastewater use were changed to 100% aerobic conditions to represent wastewater treatment plant conditions.

[4] W-Trans, *Draft Traffic Impact Study for the Corona Station Project*, November 2018.
[5] Pacific Gas & Electric, 2015. *Greenhouse Gas Emission Factors: Guidance for PG&E Customers*. November.

As shown in Table 3, operational emissions would not exceed the BAAQMD significance thresholds. This would be considered a *less-than-significant* impact.

Table 3. Operational Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2021 Project Operational Emissions (*tons/year*)	1.4 tons	1.6 tons	0.7 tons	0.2 tons
BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Threshold?	***No***	***No***	***No***	***No***
2021 Project Operational Emissions (*lbs/day*)[1]	7.9 lbs.	8.7 lbs.	3.6 lbs.	1.1 lbs.
BAAQMD Thresholds (pounds/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	***No***	***No***	***No***	***No***

Notes: [1] Assumes 365-day operation.

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

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

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

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

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

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

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

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

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

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

Effectiveness of Mitigation Measure AQ-1

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

Operational Community Risk Impacts

Project impacts related to increased community risk can occur either by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs or by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. The project would introduce new residents that are sensitive receptors. In addition, temporary project construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors. Community risk impacts are addressed by increased predicting lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations and computing the Hazard Index (HI) for non-cancer health risks. The methodology for computing community risks impacts is contained in *Attachment 1*.

Community health risk assessments typically look at all substantial sources of TACs that can affect new sensitive receptors that are located within 1,000 feet of a project site. These sources can include freeways or highways, busy surface streets, rail lines, and stationary sources identified by BAAQMD. Traffic on highways and high-volume roadways are a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadways. A review of the project area indicates that traffic on U.S. 101, N. McDowell Boulevard, and Corona Road would exceed 10,000 vehicles per day. Other nearby streets are assumed to have less than 10,000 vehicles per day. The northeastern project site boundary is adjacent to rail lines used by SMART for passenger rail service and Russian River Division Freight for freight service. A review of BAAQMD's stationary source Google Earth map tool identified two sources with the potential to affect the project site. Figure 1 shows all the sources affecting the project site. The roadway screening and stationary sources calculations are contained in *Attachment 3.*

Figure 1. Project Site and Nearby TAC and $PM_{2.5}$ Sources

Highway: U.S. 101

BAAQMD provides a *Highway Screening Analysis Google Earth Map* tool to identify estimated risk and hazard impacts from highways throughout the Bay Area. Cumulative risk, hazard, and $PM_{2.5}$ impacts at various distances from the highway are estimated for different segments of the highways. The tool uses the average annual daily traffic (AADT) count, fleet mix and other modeling parameters specific to that segment of the highway. Impacts from Link 738 (6ft elevation) for U.S. 101, in which the project site was approximately 1,000 feet north of U.S.101, were identified using this tool.

The cancer risk identified using the BAAQMD tool was adjusted using a factor of 1.3744 to account for new Office of Environmental Health Hazard Assessment (OEHHA) guidance. This factor was provided by BAAQMD for use with their CEQA screening tools that are used to predict cancer risk.[6] Estimated cancer risk from the highway traffic would be 7.0 per million and $PM_{2.5}$ concentration would be 0.05 micrograms per cubic meter ($\mu g/m^3$). Chronic or acute hazard index (HI) for the roadway would be less than 0.01. The predicted impacts from U.S. 101 do not exceed the BAAQMD thresholds of greater than 10 chances per million for cancer risk, 0.3 $\mu g/m^3$ for $PM_{2.5}$ exposure, and 1.0 for HI.

Roadway: N. McDowell Boulevard and Corona Road

For local roadways, BAAQMD has provided the *Roadway Screening Analysis Calculator* to assess whether roadways with traffic volumes of over 10,000 vehicles per day may have a potentially significant effect on a proposed project. Note this is a screening model and more refined modeling could be conducted if potentially significant impacts are identified. Two adjustments were made to the cancer risk predictions made by this calculator: (1) adjustment for latest vehicle emissions rates and (2) adjustment of cancer risk to reflect new OEHHA guidance (see *Attachment 1*).

The calculator uses EMFAC2011 emission rates for the year 2014. Overall, emission rates will decrease by the time the project is constructed and occupied. The project would not be occupied prior to at least 2018. A new version of the emissions factor model, EMFAC2014 is available. This version predicts lower emission rates. An adjustment factor of 0.5 was developed by comparing emission rates of total organic gases (TOG) for running exhaust and running losses developed using EMFAC2011 for year 2014 and those from EMFAC2014 for year 2018.

The predicted cancer risk was then adjusted using a factor of 1.3744 to account for new OEHHA guidance. This factor was provided by BAAQMD for use with their CEQA screening tools that are used to predict cancer risk.[7]

There are two local roadways with high traffic volumes near the project site, which include N. McDowell Boulevard and Corona Road. Average daily traffic (ADT) volumes were assessed using project traffic volume data for existing traffic data and including a 20 percent increase for future traffic conditions, assuming the ADT was ten times the average AM and PM peak-hour volume. Based on these projections both N. McDowell Boulevard and Corona Road have volumes greater than 10,000.

The ADT on Corona Road was estimated to be approximately 13,164. Using the BAAQMD *Roadway Screening Analysis Calculator* for Sonoma County for an east-west directional roadway and at a distance of approximately 150 feet south of the roadway, the estimated cancer risk at the closest project receptors would be 1.6 per million, $PM_{2.5}$ concentration would be 0.06 $\mu g/m^3$, and the chronic or acute HI for the roadway would be less than 0.01. The predicted impacts from Corona Road would not exceed the BAAQMD thresholds.

[6] Correspondence with Alison Kirk, BAAQMD, November 23, 2015.
[7] Correspondence with Alison Kirk, BAAQMD, November 23, 2015.

The ADT on N. McDowell Boulevard was estimated to be approximately 19,758. Using the BAAQMD *Roadway Screening Analysis Calculator* for Sonoma County for a north-south directional roadway and at a distance of approximately 25 feet east of the roadway, the estimated cancer risk at the closest project receptors would be 9.8 per million, $PM_{2.5}$ concentration would be 0.37 $\mu g/m^3$, and the chronic or acute HI for the roadway would be less than 0.01. The predicted impacts from N. McDowell Boulevard would not exceed the cancer risk and HI BAAQMD thresholds, but would exceed $PM_{2.5}$ concentration thresholds. Since these results are based on use of screening tools, a refined assessment was conducted.

Refined Roadway Impacts: N. McDowell Boulevard TAC Impacts

Since screening computations indicate increases in $PM_{2.5}$ concentrations from traffic on N. McDowell Boulevard would exceed the BAAQMD $PM_{2.5}$ concentration thresholds at the project dwelling units closest to N. McDowell Boulevard, a refined analysis of the impacts of TACs and $PM_{2.5}$ to new sensitive receptors is necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from N. McDowell Boulevard. Refined modeling of local roadways predicts more accurate results, because project specific information is used in the modeling. This includes roadway orientation with respect to receptors (i.e., where dwelling units would be located with respect to traffic), emission estimates (i.e., based on traffic speeds and traffic mix), and meteorological conditions near the project site.

The refined analysis of the impacts of TACs and $PM_{2.5}$ to new sensitive receptors is necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from N. McDowell Boulevard. This analysis involved the development of DPM, organic TAC, and $PM_{2.5}$ emissions for traffic on N. McDowell Boulevard using the CARB EMFAC2014 emission factor model and local traffic volume of 19,758 ADT.

Residential occupation of the project was assumed to begin in 2021 or thereafter. In order to estimate TAC and $PM_{2.5}$ emissions over a 30-year exposure period (2021-2050) for calculating increased cancer risks to new residents from traffic on N. McDowell Boulevard, the EMFAC2014 model was used to develop vehicle emission factors for the year 2021. Year 2021 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years), since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions will decrease in the future.

The EMFAC2014 model was used to develop vehicle emission factors for the year 2021 using an estimated mix of cars and trucks. N. McDowell Boulevard carries primarily cars and light-duty trucks. A truck mix of 4.32 percent was assumed based on BAAQMD recommendations for truck percentages on non-highway roads in Santa Clara County.[8] One-third of the trucks were assumed to be heavy duty trucks and two-thirds were assumed to be medium duty trucks. Default EMFAC2014 vehicle model fleet age distributions for Sonoma County were assumed in calculating the emissions. Average hourly traffic distributions for Sonoma County roadways were

[8] BAAQMD. 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. may

developed using the EMFAC model,[9] which were then applied to the project area traffic volumes to obtain estimated hourly traffic volumes and emissions. For all hours of the day and average travel speed of 35 mph (5 mph below the posted speed of 40 mph on N. McDowell) was assumed for all vehicles.

Emissions of total organic gases (TOG) from gasoline-powered vehicles were calculated using the EMFAC2014 model. These TOG emissions were then used in modeling the organic TACs (i.e., TACs associated with motor vehicle from TOG exhaust emissions and evaporative TOG emissions). TOG emissions from exhaust and for running evaporative loses from gasoline vehicles were calculated using EMFAC2014 default model values for Sonoma County along with the traffic volumes and vehicle mixes.

$PM_{2.5}$ emissions for vehicles traveling on N. McDowell Boulevard were modeled using the same basic modeling approach that was used for assessing TAC impacts. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included in these emissions. The assessment involved, first, calculating $PM_{2.5}$ emission rates from traffic traveling on the roadway. These emissions were calculated using the EMFAC2014 model and traffic volumes and were calculated in the same manner as discussed above. $PM_{2.5}$ re-entrained dust emissions from vehicles traffic were calculated using CARB emission calculation procedures.[10]

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD model, which is recommended by the BAAQMD for this type of analysis.[11] East and westbound traffic on N. McDowell Boulevard within about 1,000 feet of the project site were evaluated with the model. The modeling used a five-year data set (2013-2017) of hourly meteorological data for Petaluma that was prepared by *Lakes Environmental.* These data were developed using prognostic meteorological data from the Weather Research and Forecasting ("WRF") grid model for the Petaluma area and processed for use with AERMOD using the U.S. EPA Mesoscale Model Interface Program ("MMIF") following U.S. EPA guidance.

Other inputs to the model included road geometry, hourly traffic emissions, and receptor locations. The modeling used a grid of receptors placed every 10 meters (33 feet) within the proposed project residential areas. Receptor heights of 1.5 meters (5 feet) and 4.5 meters (15 feet) were used to represent the breathing heights of residents on the first and second floors of residential units. The maximum DPM and annual $PM_{2.5}$ concentration occurred at a first floor residential unit adjacent to N. McDowell Boulevard. Figure 1 shows the project site, residential area, roadway segments modeled and residential receptor locations that were used in the modeling.

[9] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2011 does not include Burden type output with hour by hour traffic volume information.
[10] CARB, 2014. *Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust*. Revised and updated, April 2014.
[11] BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.

The maximum increased lifetime cancer risks, non-cancer health effects (health hazard index), and annual $PM_{2.5}$ concentrations for new residents at the project site were computed using modeled TAC and $PM_{2.5}$ concentrations and the methods and exposure parameters described in *Attachment 1*. The maximum increased cancer risk from N. McDowell Boulevard traffic would be 2.8 in one million. The maximum $PM_{2.5}$ concentration would be 0.23 $\mu g/m^3$ and the maximum hazard index would be less than 0.01. These impacts would all be below their applicable BAAQMD significant impact thresholds. In general, cancer risks and $PM_{2.5}$ concentration will decrease with distance from the roadway and with height of the receptors.

The emission information, modeling results, and health risk calculations for the receptor with the maximum cancer risk from N. McDowell Boulevard traffic are provided in *Attachment 4*.

Figure 1. Project Site, On-Site Sensitive Receptors, Roadway Segments Modeled and On-Site Receptor with Maximum TAC Impacts

Railroad Community Risk Impacts

The SMART railroad lies about 30 feet from portions of the site that could include residences. SMART trains and freight trains use this rail line on a regular basis. Environmental studies were performed for each proposed use and used to predict risk levels from these activities.[12,13] Both studies predicted maximum risk levels for a position 30 feet from the rail line. Although these predictions are for positions closer than depicted for residential uses of the site, they were used as screening values for this analysis. It should be noted that freight trains are currently uncommon along this portion of the rail line. Both health risk studies for these environmental evaluations were conducted prior to BAAQMD's adoption of age-sensitivity factors, which account for the greater sensitivity of infants and small children to cancer-causing TACs. The levels predicted in each study were increased by a factor of 1.7 to account for the age-sensitivity factors and then a factor of 1.3744 was applied to that value to account for the new 2015 OEHHA guidelines. Concentration levels and community risk impacts from these sources upon the project are reported in Table 4.

Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Risk & Hazard Analysis Tool*. This mapping tool uses Google Earth and identified the location of four stationary sources and their estimated risk and hazard impacts. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. They provided updated risk levels, emissions and adjustments to account for new OEHHA guidance.[14] The adjusted risk values were then adjusted with the appropriate distance multiplier values provided by BAAQMD or the emissions information was used in refined modeling.

Two stationary sources were identified (Plant #118832 and #106677) with one source being diesel generators and the other source being gas dispensing facilities. The emissions data for all these stationary sources were provided by BAAQMD and adjusted for distance based on BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines* or *Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities* when appropriate. Concentration levels and community risk impacts from these sources upon the project are reported in Table 4.

Summary of Operational Impacts

Maximum excess cancer risks at the project site were calculated from the maximum modeled long-term average DPM concentrations using methods recommended by BAAQMD, described in *Attachment 1.* Details of the emission calculations, dispersion modeling and cancer risk calculations are contained in *Attachment 3*. Community risk impacts from these sources upon the project are reported in Table 4. All sources would not exceed the single-source or cumulative-source thresholds at the new project residences. This is a *less-than-significant* impact.

[12] Draft Environmental Impact Report (DEIR) for the North Coast Railroad Authority Project (SCH 2007072052)
[13] Supplemental Environmental Impact Report (SEIR) for the Sonoma-Marin Area Rail Transit Project (SCH 2002112033)
[14] Correspondence with Areana Flores, BAAQMD, September 10, 2018.

Table 4. Community Risk Impact to New Project Residences

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
U.S. 101 at 1,000 feet, Link 738 (6ft elevation)	7.0	0.05	<0.01
N. McDowell Blvd at 25 feet, ADT 19,758	2.8	0.23	<0.01
Corona Road at 150 feet, ADT 13,164	1.6	0.06	<0.01
Railroad line at 30 feet[1]	9.1	0.01	0.00
Plant #18832 (generator) at 480 feet	0.1	<0.01	<0.01
Plant #106677 (gas station) at 750 feet	0.2	N/A	<0.01
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Significant?	***No***	***No***	***No***
Cumulative Total	20.8	<0.36	<0.05
BAAQMD Cumulative Source Threshold	***>100***	***>0.8***	***>10.0***
Significant?	***No***	***No***	***No***

[1] Public Draft Environmental Impact Report North Coast Railroad Authority, Russian River Division Freight Rail Project and Sonoma-Marin Area Rail Transit Project Final Environmental Impact Report. Age-sensitivity factors were applied to the cancer risk predictions. These predictions were made at 30 feet from the tracks. Closest residences would be 30 feet or further.

Project Construction Activity

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[15] This assessment included dispersion modeling to predict the off-site concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod model provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages of 0.2014 tons (403 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.08643 tons (173 pounds) for the overall construction period.

[15] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[16] The modeling utilized two area sources to represent the on-site construction emissions, one for exhaust emissions and one for fugitive dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area source. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. to 4 p.m., when the majority of construction activity would occur.

The modeling used a five-year data set (2013-2017) of hourly meteorological data for Petaluma, as described above for the refined modeling of health impacts from N. McDowell Boulevard traffic. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2019-2020 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 1.5 meters (5 feet) were used to represent the breathing heights of residents in nearby mobile home and single-family residences.

Predicted Cancer Risk and Hazards

Figure 2 shows the location where the maximum-modeled DPM and $PM_{2.5}$ concentrations occurred. The maximum concentrations occurred at a future residence in the Brody Ranch subdivision northeast of the project site. Using the maximum annual modeled DPM concentration, the maximum increased cancer risk at the location of the maximally exposed individual (MEI) was calculated using BAAQMD recommended methods. The cancer risk calculations are based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. BAAQMD-recommended exposure parameters were used for the cancer risk calculations, as described in *Attachment 1*. Infant and adult exposures were assumed to occur at all residences through the entire construction period.

Results of this assessment indicate that the maximum increased residential cancer risks without any mitigation or construction emissions control would be 17.9 in one million for an infant exposure and 0.3 in one million for an adult exposure. The maximum residential excess cancer risk would be above the significance threshold of 10.0 in one million.

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

Predicted Annual $PM_{2.5}$ Concentration

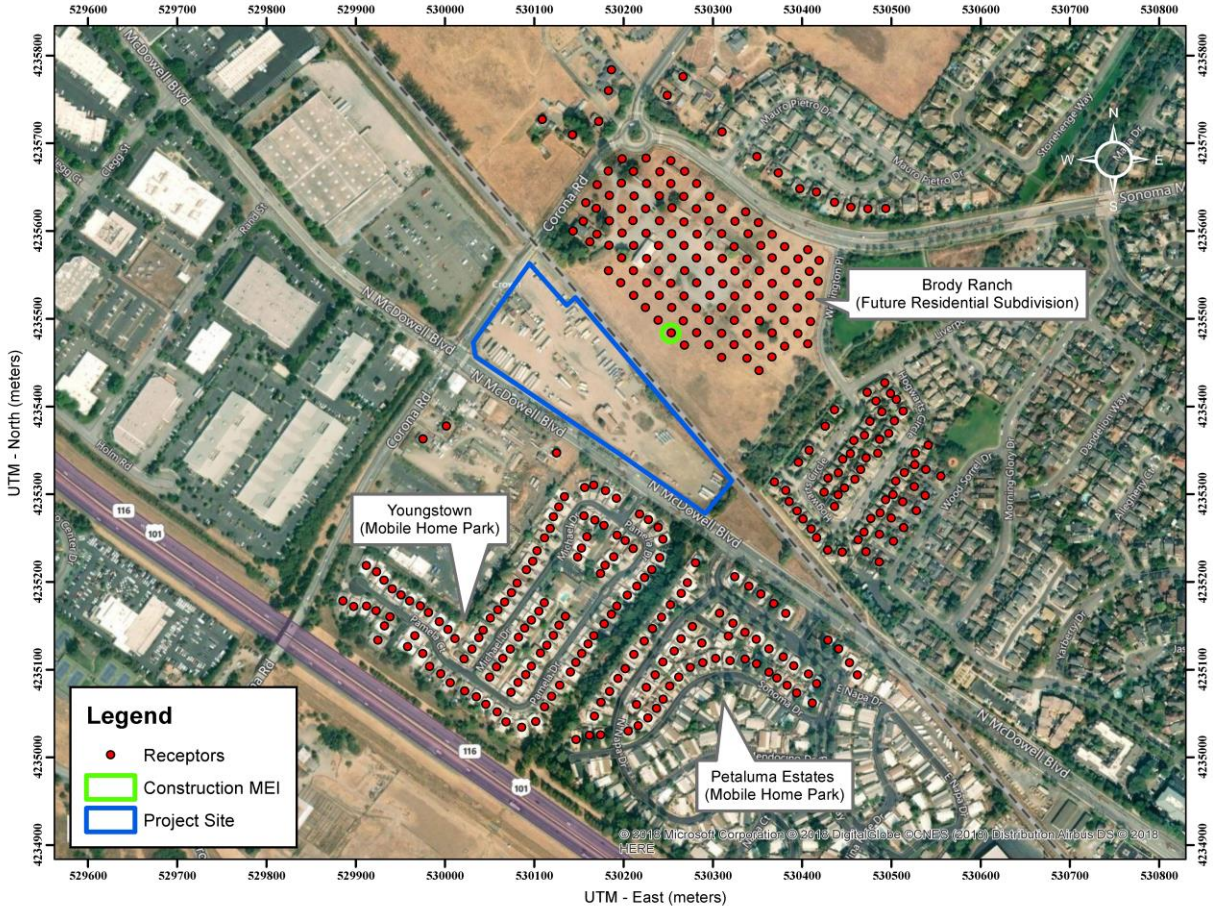
The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhaust and fugitive dust emissions, was 0.16 $\mu g/m^3$. This maximum annual $PM_{2.5}$ concentration would be below the BAAQMD significance threshold of greater than 0.3 $\mu g/m^3$.

Non-Cancer Hazards

The maximum modeled annual residential DPM concentration (i.e., from construction exhaust) was 0.1091 $\mu g/m^3$. The maximum computed HI based on this DPM concentration is 0.02, which does not the BAAQMD significance criterion of a HI greater than 1.0.

The project would have a *significant* impact with respect to community risk caused by project construction activities, since the maximum cancer risk is above the single-source thresholds of 10.0 per million. *Attachment 5* includes the construction emission calculations and source information used in the modeling and the cancer risk calculations.

Figure 2. Project Construction Site and Locations of Off-Site Sensitive Receptors and TAC Impacts



Mitigation Measure AQ-2: **Selection of equipment during construction to minimize emissions. Such equipment selection would include the following:**

The project shall develop a plan demonstrating that the off-road equipment used on-site to construct the project would achieve a fleet-wide average 45-percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following:

- All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 2 engines that include CARB-certified Level 3 Diesel Particulate Filters (DPF)[17] or equivalent. Equipment that meets U.S. EPA Tier 3 standards with DPF 3 filters for particulate matter or engines meeting Tier 4 particulate matter standards would meet this requirement.

Alternatively,

- All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 2 engines and

- Line power would be provided to limit the use of any portable diesel-powered equipment to 20 hours (e.g., generators, compressors, welders, etc.).

Effectiveness of Mitigation Measure AQ-2

Implementation of Mitigation Measure AQ-2 is considered to reduce fugitive dust emissions by over 75 percent and reduce on-site diesel exhaust emissions by 55 to 90 percent. This would reduce the infant cancer risk such that the mitigated risk would be less than 1.9 to 8.1 in one million and the maximum annual $PM_{2.5}$ concentration would be reduced to less than 0.1 $\mu g/m^3$, which are less than the BAAQMD significance thresholds. After implementation of these mitigation measures, the project would have a *less-than-significant* impact with respect to community risk caused by construction activities.

Cumulative Impact on Construction MEI

The cumulative impacts of TAC emissions from construction of the project, the stationary sources, rail emission, and traffic on U.S. 101, N McDowell Boulevard, and Corona Road on the construction MEI have been summarized in Table 5. As shown in Table 5, the sum of impacts from combined sources at the construction MEI would be *less-than-significant*.

[17] See http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

Table 5. Impacts from Combined Sources at Construction MEI

Source	Maximum Cancer Risk (per million)	$PM_{2.5}$ concentration ($\mu g/m^3$)	Hazard Index
Project Construction Unmitigated	**17.9 (infant)**	0.16	0.02
Mitigated[1]	8.0 to 1.9 (infant)	<0.10	<0.01
BAAQMD Threshold - Single Source	*10.0*	*0.3*	*1.0*
Exceed threshold?	**Yes (Unmitigated) No (Mitigated)**	**No**	**No**
U.S. 101 at 1,000 feet Link 738 (6ft elevation)	7.0	0.05	<0.01
N. McDowell Blvd at 450 feet, ADT 19,758	1.8	0.06	<0.01
Corona Road at 600 feet, ADT 13,164	0.6	0.02	<0.01
Railroad line at 100 feet[2]	<9.1	<0.01	0.00
Plant #18832 (generator) at 1,000 feet	<0.1	<0.01	<0.01
Plant #106677 (gas station) at 1,000 feet	0.1	NA	<0.01
Combined Sources Unmitigated	<36.6	<0.31	<0.07
Mitigated	<20.6-26.7	<0.25	<0.06
BAAQMD Threshold – Combined Sources	*100*	*0.8*	*10.0*
Exceed threshold?	**No**	**No**	**No**

[1] Depending on the level of mitigation implemented.

[2] Public Draft Environmental Impact Report North Coast Railroad Authority, Russian River Division Freight Rail Project and Sonoma-Marin Area Rail Transit Project Final Environmental Impact Report. Age-sensitivity factors were applied to the cancer risk predictions. These predictions were made at 30 feet from the tracks. Construction MEI residence would be 100 feet.

Greenhouse Gases Assessment

Setting

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

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

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

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

Recent Regulatory Actions

Assembly Bill 32 (AB 32), California Global Warming Solutions Act (2006)

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building

Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

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

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

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

SB 350 Renewable Portfolio Standards

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

Executive Order EO-B-30-15 (2015) and SB 32 GHG Reduction Targets

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

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-

term goal). Key features of this plan are:

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

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

Significance Thresholds

The BAAQMD's CEQA Air Quality Guidelines recommended a GHG threshold of 1,100 metric tons or 4.6 metric tons (MT) per capita. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur beyond 2020, so a threshold that addresses a future target is appropriate. Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO_2e/year/service population and a bright-line threshold of 660 MT CO_2e/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 by adjusting BAAQMD's recommended 2020 threshold for 2030, assuming a reduction of 40 percent in 1990 levels that are assumed to be similar to 2020 levels. The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_2e/year threshold.

Greenhouse Gas Emissions

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

CalEEMod Modeling

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

Service Population Emissions

The project service population efficiency rate is based on the number of future residents. Based on the project's proposed 112 residential units and using the latest population data from the California Department of Finance which reports the average persons per household in Petaluma is 2.72 persons,[18] the number of future residents is estimated to be 305.

Construction Emissions

GHG emissions associated with construction were computed to be 554 MT of CO_2e for the total construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable. Best management practices assumed to be incorporated into construction of the proposed project include but are not limited to: using local building materials of at least 10 percent and recycling or reusing at least 50 percent of construction waste or demolition materials.

Operational Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate daily emissions associated with operation of the fully-developed site under the proposed project. As shown in Table 6, annual emissions resulting from operation of the proposed project are predicted to be 1,148 MT of CO_2e for the year 2021 and 986 MT of CO_{2e} for the year 2030. The Service population emission for the year 2021 and 2030 are predicted to be 3.8 and 3.2 MT/CO_{2e}/year/service population, respectively. The project would exceed both the 2030 operational annual emissions bright-line threshold of 660 MT CO_2e/year and the service population emissions "Substantial Progress" efficiency metric of 2.8 MT CO_2e/year/service population. Therefore, the project will have a *significant* impact.

[18] State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011-2018*. Sacramento, California, May 2018.

Table 6. Annual Project GHG Emissions (CO_2e) in Metric Tons

Source Category	Proposed Project in 2021	Proposed Project in 2030	Mitigated Project in 2030
Area	11	11	11
Energy Consumption	298	298	144
Mobile	760	598	584
Solid Waste Generation	67	67	68
Water Usage	12	12	10
Total	1,148	986	816
Significance Threshold	***1,100 MT CO_2e/yr***	***660 MT CO_2e/yr***	***660 MT CO_2e/yr***
Service Population Emissions	3.8	3.2	2.68
Significance Threshold	***4.6 in 2020***	***2.8 in 2030***	***2.8 in 2030***
Significant?	***No***	***Yes***	***No***

Mitigation Measure GHG-1: **Develop and Implement Greenhouse Gas Reduction Plan**

A GHG reduction plan that includes the proper elements would reduce emissions from operation of the project shall be developed and demonstrate that GHG emission from the project would be reduced, such that the project would have GHG emissions not exceeding 660 MT of CO_2e/ year *or* 2.8 MT/capita/year in 2030. Elements of this plan may include, but would not be limited to, the following:

1. Installation of solar power systems or other renewable electric generating systems that provide electricity to power on-site equipment and possibly provide excess electric power;

2. Provide infrastructure for electric vehicle charging in residential units (i.e., provide 220 VAC power)

3. Develop and implement a transportation demand management (TDM) program to reduce mobile GHG emissions;

4. Incorporate pedestrian and bicycle circulation features;

5. Increase water conservation above State average conditions for residential uses;

6. Construct onsite or fund off-site carbon sequestration projects (such as a forestry or wetlands projects for which inventory and reporting protocols have been adopted). If the project develops an off-site project, it must be registered with the Climate Action Reserve or otherwise approved by the BAAQMD in order to be used to offset Project emissions;

7. Purchase of carbon credits to offset Project annual emissions. Carbon offset credits must be verified and registered with The Climate Registry, the Climate Action Reserve, or another source approved by the California Air Resources Board or BAAQMD. The preference for offset carbon credit purchases include those that can be achieved as follows: 1) within the City; 2) within the San Francisco Bay Area Air Basin; 3) within the

State of California; then 4) elsewhere in the United States. Provisions of evidence of payments, and funding of an escrow-type account or endowment fund would be overseen by the County.

Effectiveness of Mitigation Measure GHG-1

Implementation of Mitigation Measure GHG-1was evaluated by assuming measures 1 through 5 above were implemented such that energy usage would be increased by over 20 percent (e.g., meet future 2020 Title 24 building standards). Solar panels would be provided for each dwelling unit such that the project could off set all of the GHG emissions from electricity generation. Modeling with CalEEMod shows that emissions would be reduced to the 2030 threshold assuming these mitigation measures (#1 through 5).

Supporting Documentation

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

Attachment 2 includes the CalEEMod output for project construction and operational criteria air pollutant and GHG emissions. The operational output for 2030 project uses are also included in this attachment. Also included are any modeling assumptions.

Attachment 3 includes the screening community risk calculations from sources affecting the project site and construction MEI.

Attachment 4 includes the modeling results and health risk calculations for the receptor with the maximum cancer risk from N. McDowell Boulevard traffic.

Attachment 5 is the construction health risk assessment. AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 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.[19] 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.[20] This HRA used the recent 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.[21] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences). The modeling used a five-year data set (2013-2017) of hourly meteorological data for Petaluma that was prepared by *Lakes Environmental.* These data were developed using prognostic meteorological data from the Weather Research and Forecasting ("WRF") grid model for the Petaluma area and processed for use with AERMOD using the U.S. EPA Mesoscale Model Interface Program ("MMIF") following U.S. EPA guidance.

Recently, new U.S. EPA modeling guidelines (40 CFR Part 51, Appendix W, effective February 16, 2017) allows the use of prognostic meteorological data using the U.S. EPA's Mesoscale Model Interface Program ("MMIF") pre-processor to generate inputs for regulatory modeling applications using the meteorological preprocessor model ("AERMET") and AERMOD. Prognostic meteorological data can be used when (i) there is no representative National Weather Service station data available for use in developing AERMOD meteorological data, and (ii) site-specific data are not available. The U.S. EPA recommends using no fewer than three years of meteorological data for modeling when using prognostic modeled derived data for AERMOD. This new option now provides the opportunity to develop meteorological data suitable for AERMOD that are representative of the project site.

The Weather Research and Forecasting ("WRF") grid model was used to develop a 5-year data set (2013 through 2017) for meteorological conditions at the project site. The WRF model pulls in observations and archived meteorological model data from the region around the project site,

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

and uses the same physical equations that are used in weather forecasting to model the historical weather conditions at the specific project location. Development of this data set was performed by *Lakes Environmental* using the WRF model and the MMIF program to process data for input to the AERMOD meteorological data preprocessor, AERMET. The WRF modeling uses a nested grid with a 4-kilometer grid spacing at the highest resolution (inner grid).

Cancer Risk

Potential increased cancer risk from inhalation of TACs are 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 of exposure, and the exposure duration. 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). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

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 that would 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)
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 < 9	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	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	631	572	261
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults.

Non-Cancer Hazards

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 Output

18-120 Corona Station

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	188.00	Space	1.00	60,000.00	0
Single Family Housing	112.00	Dwelling Unit	5.00	236,440.00	320

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate = 290

Land Use - Applicant and Site Plan provided Land Uses

Construction Phase - Default construction schedule & Trenching

Off-road Equipment -

Off-road Equipment - Default Construction equipment & hours

Off-road Equipment - Trenching Equip Added

Trips and VMT -

Demolition - 7,000 sqft estimate from Google Earth

Grading - Applicant provided grading import 10,000cy

Vehicle Trips - Single Family House trip rate = 8.96, 9.34, 8.11 VMT = 4.73

Woodstoves - No Wood burning, All Gas

Water And Wastewater - WTP Treatment 100% Aerobic

Energy Mitigation - 20% improvement for Title 24 and efficient lighting, 100% on-site renewable energy

Water Mitigation - Install Low-Flow water utilities and irrigation

Energy Use -

Area Mitigation -

Mobile Land Use Mitigation - Implement NEV Network

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Construction Off-road Equipment Mitigation - BMPs, Tier 3 Electric crane & air compressors

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	28.00	76.16
tblFireplaces	NumberWood	48.16	0.00
tblGrading	MaterialImported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	75,200.00	60,000.00
tblLandUse	LandUseSquareFeet	201,600.00	236,440.00
tblLandUse	LotAcreage	1.69	1.00
tblLandUse	LotAcreage	36.36	5.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	4.73
tblVehicleTrips	HS_TL	4.80	4.73
tblVehicleTrips	HW_TL	10.80	4.73
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	9.91	9.34
tblVehicleTrips	SU_TR	8.62	8.11
tblVehicleTrips	WD_TR	9.52	8.96

tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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					
2019	0.3902	3.6616	2.7433	5.5000e-003	0.2435	0.1853	0.4288	0.1066	0.1735	0.2801	0.0000	495.0562	495.0562	0.0945	0.0000	497.4176
2020	1.7195	0.3680	0.3628	6.4000e-004	8.4700e-003	0.0194	0.0279	2.2900e-003	0.0182	0.0205	0.0000	56.5226	56.5226	0.0126	0.0000	56.8379
Maximum	**1.7195**	**3.6616**	**2.7433**	**5.5000e-003**	**0.2435**	**0.1853**	**0.4288**	**0.1066**	**0.1735**	**0.2801**	**0.0000**	**495.0562**	**495.0562**	**0.0945**	**0.0000**	**497.4176**

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					
2019	0.1362	2.2392	2.5957	5.5000e-003	0.1555	0.1118	0.2673	0.0416	0.1116	0.1531	0.0000	447.2202	447.2202	0.0793	0.0000	449.2031

2020	1.6942	0.2535	0.3551	6.4000e-004	8.4700e-003	0.0140	0.0225	2.2900e-003	0.0140	0.0163	0.0000	49.7555	49.7555	0.0111	0.0000	50.0318
Maximum	**1.6942**	**2.2392**	**2.5957**	**5.5000e-003**	**0.1555**	**0.1118**	**0.2673**	**0.0416**	**0.1116**	**0.1531**	**0.0000**	**447.2202**	**447.2202**	**0.0793**	**0.0000**	**449.2031**

	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	**13.24**	**38.14**	**5.00**	**0.00**	**34.90**	**38.58**	**36.55**	**59.73**	**34.51**	**43.65**	**0.00**	**9.90**	**9.90**	**15.59**	**0.00**	**9.93**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2019**	**3-31-2019**	1.3921	0.8037
2	**4-1-2019**	**6-30-2019**	0.8778	0.5183
3	**7-1-2019**	**9-30-2019**	0.8874	0.5240
4	**10-1-2019**	**12-31-2019**	0.8917	0.5282
5	**1-1-2020**	**3-31-2020**	2.0918	1.9508
		Highest	2.0918	1.9508

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1214	0.0179	0.8387	1.0000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	10.8696	10.8696	1.5100e-003	1.7000e-004	10.9592
Energy	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	295.6728	295.6728	0.0155	5.7100e-003	297.7620
Mobile	0.3040	1.4215	3.0392	8.2700e-003	0.6363	8.7900e-003	0.6451	0.1713	8.2600e-003	0.1795	0.0000	759.3421	759.3421	0.0368	0.0000	760.2631
Waste						0.0000	0.0000		0.0000	0.0000	27.2820	0.0000	27.2820	1.6123	0.0000	67.5900
Water						0.0000	0.0000		0.0000	0.0000	2.5818	7.3120	9.8938	9.6200e-003	5.7700e-003	11.8524
Total	**1.4429**	**1.5894**	**3.9417**	**9.3300e-003**	**0.6363**	**0.0262**	**0.6625**	**0.1713**	**0.0257**	**0.1969**	**29.8638**	**1,073.1965**	**1,103.0602**	**1.6758**	**0.0117**	**1,148.4266**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1214	0.0179	0.8387	1.0000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	10.8696	10.8696	1.5100e-003	1.7000e-004	10.9592
Energy	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
Mobile	0.3018	1.4038	2.9905	8.0800e-003	0.6205	8.6100e-003	0.6291	0.1670	8.0800e-003	0.1751	0.0000	742.0183	742.0183	0.0363	0.0000	742.9250
Waste						0.0000	0.0000		0.0000	0.0000	27.2820	0.0000	27.2820	1.6123	0.0000	67.5900
Water						0.0000	0.0000		0.0000	0.0000	2.0654	6.1440	8.2094	7.7200e-003	4.6200e-003	9.7789
Total	**1.4376**	**1.5449**	**3.8816**	**8.9700e-003**	**0.6205**	**0.0238**	**0.6443**	**0.1670**	**0.0233**	**0.1903**	**29.3474**	**901.7749**	**931.1223**	**1.6606**	**7.4100e-003**	**974.8443**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.37**	**2.80**	**1.52**	**3.86**	**2.49**	**8.94**	**2.75**	**2.49**	**9.12**	**3.35**	**1.73**	**15.97**	**15.59**	**0.91**	**36.39**	**15.11**

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	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Trenching	Trenching	2/12/2019	2/25/2019	5	10	
5	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
6	Paving	Paving	1/28/2020	2/24/2020	5	20	

7	Architectural Coating	Architectural Coating	2/25/2020	3/23/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 1

Residential Indoor: 478,791; Residential Outdoor: 159,597; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	32.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	66.00	22.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

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					3.4500e-003	0.0000	3.4500e-003	5.2000e-004	0.0000	5.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8672

Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**3.4500e-003**	**0.0180**	**0.0214**	**5.2000e-004**	**0.0167**	**0.0172**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8672**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	5.1700e-003	1.0600e-003	1.0000e-005	2.7000e-004	3.0000e-005	2.9000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.2451	1.2451	8.0000e-005	0.0000	1.2471
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	7.8000e-004	5.9000e-004	5.8400e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1190	1.1190	5.0000e-005	0.0000	1.1201
Total	**9.3000e-004**	**5.7600e-003**	**6.9000e-003**	**2.0000e-005**	**1.4500e-003**	**4.0000e-005**	**1.4800e-003**	**3.8000e-004**	**3.0000e-005**	**4.2000e-004**	**0.0000**	**2.3641**	**2.3641**	**1.3000e-004**	**0.0000**	**2.3672**

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					1.5500e-003	0.0000	1.5500e-003	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2500e-003	0.1831	0.2467	3.9000e-004		8.6300e-003	8.6300e-003		8.6300e-003	8.6300e-003	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8671
Total	**9.2500e-003**	**0.1831**	**0.2467**	**3.9000e-004**	**1.5500e-003**	**8.6300e-003**	**0.0102**	**1.2000e-004**	**8.6300e-003**	**8.7500e-003**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8671**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	5.1700e-003	1.0600e-003	1.0000e-005	2.7000e-004	3.0000e-005	2.9000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.2451	1.2451	8.0000e-005	0.0000	1.2471
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	7.8000e-004	5.9000e-004	5.8400e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1190	1.1190	5.0000e-005	0.0000	1.1201
Total	**9.3000e-004**	**5.7600e-003**	**6.9000e-003**	**2.0000e-005**	**1.4500e-003**	**4.0000e-005**	**1.4800e-003**	**3.8000e-004**	**3.0000e-005**	**4.2000e-004**	**0.0000**	**2.3641**	**2.3641**	**1.3000e-004**	**0.0000**	**2.3672**

3.3 Site Preparation - 2019

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

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	4.7000e-004	3.5000e-004	3.5000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.1000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6714	0.6714	3.0000e-005	0.0000	0.6721
Total	**4.7000e-004**	**3.5000e-004**	**3.5000e-003**	**1.0000e-005**	**7.1000e-004**	**1.0000e-005**	**7.1000e-004**	**1.9000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.6714**	**0.6714**	**3.0000e-005**	**0.0000**	**0.6721**

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					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6600e-003	0.0953	0.1148	1.9000e-004		4.7300e-003	4.7300e-003		4.7300e-003	4.7300e-003	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**4.6600e-003**	**0.0953**	**0.1148**	**1.9000e-004**	**0.0407**	**4.7300e-003**	**0.0454**	**0.0112**	**4.7300e-003**	**0.0159**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

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	4.7000e-004	3.5000e-004	3.5000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.1000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6714	0.6714	3.0000e-005	0.0000	0.6721

Total	**4.7000e-004**	**3.5000e-004**	**3.5000e-003**	**1.0000e-005**	**7.1000e-004**	**1.0000e-005**	**7.1000e-004**	**1.9000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.6714**	**0.6714**	**3.0000e-005**	**0.0000**	**0.6721**

3.4 Grading - 2019

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					0.0661	0.0000	0.0661	0.0338	0.0000	0.0338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	26.6423	26.6423	8.4300e-003	0.0000	26.8530
Total	**0.0258**	**0.2835**	**0.1629**	**3.0000e-004**	**0.0661**	**0.0140**	**0.0801**	**0.0338**	**0.0129**	**0.0466**	**0.0000**	**26.6423**	**26.6423**	**8.4300e-003**	**0.0000**	**26.8530**

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	5.8400e-003	0.2020	0.0413	5.0000e-004	0.0104	1.0000e-003	0.0114	2.8400e-003	9.6000e-004	3.8000e-003	0.0000	48.6366	48.6366	3.0900e-003	0.0000	48.7138
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	7.8000e-004	5.9000e-004	5.8400e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1190	1.1190	5.0000e-005	0.0000	1.1201
Total	**6.6200e-003**	**0.2026**	**0.0471**	**5.1000e-004**	**0.0116**	**1.0100e-003**	**0.0126**	**3.1500e-003**	**9.7000e-004**	**4.1200e-003**	**0.0000**	**49.7555**	**49.7555**	**3.1400e-003**	**0.0000**	**49.8339**

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					0.0297	0.0000	0.0297	7.6000e-003	0.0000	7.6000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2600e-003	0.1484	0.1899	3.0000e-004		7.5600e-003	7.5600e-003		7.5600e-003	7.5600e-003	0.0000	26.6422	26.6422	8.4300e-003	0.0000	26.8530
Total	**7.2600e-003**	**0.1484**	**0.1899**	**3.0000e-004**	**0.0297**	**7.5600e-003**	**0.0373**	**7.6000e-003**	**7.5600e-003**	**0.0152**	**0.0000**	**26.6422**	**26.6422**	**8.4300e-003**	**0.0000**	**26.8530**

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	5.8400e-003	0.2020	0.0413	5.0000e-004	0.0104	1.0000e-003	0.0114	2.8400e-003	9.6000e-004	3.8000e-003	0.0000	48.6366	48.6366	3.0900e-003	0.0000	48.7138
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	7.8000e-004	5.9000e-004	5.8400e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1190	1.1190	5.0000e-005	0.0000	1.1201
Total	**6.6200e-003**	**0.2026**	**0.0471**	**5.1000e-004**	**0.0116**	**1.0100e-003**	**0.0126**	**3.1500e-003**	**9.7000e-004**	**4.1200e-003**	**0.0000**	**49.7555**	**49.7555**	**3.1400e-003**	**0.0000**	**49.8339**

3.5 Trenching - 2019

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	2.4700e-003	0.0251	0.0278	4.0000e-005		1.4300e-003	1.4300e-003		1.3100e-003	1.3100e-003	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**2.4700e-003**	**0.0251**	**0.0278**	**4.0000e-005**		**1.4300e-003**	**1.4300e-003**		**1.3100e-003**	**1.3100e-003**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.0000e-004	9.7000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1865	0.1865	1.0000e-005	0.0000	0.1867
Total	**1.3000e-004**	**1.0000e-004**	**9.7000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1865**	**0.1865**	**1.0000e-005**	**0.0000**	**0.1867**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0200e-003	0.0210	0.0313	4.0000e-005		1.2000e-003	1.2000e-003		1.2000e-003	1.2000e-003	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**1.0200e-003**	**0.0210**	**0.0313**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.0000e-004	9.7000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1865	0.1865	1.0000e-005	0.0000	0.1867
Total	**1.3000e-004**	**1.0000e-004**	**9.7000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1865**	**0.1865**	**1.0000e-005**	**0.0000**	**0.1867**

3.6 Building Construction - 2019

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	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0349	248.0349	0.0604	0.0000	249.5455
Total	**0.2491**	**2.2238**	**1.8108**	**2.8400e-003**		**0.1361**	**0.1361**		**0.1279**	**0.1279**	**0.0000**	**248.0349**	**248.0349**	**0.0604**	**0.0000**	**249.5455**

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	0.0117	0.3075	0.0815	6.2000e-004	0.0151	2.3900e-003	0.0174	4.3500e-003	2.2900e-003	6.6400e-003	0.0000	60.0349	60.0349	3.9900e-003	0.0000	60.1345
Worker	0.0362	0.0273	0.2709	5.8000e-004	0.0547	4.6000e-004	0.0551	0.0146	4.3000e-004	0.0150	0.0000	51.9426	51.9426	2.1100e-003	0.0000	51.9953
Total	**0.0478**	**0.3348**	**0.3524**	**1.2000e-003**	**0.0697**	**2.8500e-003**	**0.0726**	**0.0189**	**2.7200e-003**	**0.0216**	**0.0000**	**111.9775**	**111.9775**	**6.1000e-003**	**0.0000**	**112.1298**

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	0.0580	1.2478	1.6021	2.8400e-003		0.0857	0.0857		0.0857	0.0857	0.0000	200.1990	200.1990	0.0453	0.0000	201.3312
Total	**0.0580**	**1.2478**	**1.6021**	**2.8400e-003**		**0.0857**	**0.0857**		**0.0857**	**0.0857**	**0.0000**	**200.1990**	**200.1990**	**0.0453**	**0.0000**	**201.3312**

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	0.0117	0.3075	0.0815	6.2000e-004	0.0151	2.3900e-003	0.0174	4.3500e-003	2.2900e-003	6.6400e-003	0.0000	60.0349	60.0349	3.9900e-003	0.0000	60.1345
Worker	0.0362	0.0273	0.2709	5.8000e-004	0.0547	4.6000e-004	0.0551	0.0146	4.3000e-004	0.0150	0.0000	51.9426	51.9426	2.1100e-003	0.0000	51.9953
Total	**0.0478**	**0.3348**	**0.3524**	**1.2000e-003**	**0.0697**	**2.8500e-003**	**0.0726**	**0.0189**	**2.7200e-003**	**0.0216**	**0.0000**	**111.9775**	**111.9775**	**6.1000e-003**	**0.0000**	**112.1298**

3.6 Building Construction - 2020

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	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0030	22.0030	5.3700e-003	0.0000	22.1372
Total	**0.0201**	**0.1823**	**0.1601**	**2.6000e-004**		**0.0106**	**0.0106**		**9.9800e-003**	**9.9800e-003**	**0.0000**	**22.0030**	**22.0030**	**5.3700e-003**	**0.0000**	**22.1372**

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	8.2000e-004	0.0251	6.3300e-003	6.0000e-005	1.3500e-003	1.3000e-004	1.4900e-003	3.9000e-004	1.3000e-004	5.2000e-004	0.0000	5.3809	5.3809	3.3000e-004	0.0000	5.3891
Worker	2.9900e-003	2.1700e-003	0.0218	5.0000e-005	4.9200e-003	4.0000e-005	4.9600e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.5330	4.5330	1.7000e-004	0.0000	4.5371
Total	**3.8100e-003**	**0.0273**	**0.0282**	**1.1000e-004**	**6.2700e-003**	**1.7000e-004**	**6.4500e-003**	**1.7000e-003**	**1.7000e-004**	**1.8700e-003**	**0.0000**	**9.9139**	**9.9139**	**5.0000e-004**	**0.0000**	**9.9263**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.2200e-003	0.1124	0.1443	2.6000e-004		7.7200e-003	7.7200e-003		7.7200e-003	7.7200e-003	0.0000	17.7891	17.7891	4.0100e-003	0.0000	17.8892
Total	**5.2200e-003**	**0.1124**	**0.1443**	**2.6000e-004**		**7.7200e-003**	**7.7200e-003**		**7.7200e-003**	**7.7200e-003**	**0.0000**	**17.7891**	**17.7891**	**4.0100e-003**	**0.0000**	**17.8892**

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	8.2000e-004	0.0251	6.3300e-003	6.0000e-005	1.3500e-003	1.3000e-004	1.4900e-003	3.9000e-004	1.3000e-004	5.2000e-004	0.0000	5.3809	5.3809	3.3000e-004	0.0000	5.3891
Worker	2.9900e-003	2.1700e-003	0.0218	5.0000e-005	4.9200e-003	4.0000e-005	4.9600e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.5330	4.5330	1.7000e-004	0.0000	4.5371
Total	**3.8100e-003**	**0.0273**	**0.0282**	**1.1000e-004**	**6.2700e-003**	**1.7000e-004**	**6.4500e-003**	**1.7000e-003**	**1.7000e-004**	**1.8700e-003**	**0.0000**	**9.9139**	**9.9139**	**5.0000e-004**	**0.0000**	**9.9263**

3.7 Paving - 2020

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	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1902
Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0149**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**	**0.0000**	**20.0282**	**20.0282**	**6.4800e-003**	**0.0000**	**20.1902**

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	7.2000e-004	5.2000e-004	5.2200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0844	1.0844	4.0000e-005	0.0000	1.0854
Total	**7.2000e-004**	**5.2000e-004**	**5.2200e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0844**	**1.0844**	**4.0000e-005**	**0.0000**	**1.0854**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6100e-003	0.1130	0.1730	2.3000e-004		6.0900e-003	6.0900e-003		6.0900e-003	6.0900e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1901

Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.9200e-003**	**0.1130**	**0.1730**	**2.3000e-004**		**6.0900e-003**	**6.0900e-003**		**6.0900e-003**	**6.0900e-003**	**0.0000**	**20.0282**	**20.0282**	**6.4800e-003**	**0.0000**	**20.1901**

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	7.2000e-004	5.2000e-004	5.2200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0844	1.0844	4.0000e-005	0.0000	1.0854
Total	**7.2000e-004**	**5.2000e-004**	**5.2200e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0844**	**1.0844**	**4.0000e-005**	**0.0000**	**1.0854**

3.8 Architectural Coating - 2020

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4200e-003	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	**1.6793**	**0.0168**	**0.0183**	**3.0000e-005**		**1.1100e-003**	**1.1100e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**2.5533**	**2.5533**	**2.0000e-004**	**0.0000**	**2.5582**

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	6.2000e-004	4.5000e-004	4.5300e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.9399	0.9399	3.0000e-005	0.0000	0.9407
Total	**6.2000e-004**	**4.5000e-004**	**4.5300e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9399**	**0.9399**	**3.0000e-005**	**0.0000**	**0.9407**

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	3.0000e-005		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6769**	**0.0000**	**0.0000**	**3.0000e-005**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	6.2000e-004	4.5000e-004	4.5300e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.9399	0.9399	3.0000e-005	0.0000	0.9407
Total	**6.2000e-004**	**4.5000e-004**	**4.5300e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9399**	**0.9399**	**3.0000e-005**	**0.0000**	**0.9407**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

Implement NEV Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3018	1.4038	2.9905	8.0800e-003	0.6205	8.6100e-003	0.6291	0.1670	8.0800e-003	0.1751	0.0000	742.0183	742.0183	0.0363	0.0000	742.9250
Unmitigated	0.3040	1.4215	3.0392	8.2700e-003	0.6363	8.7900e-003	0.6451	0.1713	8.2600e-003	0.1795	0.0000	759.3421	759.3421	0.0368	0.0000	760.2631

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		

Single Family Housing	1,003.52	1,046.08	908.32	1,714,833	1,672,134
Total	1,003.52	1,046.08	908.32	1,714,833	1,672,134

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	4.73	4.73	4.73	31.00	15.00	54.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.578299	0.039453	0.169996	0.109068	0.028307	0.006716	0.029274	0.026666	0.003071	0.001838	0.005325	0.000874	0.001112
Single Family Housing	0.578299	0.039453	0.169996	0.109068	0.028307	0.006716	0.029274	0.026666	0.003071	0.001838	0.005325	0.000874	0.001112

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

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

Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	121.9582	121.9582	0.0122	2.5200e-003	123.0150
NaturalGas Mitigated	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
NaturalGas Unmitigated	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	173.7147	173.7147	3.3300e-003	3.1800e-003	174.7470

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.25529e+006	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	173.7147	173.7147	3.3300e-003	3.1800e-003	174.7470
Total		**0.0176**	**0.1500**	**0.0638**	**9.6000e-004**		**0.0121**	**0.0121**		**0.0121**	**0.0121**	**0.0000**	**173.7147**	**173.7147**	**3.3300e-003**	**3.1800e-003**	**174.7470**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	2.6749e+006	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
Total		**0.0144**	**0.1233**	**0.0525**	**7.9000e-004**		**9.9700e-003**	**9.9700e-003**		**9.9700e-003**	**9.9700e-003**	**0.0000**	**142.7431**	**142.7431**	**2.7400e-003**	**2.6200e-003**	**143.5913**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	21000	2.7624	2.8000e-004	6.0000e-005	2.7863
Single Family Housing	906144	119.1958	0.0119	2.4700e-003	120.2287
Total		**121.9582**	**0.0122**	**2.5300e-003**	**123.0150**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1214	0.0179	0.8387	1.0000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	10.8696	10.8696	1.5100e-003	1.7000e-004	10.9592
Unmitigated	1.1214	0.0179	0.8387	1.0000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	10.8696	10.8696	1.5100e-003	1.7000e-004	10.9592

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.9273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.6000e-004	8.2100e-003	3.4900e-003	5.0000e-005		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	9.5078	9.5078	1.8000e-004	1.7000e-004	9.5643
Landscaping	0.0254	9.6400e-003	0.8352	4.0000e-005		4.6000e-003	4.6000e-003		4.6000e-003	4.6000e-003	0.0000	1.3618	1.3618	1.3300e-003	0.0000	1.3949
Total	**1.1214**	**0.0179**	**0.8386**	**9.0000e-005**		**5.2600e-003**	**5.2600e-003**		**5.2600e-003**	**5.2600e-003**	**0.0000**	**10.8695**	**10.8695**	**1.5100e-003**	**1.7000e-004**	**10.9592**

Mitigated

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

Architectural Coating	0.1677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.9273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.6000e-004	8.2100e-003	3.4900e-003	5.0000e-005		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	9.5078	9.5078	1.8000e-004	1.7000e-004	9.5643
Landscaping	0.0254	9.6400e-003	0.8352	4.0000e-005		4.6000e-003	4.6000e-003		4.6000e-003	4.6000e-003	0.0000	1.3618	1.3618	1.3300e-003	0.0000	1.3949
Total	**1.1214**	**0.0179**	**0.8386**	**9.0000e-005**		**5.2600e-003**	**5.2600e-003**		**5.2600e-003**	**5.2600e-003**	**0.0000**	**10.8695**	**10.8695**	**1.5100e-003**	**1.7000e-004**	**10.9592**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	8.2094	7.7200e-003	4.6200e-003	9.7789
Unmitigated	9.8938	9.6200e-003	5.7700e-003	11.8524

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	7.29725 / 4.60044	9.8938	9.6200e-003	5.7700e-003	11.8524
Total		**9.8938**	**9.6200e-003**	**5.7700e-003**	**11.8524**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	5.8378 / 4.31981	8.2094	7.7200e-003	4.6200e-003	9.7789
Total		**8.2094**	**7.7200e-003**	**4.6200e-003**	**9.7789**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	27.2820	1.6123	0.0000	67.5900
Unmitigated	27.2820	1.6123	0.0000	67.5900

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	134.4	27.2820	1.6123	0.0000	67.5900
Total		**27.2820**	**1.6123**	**0.0000**	**67.5900**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	134.4	27.2820	1.6123	0.0000	67.5900

Total		**27.2820**	**1.6123**	**0.0000**	**67.5900**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

18-120 Corona Station

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	188.00	Space	1.00	60,000.00	0
Single Family Housing	112.00	Dwelling Unit	5.00	236,440.00	320

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate = 290

Land Use - Applicant and Site Plan provided Land Uses

Construction Phase - Default construction schedule & Trenching

Off-road Equipment -

Off-road Equipment - Default Construction equipment & hours

Off-road Equipment - Trenching Equip Added

Trips and VMT - 1 Mile Trips

Demolition - 7,000 sqft estimate from Google Earth

Grading - Applicant provided grading import 10,000cy

Vehicle Trips - Single Family House trip rate = 8.96, 9.34, 8.11, VMT 4.73

Woodstoves - No Wood burning, All Gas

Water And Wastewater - WTP Treatment 100% Aerobic

Energy Mitigation - 20% improvement for Title 24 and efficient lighting, 100% on-site renewable energy

Water Mitigation - Install Low-Flow water utilities and irrigation

Energy Use -

Area Mitigation -

Mobile Land Use Mitigation - Implement NEV Network

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Construction Off-road Equipment Mitigation - BMPs, Tier 2 DPF 3

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	28.00	76.16
tblFireplaces	NumberWood	48.16	0.00
tblGrading	MaterialImported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	75,200.00	60,000.00

tblLandUse	LandUseSquareFeet	201,600.00	236,440.00
tblLandUse	LotAcreage	1.69	1.00
tblLandUse	LotAcreage	36.36	5.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	4.73
tblVehicleTrips	HS_TL	4.80	4.73
tblVehicleTrips	HW_TL	10.80	4.73
tblVehicleTrips	PB_TP	3.00	0.00

tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	9.91	9.34
tblVehicleTrips	SU_TR	8.62	8.11
tblVehicleTrips	WD_TR	9.52	8.96
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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					
2019	0.3539	3.3646	2.4729	4.0800e-003	0.1680	0.1821	0.3501	0.0862	0.1705	0.2567	0.0000	360.5362	360.5362	0.0894	0.0000	362.7717
2020	1.7162	0.3553	0.3375	5.4000e-004	8.6000e-004	0.0193	0.0202	2.3000e-004	0.0181	0.0183	0.0000	46.8801	46.8801	0.0123	0.0000	47.1878
Maximum	**1.7162**	**3.3646**	**2.4729**	**4.0800e-003**	**0.1680**	**0.1821**	**0.3501**	**0.0862**	**0.1705**	**0.2567**	**0.0000**	**360.5362**	**360.5362**	**0.0894**	**0.0000**	**362.7717**

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					
2019	0.1643	3.5266	2.6089	4.0800e-003	0.0800	0.0185	0.0985	0.0211	0.0184	0.0395	0.0000	360.5358	360.5358	0.0894	0.0000	362.7713
2020	1.7008	0.4640	0.3737	5.4000e-004	8.6000e-004	2.4700e-003	3.3300e-003	2.3000e-004	2.4700e-003	2.7000e-003	0.0000	46.8801	46.8801	0.0123	0.0000	47.1877
Maximum	**1.7008**	**3.5266**	**2.6089**	**4.0800e-003**	**0.0800**	**0.0185**	**0.0985**	**0.0211**	**0.0184**	**0.0395**	**0.0000**	**360.5358**	**360.5358**	**0.0894**	**0.0000**	**362.7713**

	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	**9.91**	**-7.28**	**-6.13**	**0.00**	**52.09**	**89.61**	**72.50**	**75.30**	**88.92**	**84.64**	**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	**1-1-2019**	**3-31-2019**	1.2295	1.0843
2	**4-1-2019**	**6-30-2019**	0.8227	0.8616
3	**7-1-2019**	**9-30-2019**	0.8318	0.8711
4	**10-1-2019**	**12-31-2019**	0.8307	0.8700
5	**1-1-2020**	**3-31-2020**	2.0747	2.1684
		Highest	2.0747	2.1684

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	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Trenching	Trenching	2/12/2019	2/25/2019	5	10	
5	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
6	Paving	Paving	1/28/2020	2/24/2020	5	20	

7	Architectural Coating	Architectural Coating	2/25/2020	3/23/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 1

Residential Indoor: 478,791; Residential Outdoor: 159,597; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	32.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,250.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	66.00	22.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

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					3.4500e-003	0.0000	3.4500e-003	5.2000e-004	0.0000	5.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8672

Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**3.4500e-003**	**0.0180**	**0.0214**	**5.2000e-004**	**0.0167**	**0.0172**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8672**

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	4.0000e-005	1.7000e-003	3.0000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1801	0.1801	3.0000e-005	0.0000	0.1809
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.3000e-004	1.6300e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1328	0.1328	1.0000e-005	0.0000	0.1330
Total	**3.1000e-004**	**1.8300e-003**	**1.9300e-003**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.3129**	**0.3129**	**4.0000e-005**	**0.0000**	**0.3139**

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					1.5500e-003	0.0000	1.5500e-003	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0126	0.3266	0.2467	3.9000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8671
Total	**0.0126**	**0.3266**	**0.2467**	**3.9000e-004**	**1.5500e-003**	**1.3700e-003**	**2.9200e-003**	**1.2000e-004**	**1.3700e-003**	**1.4900e-003**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8671**

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	4.0000e-005	1.7000e-003	3.0000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1801	0.1801	3.0000e-005	0.0000	0.1809
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.3000e-004	1.6300e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1328	0.1328	1.0000e-005	0.0000	0.1330
Total	**3.1000e-004**	**1.8300e-003**	**1.9300e-003**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.3129**	**0.3129**	**4.0000e-005**	**0.0000**	**0.3139**

3.3 Site Preparation - 2019

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

Unmitigated Construction Off-Site

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	8.0000e-005	9.8000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0797	0.0797	1.0000e-005	0.0000	0.0798
Total	**1.6000e-004**	**8.0000e-005**	**9.8000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0797**	**0.0797**	**1.0000e-005**	**0.0000**	**0.0798**

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					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0500e-003	0.1686	0.1148	1.9000e-004		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**6.0500e-003**	**0.1686**	**0.1148**	**1.9000e-004**	**0.0407**	**7.1000e-004**	**0.0414**	**0.0112**	**7.1000e-004**	**0.0119**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	8.0000e-005	9.8000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0797	0.0797	1.0000e-005	0.0000	0.0798

Total	**1.6000e-004**	**8.0000e-005**	**9.8000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0797**	**0.0797**	**1.0000e-005**	**0.0000**	**0.0798**

3.4 Grading - 2019

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					0.0661	0.0000	0.0661	0.0338	0.0000	0.0338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	26.6423	26.6423	8.4300e-003	0.0000	26.8530
Total	**0.0258**	**0.2835**	**0.1629**	**3.0000e-004**	**0.0661**	**0.0140**	**0.0801**	**0.0338**	**0.0129**	**0.0466**	**0.0000**	**26.6423**	**26.6423**	**8.4300e-003**	**0.0000**	**26.8530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5300e-003	0.0663	0.0118	7.0000e-005	5.3000e-004	1.3000e-004	6.6000e-004	1.5000e-004	1.2000e-004	2.7000e-004	0.0000	7.0337	7.0337	1.2400e-003	0.0000	7.0646
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.3000e-004	1.6300e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1328	0.1328	1.0000e-005	0.0000	0.1330
Total	**1.8000e-003**	**0.0664**	**0.0134**	**7.0000e-005**	**6.4000e-004**	**1.3000e-004**	**7.7000e-004**	**1.8000e-004**	**1.2000e-004**	**3.0000e-004**	**0.0000**	**7.1665**	**7.1665**	**1.2500e-003**	**0.0000**	**7.1976**

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					0.0297	0.0000	0.0297	7.6000e-003	0.0000	7.6000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.2628	0.1899	3.0000e-004		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	26.6422	26.6422	8.4300e-003	0.0000	26.8530
Total	**0.0101**	**0.2628**	**0.1899**	**3.0000e-004**	**0.0297**	**1.1600e-003**	**0.0309**	**7.6000e-003**	**1.1600e-003**	**8.7600e-003**	**0.0000**	**26.6422**	**26.6422**	**8.4300e-003**	**0.0000**	**26.8530**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5300e-003	0.0663	0.0118	7.0000e-005	5.3000e-004	1.3000e-004	6.6000e-004	1.5000e-004	1.2000e-004	2.7000e-004	0.0000	7.0337	7.0337	1.2400e-003	0.0000	7.0646
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.3000e-004	1.6300e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1328	0.1328	1.0000e-005	0.0000	0.1330
Total	**1.8000e-003**	**0.0664**	**0.0134**	**7.0000e-005**	**6.4000e-004**	**1.3000e-004**	**7.7000e-004**	**1.8000e-004**	**1.2000e-004**	**3.0000e-004**	**0.0000**	**7.1665**	**7.1665**	**1.2500e-003**	**0.0000**	**7.1976**

3.5 Trenching - 2019

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	2.4700e-003	0.0251	0.0278	4.0000e-005		1.4300e-003	1.4300e-003		1.3100e-003	1.3100e-003	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**2.4700e-003**	**0.0251**	**0.0278**	**4.0000e-005**		**1.4300e-003**	**1.4300e-003**		**1.3100e-003**	**1.3100e-003**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

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	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0221	0.0221	0.0000	0.0000	0.0222
Total	**4.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0221**	**0.0221**	**0.0000**	**0.0000**	**0.0222**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	0.0371	0.0313	4.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**1.7300e-003**	**0.0371**	**0.0313**	**4.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

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	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0221	0.0221	0.0000	0.0000	0.0222
Total	**4.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0221**	**0.0221**	**0.0000**	**0.0000**	**0.0222**

3.6 Building Construction - 2019

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	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279	0.0000	248.0349	248.0349	0.0604	0.0000	249.5455
Total	**0.2491**	**2.2238**	**1.8108**	**2.8400e-003**		**0.1361**	**0.1361**		**0.1279**	**0.1279**	**0.0000**	**248.0349**	**248.0349**	**0.0604**	**0.0000**	**249.5455**

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	5.1600e-003	0.1723	0.0482	1.7000e-004	2.1100e-003	5.0000e-004	2.6100e-003	6.2000e-004	4.8000e-004	1.1000e-003	0.0000	16.6891	16.6891	2.6200e-003	0.0000	16.7546
Worker	0.0123	5.8800e-003	0.0756	7.0000e-005	5.1200e-003	9.0000e-005	5.2100e-003	1.3700e-003	8.0000e-005	1.4500e-003	0.0000	6.1647	6.1647	4.4000e-004	0.0000	6.1757
Total	**0.0175**	**0.1781**	**0.1239**	**2.4000e-004**	**7.2300e-003**	**5.9000e-004**	**7.8200e-003**	**1.9900e-003**	**5.6000e-004**	**2.5500e-003**	**0.0000**	**22.8537**	**22.8537**	**3.0600e-003**	**0.0000**	**22.9303**

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	0.1140	2.4850	1.8857	2.8400e-003		0.0143	0.0143		0.0143	0.0143	0.0000	248.0346	248.0346	0.0604	0.0000	249.5452
Total	**0.1140**	**2.4850**	**1.8857**	**2.8400e-003**		**0.0143**	**0.0143**		**0.0143**	**0.0143**	**0.0000**	**248.0346**	**248.0346**	**0.0604**	**0.0000**	**249.5452**

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	5.1600e-003	0.1723	0.0482	1.7000e-004	2.1100e-003	5.0000e-004	2.6100e-003	6.2000e-004	4.8000e-004	1.1000e-003	0.0000	16.6891	16.6891	2.6200e-003	0.0000	16.7546
Worker	0.0123	5.8800e-003	0.0756	7.0000e-005	5.1200e-003	9.0000e-005	5.2100e-003	1.3700e-003	8.0000e-005	1.4500e-003	0.0000	6.1647	6.1647	4.4000e-004	0.0000	6.1757
Total	**0.0175**	**0.1781**	**0.1239**	**2.4000e-004**	**7.2300e-003**	**5.9000e-004**	**7.8200e-003**	**1.9900e-003**	**5.6000e-004**	**2.5500e-003**	**0.0000**	**22.8537**	**22.8537**	**3.0600e-003**	**0.0000**	**22.9303**

3.6 Building Construction - 2020

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	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003	0.0000	22.0030	22.0030	5.3700e-003	0.0000	22.1372
Total	**0.0201**	**0.1823**	**0.1601**	**2.6000e-004**		**0.0106**	**0.0106**		**9.9800e-003**	**9.9800e-003**	**0.0000**	**22.0030**	**22.0030**	**5.3700e-003**	**0.0000**	**22.1372**

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	3.8000e-004	0.0148	3.8000e-003	2.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	6.0000e-005	3.0000e-005	8.0000e-005	0.0000	1.5167	1.5167	2.1000e-004	0.0000	1.5221
Worker	1.0100e-003	4.7000e-004	6.0900e-003	1.0000e-005	4.6000e-004	1.0000e-005	4.7000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.5385	0.5385	3.0000e-005	0.0000	0.5394
Total	**1.3900e-003**	**0.0153**	**9.8900e-003**	**3.0000e-005**	**6.5000e-004**	**4.0000e-005**	**6.9000e-004**	**1.8000e-004**	**4.0000e-005**	**2.1000e-004**	**0.0000**	**2.0552**	**2.0552**	**2.4000e-004**	**0.0000**	**2.0614**

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	0.0103	0.2238	0.1698	2.6000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	22.0029	22.0029	5.3700e-003	0.0000	22.1371
Total	**0.0103**	**0.2238**	**0.1698**	**2.6000e-004**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**22.0029**	**22.0029**	**5.3700e-003**	**0.0000**	**22.1371**

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	3.8000e-004	0.0148	3.8000e-003	2.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	6.0000e-005	3.0000e-005	8.0000e-005	0.0000	1.5167	1.5167	2.1000e-004	0.0000	1.5221
Worker	1.0100e-003	4.7000e-004	6.0900e-003	1.0000e-005	4.6000e-004	1.0000e-005	4.7000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.5385	0.5385	3.0000e-005	0.0000	0.5394
Total	**1.3900e-003**	**0.0153**	**9.8900e-003**	**3.0000e-005**	**6.5000e-004**	**4.0000e-005**	**6.9000e-004**	**1.8000e-004**	**4.0000e-005**	**2.1000e-004**	**0.0000**	**2.0552**	**2.0552**	**2.4000e-004**	**0.0000**	**2.0614**

3.7 Paving - 2020

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	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1902
Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0149**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**	**0.0000**	**20.0282**	**20.0282**	**6.4800e-003**	**0.0000**	**20.1902**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.1000e-004	1.4600e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1288	0.1288	1.0000e-005	0.0000	0.1290
Total	**2.4000e-004**	**1.1000e-004**	**1.4600e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1288**	**0.1288**	**1.0000e-005**	**0.0000**	**0.1290**

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	9.3100e-003	0.2012	0.1730	2.3000e-004		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	20.0282	20.0282	6.4800e-003	0.0000	20.1901

Paving	1.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0106**	**0.2012**	**0.1730**	**2.3000e-004**		**1.0000e-003**	**1.0000e-003**		**1.0000e-003**	**1.0000e-003**	**0.0000**	**20.0282**	**20.0282**	**6.4800e-003**	**0.0000**	**20.1901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.1000e-004	1.4600e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1288	0.1288	1.0000e-005	0.0000	0.1290
Total	**2.4000e-004**	**1.1000e-004**	**1.4600e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1288**	**0.1288**	**1.0000e-005**	**0.0000**	**0.1290**

3.8 Architectural Coating - 2020

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4200e-003	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	**1.6793**	**0.0168**	**0.0183**	**3.0000e-005**		**1.1100e-003**	**1.1100e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**2.5533**	**2.5533**	**2.0000e-004**	**0.0000**	**2.5582**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.0000e-004	1.2600e-003	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1117	0.1117	1.0000e-005	0.0000	0.1118
Total	**2.1000e-004**	**1.0000e-004**	**1.2600e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1117**	**0.1117**	**1.0000e-005**	**0.0000**	**0.1118**

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1400e-003	0.0235	0.0183	3.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	**1.6781**	**0.0235**	**0.0183**	**3.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**2.0000e-004**	**0.0000**	**2.5582**

Mitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.0000e-004	1.2600e-003	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1117	0.1117	1.0000e-005	0.0000	0.1118
Total	**2.1000e-004**	**1.0000e-004**	**1.2600e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1117**	**0.1117**	**1.0000e-005**	**0.0000**	**0.1118**

18-120 Corona Station

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	188.00	Space	1.00	60,000.00	0
Single Family Housing	112.00	Dwelling Unit	5.00	236,440.00	320

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate = 290

Land Use - Applicant and Site Plan provided Land Uses

Construction Phase - Default construction schedule & Trenching

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Default Construction equipment & hours

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Trenching Equip Added

Trips and VMT - 1 Mile Trips

Demolition - 7,000 sqft estimate from Google Earth

Grading - Applicant provided grading import 10,000cy

Vehicle Trips - Single Family House trip rate = 8.96, 9.34, 8.11, VMT 4.73

Woodstoves - No Wood burning, All Gas

Energy Use -

Water And Wastewater - WTP Treatment 100% Aerobic

Construction Off-road Equipment Mitigation - BMPs, Tier 2 DPF 3

Mobile Land Use Mitigation - Implement NEV Network

Area Mitigation -

Energy Mitigation - 20% improvement for Title 24 and efficient lighting, 100% on-site renewable energy

Water Mitigation - Install Low-Flow water utilities and irrigation

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	1/23/2019	2/6/2019
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	28.00	76.16
tblFireplaces	NumberWood	48.16	0.00
tblGrading	MaterialImported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	75,200.00	60,000.00
tblLandUse	LandUseSquareFeet	201,600.00	236,440.00
tblLandUse	LotAcreage	1.69	1.00
tblLandUse	LotAcreage	36.36	5.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00

tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	4.73
tblVehicleTrips	HS_TL	4.80	4.73
tblVehicleTrips	HW_TL	10.80	4.73
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	9.91	9.34
tblVehicleTrips	SU_TR	8.62	8.11
tblVehicleTrips	WD_TR	9.52	8.96
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00

tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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					
2018	0.0650	0.6825	0.3657	6.4000e-004	0.1093	0.0346	0.1439	0.0560	0.0321	0.0880	0.0000	58.0443	58.0443	0.0166	0.0000	58.4592
2019	0.3278	3.0476	2.3906	3.8800e-003	0.0656	0.1682	0.2338	0.0312	0.1577	0.1889	0.0000	342.1800	342.1800	0.0831	0.0000	344.2586
2020	1.6841	0.0592	0.0640	1.0000e-004	1.3000e-004	3.3700e-003	3.5000e-003	3.0000e-005	3.1900e-003	3.2200e-003	0.0000	8.7120	8.7120	2.1500e-003	0.0000	8.7658
Maximum	**1.6841**	**3.0476**	**2.3906**	**3.8800e-003**	**0.1093**	**0.1682**	**0.2338**	**0.0560**	**0.1577**	**0.1889**	**0.0000**	**342.1800**	**342.1800**	**0.0831**	**0.0000**	**344.2586**

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					
2018	0.0145	0.2844	0.3569	6.4000e-004	0.0495	0.0125	0.0620	0.0127	0.0125	0.0252	0.0000	52.6677	52.6677	0.0162	0.0000	53.0722
2019	0.0830	1.5731	1.8785	3.8800e-003	0.0343	0.0806	0.1149	8.8400e-003	0.0806	0.0894	0.0000	255.5355	255.5355	0.0754	0.0000	257.4207
2020	1.6793	0.0340	0.0536	1.0000e-004	1.3000e-004	1.8300e-003	1.9600e-003	3.0000e-005	1.8300e-003	1.8600e-003	0.0000	6.1588	6.1588	1.9500e-003	0.0000	6.2076

Maximum	**1.6793**	**1.5731**	**1.8785**	**3.8800e-003**	**0.0495**	**0.0806**	**0.1149**	**0.0127**	**0.0806**	**0.0894**	**0.0000**	**255.5355**	**255.5355**	**0.0754**	**0.0000**	**257.4207**

	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	**14.45**	**50.08**	**18.84**	**0.00**	**52.07**	**53.95**	**53.09**	**75.24**	**50.83**	**58.42**	**0.00**	**23.13**	**23.13**	**8.20**	**0.00**	**23.03**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**11-15-2018**	**2-14-2019**	1.2943	0.6030
2	**2-15-2019**	**5-14-2019**	0.8041	0.3759
3	**5-15-2019**	**8-14-2019**	0.8318	0.3891
4	**8-15-2019**	**11-14-2019**	0.8313	0.3886
5	**11-15-2019**	**2-14-2020**	2.1053	1.9114
		Highest	2.1053	1.9114

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	11/15/2018	12/12/2018	5	20	
2	Site Preparation	Site Preparation	12/13/2018	12/26/2018	5	10	
3	Grading	Grading	12/27/2018	1/23/2019	5	20	
4	Trenching	Trenching	1/24/2019	2/6/2019	5	10	
5	Building Construction	Building Construction	1/24/2019	12/11/2019	5	230	
6	Paving	Paving	12/12/2019	1/8/2020	5	20	
7	Architectural Coating	Architectural Coating	1/9/2020	2/5/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 1

Residential Indoor: 478,791; Residential Outdoor: 159,597; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	32.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,250.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

Building Construction	9	66.00	22.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	13.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2018

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					3.4500e-003	0.0000	3.4500e-003	5.2000e-004	0.0000	5.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0372	0.3832	0.2230	3.9000e-004		0.0194	0.0194		0.0181	0.0181	0.0000	35.1241	35.1241	9.6800e-003	0.0000	35.3660
Total	**0.0372**	**0.3832**	**0.2230**	**3.9000e-004**	**3.4500e-003**	**0.0194**	**0.0228**	**5.2000e-004**	**0.0181**	**0.0186**	**0.0000**	**35.1241**	**35.1241**	**9.6800e-003**	**0.0000**	**35.3660**

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	4.0000e-005	1.7500e-003	3.3000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1801	0.1801	3.0000e-005	0.0000	0.1809
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**3.3000e-004**	**1.8900e-003**	**2.1500e-003**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.3167**	**0.3167**	**4.0000e-005**	**0.0000**	**0.3178**

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					1.5500e-003	0.0000	1.5500e-003	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9900e-003	0.1546	0.2082	3.9000e-004		6.6200e-003	6.6200e-003		6.6200e-003	6.6200e-003	0.0000	29.7475	29.7475	9.2600e-003	0.0000	29.9790
Total	**7.9900e-003**	**0.1546**	**0.2082**	**3.9000e-004**	**1.5500e-003**	**6.6200e-003**	**8.1700e-003**	**1.2000e-004**	**6.6200e-003**	**6.7400e-003**	**0.0000**	**29.7475**	**29.7475**	**9.2600e-003**	**0.0000**	**29.9790**

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	4.0000e-005	1.7500e-003	3.3000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1801	0.1801	3.0000e-005	0.0000	0.1809
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**3.3000e-004**	**1.8900e-003**	**2.1500e-003**	**0.0000**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.3167**	**0.3167**	**4.0000e-005**	**0.0000**	**0.3178**

3.3 Site Preparation - 2018

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3800	17.3800	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0903**	**0.0129**	**0.1032**	**0.0497**	**0.0119**	**0.0615**	**0.0000**	**17.3800**	**17.3800**	**5.4100e-003**	**0.0000**	**17.5152**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	9.0000e-005	1.0900e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0820	0.0820	1.0000e-005	0.0000	0.0822
Total	**1.8000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0820**	**0.0820**	**1.0000e-005**	**0.0000**	**0.0822**

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					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6600e-003	0.0953	0.1148	1.9000e-004		4.7300e-003	4.7300e-003		4.7300e-003	4.7300e-003	0.0000	17.3799	17.3799	5.4100e-003	0.0000	17.5152
Total	**4.6600e-003**	**0.0953**	**0.1148**	**1.9000e-004**	**0.0407**	**4.7300e-003**	**0.0454**	**0.0112**	**4.7300e-003**	**0.0159**	**0.0000**	**17.3799**	**17.3799**	**5.4100e-003**	**0.0000**	**17.5152**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	9.0000e-005	1.0900e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0820	0.0820	1.0000e-005	0.0000	0.0822
Total	**1.8000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0820**	**0.0820**	**1.0000e-005**	**0.0000**	**0.0822**

3.4 Grading - 2018

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					0.0149	0.0000	0.0149	5.6200e-003	0.0000	5.6200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1600e-003	0.0460	0.0249	4.0000e-005		2.3300e-003	2.3300e-003		2.1400e-003	2.1400e-003	0.0000	4.0660	4.0660	1.2700e-003	0.0000	4.0977
Total	**4.1600e-003**	**0.0460**	**0.0249**	**4.0000e-005**	**0.0149**	**2.3300e-003**	**0.0172**	**5.6200e-003**	**2.1400e-003**	**7.7600e-003**	**0.0000**	**4.0660**	**4.0660**	**1.2700e-003**	**0.0000**	**4.0977**

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	2.5000e-004	0.0102	1.9200e-003	1.0000e-005	4.1000e-004	2.0000e-005	4.4000e-004	1.0000e-004	2.0000e-005	1.3000e-004	0.0000	1.0551	1.0551	1.9000e-004	0.0000	1.0598
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0205	0.0205	0.0000	0.0000	0.0205
Total	**2.9000e-004**	**0.0103**	**2.1900e-003**	**1.0000e-005**	**4.3000e-004**	**2.0000e-005**	**4.6000e-004**	**1.0000e-004**	**2.0000e-005**	**1.3000e-004**	**0.0000**	**1.0756**	**1.0756**	**1.9000e-004**	**0.0000**	**1.0804**

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					6.7100e-003	0.0000	6.7100e-003	1.2700e-003	0.0000	1.2700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	0.0223	0.0285	4.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	4.0660	4.0660	1.2700e-003	0.0000	4.0977

Total	**1.0900e-003**	**0.0223**	**0.0285**	**4.0000e-005**	**6.7100e-003**	**1.1300e-003**	**7.8400e-003**	**1.2700e-003**	**1.1300e-003**	**2.4000e-003**	**0.0000**	**4.0660**	**4.0660**	**1.2700e-003**	**0.0000**	**4.0977**

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	2.5000e-004	0.0102	1.9200e-003	1.0000e-005	4.1000e-004	2.0000e-005	4.4000e-004	1.0000e-004	2.0000e-005	1.3000e-004	0.0000	1.0551	1.0551	1.9000e-004	0.0000	1.0598
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0205	0.0205	0.0000	0.0000	0.0205
Total	**2.9000e-004**	**0.0103**	**2.1900e-003**	**1.0000e-005**	**4.3000e-004**	**2.0000e-005**	**4.6000e-004**	**1.0000e-004**	**2.0000e-005**	**1.3000e-004**	**0.0000**	**1.0756**	**1.0756**	**1.9000e-004**	**0.0000**	**1.0804**

3.4 Grading - 2019

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					0.0571	0.0000	0.0571	0.0288	0.0000	0.0288	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0219	0.2410	0.1385	2.5000e-004		0.0119	0.0119		0.0109	0.0109	0.0000	22.6459	22.6459	7.1600e-003	0.0000	22.8251
Total	**0.0219**	**0.2410**	**0.1385**	**2.5000e-004**	**0.0571**	**0.0119**	**0.0689**	**0.0288**	**0.0109**	**0.0397**	**0.0000**	**22.6459**	**22.6459**	**7.1600e-003**	**0.0000**	**22.8251**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3000e-003	0.0563	0.0100	6.0000e-005	5.1000e-004	1.1000e-004	6.2000e-004	1.4000e-004	1.1000e-004	2.4000e-004	0.0000	5.9786	5.9786	1.0500e-003	0.0000	6.0049
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.1000e-004	1.3800e-003	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1129	0.1129	1.0000e-005	0.0000	0.1131
Total	**1.5300e-003**	**0.0564**	**0.0114**	**6.0000e-005**	**6.0000e-004**	**1.1000e-004**	**7.2000e-004**	**1.7000e-004**	**1.1000e-004**	**2.7000e-004**	**0.0000**	**6.0915**	**6.0915**	**1.0600e-003**	**0.0000**	**6.1180**

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					0.0257	0.0000	0.0257	6.4800e-003	0.0000	6.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1700e-003	0.1261	0.1614	2.5000e-004		6.4200e-003	6.4200e-003		6.4200e-003	6.4200e-003	0.0000	22.6459	22.6459	7.1600e-003	0.0000	22.8250
Total	**6.1700e-003**	**0.1261**	**0.1614**	**2.5000e-004**	**0.0257**	**6.4200e-003**	**0.0321**	**6.4800e-003**	**6.4200e-003**	**0.0129**	**0.0000**	**22.6459**	**22.6459**	**7.1600e-003**	**0.0000**	**22.8250**

Mitigated Construction Off-Site

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

Hauling	1.3000e-003	0.0563	0.0100	6.0000e-005	5.1000e-004	1.1000e-004	6.2000e-004	1.4000e-004	1.1000e-004	2.4000e-004	0.0000	5.9786	5.9786	1.0500e-003	0.0000	6.0049
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.1000e-004	1.3800e-003	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1129	0.1129	1.0000e-005	0.0000	0.1131
Total	**1.5300e-003**	**0.0564**	**0.0114**	**6.0000e-005**	**6.0000e-004**	**1.1000e-004**	**7.2000e-004**	**1.7000e-004**	**1.1000e-004**	**2.7000e-004**	**0.0000**	**6.0915**	**6.0915**	**1.0600e-003**	**0.0000**	**6.1180**

3.5 Trenching - 2019

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	2.4700e-003	0.0251	0.0278	4.0000e-005		1.4300e-003	1.4300e-003		1.3100e-003	1.3100e-003	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**2.4700e-003**	**0.0251**	**0.0278**	**4.0000e-005**		**1.4300e-003**	**1.4300e-003**		**1.3100e-003**	**1.3100e-003**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

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	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0221	0.0221	0.0000	0.0000	0.0222

Total	**4.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0221**	**0.0221**	**0.0000**	**0.0000**	**0.0222**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0200e-003	0.0210	0.0313	4.0000e-005		1.2000e-003	1.2000e-003		1.2000e-003	1.2000e-003	0.0000	3.7134	3.7134	1.1700e-003	0.0000	3.7428
Total	**1.0200e-003**	**0.0210**	**0.0313**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.7134**	**3.7134**	**1.1700e-003**	**0.0000**	**3.7428**

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	4.0000e-005	2.0000e-005	2.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0221	0.0221	0.0000	0.0000	0.0222
Total	**4.0000e-005**	**2.0000e-005**	**2.7000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0221**	**0.0221**	**0.0000**	**0.0000**	**0.0222**

3.6 Building Construction - 2019

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	0.2715	2.4241	1.9738	3.0900e-003		0.1483	0.1483		0.1395	0.1395	0.0000	270.3698	270.3698	0.0659	0.0000	272.0164
Total	**0.2715**	**2.4241**	**1.9738**	**3.0900e-003**		**0.1483**	**0.1483**		**0.1395**	**0.1395**	**0.0000**	**270.3698**	**270.3698**	**0.0659**	**0.0000**	**272.0164**

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	5.6200e-003	0.1878	0.0526	1.9000e-004	2.3000e-003	5.5000e-004	2.8500e-003	6.7000e-004	5.2000e-004	1.1900e-003	0.0000	18.1919	18.1919	2.8600e-003	0.0000	18.2633
Worker	0.0134	6.4100e-003	0.0824	8.0000e-005	5.5800e-003	1.0000e-004	5.6800e-003	1.4900e-003	9.0000e-005	1.5800e-003	0.0000	6.7198	6.7198	4.8000e-004	0.0000	6.7318
Total	**0.0190**	**0.1942**	**0.1350**	**2.7000e-004**	**7.8800e-003**	**6.5000e-004**	**8.5300e-003**	**2.1600e-003**	**6.1000e-004**	**2.7700e-003**	**0.0000**	**24.9116**	**24.9116**	**3.3400e-003**	**0.0000**	**24.9951**

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	0.0502	1.0962	1.4169	3.0900e-003		0.0680	0.0680		0.0680	0.0680	0.0000	183.7254	183.7254	0.0581	0.0000	185.1786
Total	**0.0502**	**1.0962**	**1.4169**	**3.0900e-003**		**0.0680**	**0.0680**		**0.0680**	**0.0680**	**0.0000**	**183.7254**	**183.7254**	**0.0581**	**0.0000**	**185.1786**

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	5.6200e-003	0.1878	0.0526	1.9000e-004	2.3000e-003	5.5000e-004	2.8500e-003	6.7000e-004	5.2000e-004	1.1900e-003	0.0000	18.1919	18.1919	2.8600e-003	0.0000	18.2633
Worker	0.0134	6.4100e-003	0.0824	8.0000e-005	5.5800e-003	1.0000e-004	5.6800e-003	1.4900e-003	9.0000e-005	1.5800e-003	0.0000	6.7198	6.7198	4.8000e-004	0.0000	6.7318
Total	**0.0190**	**0.1942**	**0.1350**	**2.7000e-004**	**7.8800e-003**	**6.5000e-004**	**8.5300e-003**	**2.1600e-003**	**6.1000e-004**	**2.7700e-003**	**0.0000**	**24.9116**	**24.9116**	**3.3400e-003**	**0.0000**	**24.9951**

3.7 Paving - 2019

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	0.0102	0.1067	0.1027	1.6000e-004		5.7700e-003	5.7700e-003		5.3100e-003	5.3100e-003	0.0000	14.3326	14.3326	4.5300e-003	0.0000	14.4460
Paving	9.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0111**	**0.1067**	**0.1027**	**1.6000e-004**		**5.7700e-003**	**5.7700e-003**		**5.3100e-003**	**5.3100e-003**	**0.0000**	**14.3326**	**14.3326**	**4.5300e-003**	**0.0000**	**14.4460**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	9.0000e-005	1.1400e-003	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0930	0.0930	1.0000e-005	0.0000	0.0931
Total	**1.9000e-004**	**9.0000e-005**	**1.1400e-003**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0930**	**0.0930**	**1.0000e-005**	**0.0000**	**0.0931**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9300e-003	0.0791	0.1211	1.6000e-004		4.2700e-003	4.2700e-003		4.2700e-003	4.2700e-003	0.0000	14.3326	14.3326	4.5300e-003	0.0000	14.4460
Paving	9.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.8500e-003**	**0.0791**	**0.1211**	**1.6000e-004**		**4.2700e-003**	**4.2700e-003**		**4.2700e-003**	**4.2700e-003**	**0.0000**	**14.3326**	**14.3326**	**4.5300e-003**	**0.0000**	**14.4460**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	9.0000e-005	1.1400e-003	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0930	0.0930	1.0000e-005	0.0000	0.0931
Total	**1.9000e-004**	**9.0000e-005**	**1.1400e-003**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0930**	**0.0930**	**1.0000e-005**	**0.0000**	**0.0931**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.0700e-003	0.0422	0.0440	7.0000e-005		2.2600e-003	2.2600e-003		2.0800e-003	2.0800e-003	0.0000	6.0085	6.0085	1.9400e-003	0.0000	6.0571
Paving	3.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.4600e-003**	**0.0422**	**0.0440**	**7.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.0800e-003**	**2.0800e-003**	**0.0000**	**6.0085**	**6.0085**	**1.9400e-003**	**0.0000**	**6.0571**

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	7.0000e-005	3.0000e-005	4.4000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0387	0.0387	0.0000	0.0000	0.0387
Total	**7.0000e-005**	**3.0000e-005**	**4.4000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0387**	**0.0387**	**0.0000**	**0.0000**	**0.0387**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6800e-003	0.0339	0.0519	7.0000e-005		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003	0.0000	6.0085	6.0085	1.9400e-003	0.0000	6.0570
Paving	3.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0700e-003**	**0.0339**	**0.0519**	**7.0000e-005**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**	**0.0000**	**6.0085**	**6.0085**	**1.9400e-003**	**0.0000**	**6.0570**

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	7.0000e-005	3.0000e-005	4.4000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0387	0.0387	0.0000	0.0000	0.0387
Total	**7.0000e-005**	**3.0000e-005**	**4.4000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0387**	**0.0387**	**0.0000**	**0.0000**	**0.0387**

3.8 Architectural Coating - 2020

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4200e-003	0.0168	0.0183	3.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	2.5533	2.5533	2.0000e-004	0.0000	2.5582
Total	**1.6793**	**0.0168**	**0.0183**	**3.0000e-005**		**1.1100e-003**	**1.1100e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**2.5533**	**2.5533**	**2.0000e-004**	**0.0000**	**2.5582**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.0000e-004	1.2600e-003	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1117	0.1117	1.0000e-005	0.0000	0.1118
Total	**2.1000e-004**	**1.0000e-004**	**1.2600e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1117**	**0.1117**	**1.0000e-005**	**0.0000**	**0.1118**

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	1.6769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	3.0000e-005		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6769**	**0.0000**	**0.0000**	**3.0000e-005**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.0000e-004	1.2600e-003	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1117	0.1117	1.0000e-005	0.0000	0.1118
Total	**2.1000e-004**	**1.0000e-004**	**1.2600e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1117**	**0.1117**	**1.0000e-005**	**0.0000**	**0.1118**

18-120 Corona Station Operational 2030 - Sonoma-San Francisco County, Annual

18-120 Corona Station Operational 2030

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	188.00	Space	1.00	60,000.00	0
Single Family Housing	112.00	Dwelling Unit	5.00	236,440.00	320

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate = 290

Land Use - Applicant and Site Plan provided Land Uses

Construction Phase - Default construction schedule & Trenching

Off-road Equipment -

Off-road Equipment - Default Construction equipment & hours

Off-road Equipment - Trenching Equip Added

Trips and VMT -

Demolition - 7,000 sqft estimate from Google Earth

Grading - Applicant provided grading import 10,000cy

Vehicle Trips - Single Family House trip rate = 8.96, 9.34, 8.11, VMT = 4.73

Woodstoves - No Wood burning, All Gas

Water And Wastewater - WTP Treatment 100% Aerobic

Mobile Land Use Mitigation - Implement NEV network

Area Mitigation -

Energy Mitigation - 20% improvement for Title 24 and efficient lighting

Water Mitigation - Install Low-Flow water utilities and irrigation

Energy Use -

Table Name	Column Name	Default Value	New Value
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	28.00	76.16
tblFireplaces	NumberWood	48.16	0.00
tblGrading	MaterialImported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	75,200.00	60,000.00
tblLandUse	LandUseSquareFeet	201,600.00	236,440.00
tblLandUse	LotAcreage	1.69	1.00
tblLandUse	LotAcreage	36.36	5.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	4.73
tblVehicleTrips	HS_TL	4.80	4.73
tblVehicleTrips	HW_TL	10.80	4.73
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	9.91	9.34
tblVehicleTrips	SU_TR	8.62	8.11
tblVehicleTrips	WD_TR	9.52	8.96
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1209	0.0178	0.8346	1.0000e-004		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	10.8695	10.8695	1.4900e-003	1.7000e-004	10.9586
Energy	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	295.6728	295.6728	0.0155	5.7100e-003	297.7620
Mobile	0.1592	0.9589	1.5550	6.4400e-003	0.6354	4.5900e-003	0.6400	0.1708	4.2800e-003	0.1751	0.0000	597.0084	597.0084	0.0226	0.0000	597.5722
Waste						0.0000	0.0000		0.0000	0.0000	27.2820	0.0000	27.2820	1.6123	0.0000	67.5900
Water						0.0000	0.0000		0.0000	0.0000	2.5818	7.3120	9.8938	9.6200e-003	5.7700e-003	11.8524
Total	**1.2977**	**1.1266**	**2.4535**	**7.5000e-003**	**0.6354**	**0.0220**	**0.6574**	**0.1708**	**0.0217**	**0.1925**	**29.8638**	**910.8628**	**940.7266**	**1.6615**	**0.0117**	**985.7351**

Mitigated Operational

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

Category	tons/yr										MT/yr					
Area	1.1209	0.0178	0.8346	1.0000e-004		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	10.8695	10.8695	1.4900e-003	1.7000e-004	10.9586
Energy	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
Mobile	0.1581	0.9509	1.5289	6.3000e-003	0.6196	4.5000e-003	0.6241	0.1666	4.1900e-003	0.1708	0.0000	583.6060	583.6060	0.0222	0.0000	584.1611
Waste						0.0000	0.0000		0.0000	0.0000	27.2820	0.0000	27.2820	1.6123	0.0000	67.5900
Water						0.0000	0.0000		0.0000	0.0000	2.0654	6.1440	8.2094	7.7200e-003	4.6200e-003	9.7789
Total	**1.2934**	**1.0919**	**2.4160**	**7.1900e-003**	**0.6196**	**0.0198**	**0.6393**	**0.1666**	**0.0194**	**0.1860**	**29.3474**	**743.3626**	**772.7100**	**1.6465**	**7.4100e-003**	**816.0799**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.33**	**3.08**	**1.53**	**4.13**	**2.49**	**10.23**	**2.75**	**2.49**	**10.37**	**3.38**	**1.73**	**18.39**	**17.86**	**0.90**	**36.39**	**17.21**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

Implement NEV Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1581	0.9509	1.5289	6.3000e-003	0.6196	4.5000e-003	0.6241	0.1666	4.1900e-003	0.1708	0.0000	583.6060	583.6060	0.0222	0.0000	584.1611

Unmitigated	0.1592	0.9589	1.5550	6.4400e-003	0.6354	4.5900e-003	0.6400	0.1708	4.2800e-003	0.1751	0.0000	597.0084	597.0084	0.0226	0.0000	597.5722

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Single Family Housing	1,003.52	1,046.08	908.32	1,714,833	1,672,134
Total	1,003.52	1,046.08	908.32	1,714,833	1,672,134

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	4.73	4.73	4.73	31.00	15.00	54.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.625329	0.031298	0.162135	0.089092	0.014618	0.004632	0.032111	0.030354	0.003196	0.001373	0.004305	0.000897	0.000662
Single Family Housing	0.625329	0.031298	0.162135	0.089092	0.014618	0.004632	0.032111	0.030354	0.003196	0.001373	0.004305	0.000897	0.000662

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	121.9582	121.9582	0.0122	2.5200e-003	123.0150
NaturalGas Mitigated	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
NaturalGas Unmitigated	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	173.7147	173.7147	3.3300e-003	3.1800e-003	174.7470

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.25529e+006	0.0176	0.1500	0.0638	9.6000e-004		0.0121	0.0121		0.0121	0.0121	0.0000	173.7147	173.7147	3.3300e-003	3.1800e-003	174.7470
Total		**0.0176**	**0.1500**	**0.0638**	**9.6000e-004**		**0.0121**	**0.0121**		**0.0121**	**0.0121**	**0.0000**	**173.7147**	**173.7147**	**3.3300e-003**	**3.1800e-003**	**174.7470**

Mitigated

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

Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	2.6749e+006	0.0144	0.1233	0.0525	7.9000e-004		9.9700e-003	9.9700e-003		9.9700e-003	9.9700e-003	0.0000	142.7431	142.7431	2.7400e-003	2.6200e-003	143.5913
Total		**0.0144**	**0.1233**	**0.0525**	**7.9000e-004**		**9.9700e-003**	**9.9700e-003**		**9.9700e-003**	**9.9700e-003**	**0.0000**	**142.7431**	**142.7431**	**2.7400e-003**	**2.6200e-003**	**143.5913**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	21000	2.7624	2.8000e-004	6.0000e-005	2.7863
Single Family Housing	906144	119.1958	0.0119	2.4700e-003	120.2287
Total		**121.9582**	**0.0122**	**2.5300e-003**	**123.0150**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1209	0.0178	0.8346	1.0000e-004		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	10.8695	10.8695	1.4900e-003	1.7000e-004	10.9586
Unmitigated	1.1209	0.0178	0.8346	1.0000e-004		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	10.8695	10.8695	1.4900e-003	1.7000e-004	10.9586

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.9273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.6000e-004	8.2100e-003	3.4900e-003	5.0000e-005		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	9.5078	9.5078	1.8000e-004	1.7000e-004	9.5643
Landscaping	0.0250	9.5800e-003	0.8311	4.0000e-005		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	1.3618	1.3618	1.3000e-003	0.0000	1.3944
Total	**1.1209**	**0.0178**	**0.8346**	**9.0000e-005**		**5.2800e-003**	**5.2800e-003**		**5.2800e-003**	**5.2800e-003**	**0.0000**	**10.8695**	**10.8695**	**1.4800e-003**	**1.7000e-004**	**10.9586**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.9273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.6000e-004	8.2100e-003	3.4900e-003	5.0000e-005		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	9.5078	9.5078	1.8000e-004	1.7000e-004	9.5643
Landscaping	0.0250	9.5800e-003	0.8311	4.0000e-005		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	1.3618	1.3618	1.3000e-003	0.0000	1.3944
Total	**1.1209**	**0.0178**	**0.8346**	**9.0000e-005**		**5.2800e-003**	**5.2800e-003**		**5.2800e-003**	**5.2800e-003**	**0.0000**	**10.8695**	**10.8695**	**1.4800e-003**	**1.7000e-004**	**10.9586**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	8.2094	7.7200e-003	4.6200e-003	9.7789

Unmitigated	9.8938	9.6200e-003	5.7700e-003	11.8524

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	7.29725 / 4.60044	9.8938	9.6200e-003	5.7700e-003	11.8524
Total		**9.8938**	**9.6200e-003**	**5.7700e-003**	**11.8524**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	5.8378 / 4.31981	8.2094	7.7200e-003	4.6200e-003	9.7789
Total		**8.2094**	**7.7200e-003**	**4.6200e-003**	**9.7789**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	27.2820	1.6123	0.0000	67.5900
Unmitigated	27.2820	1.6123	0.0000	67.5900

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	134.4	27.2820	1.6123	0.0000	67.5900
Total		**27.2820**	**1.6123**	**0.0000**	**67.5900**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	134.4	27.2820	1.6123	0.0000	67.5900
Total		**27.2820**	**1.6123**	**0.0000**	**67.5900**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

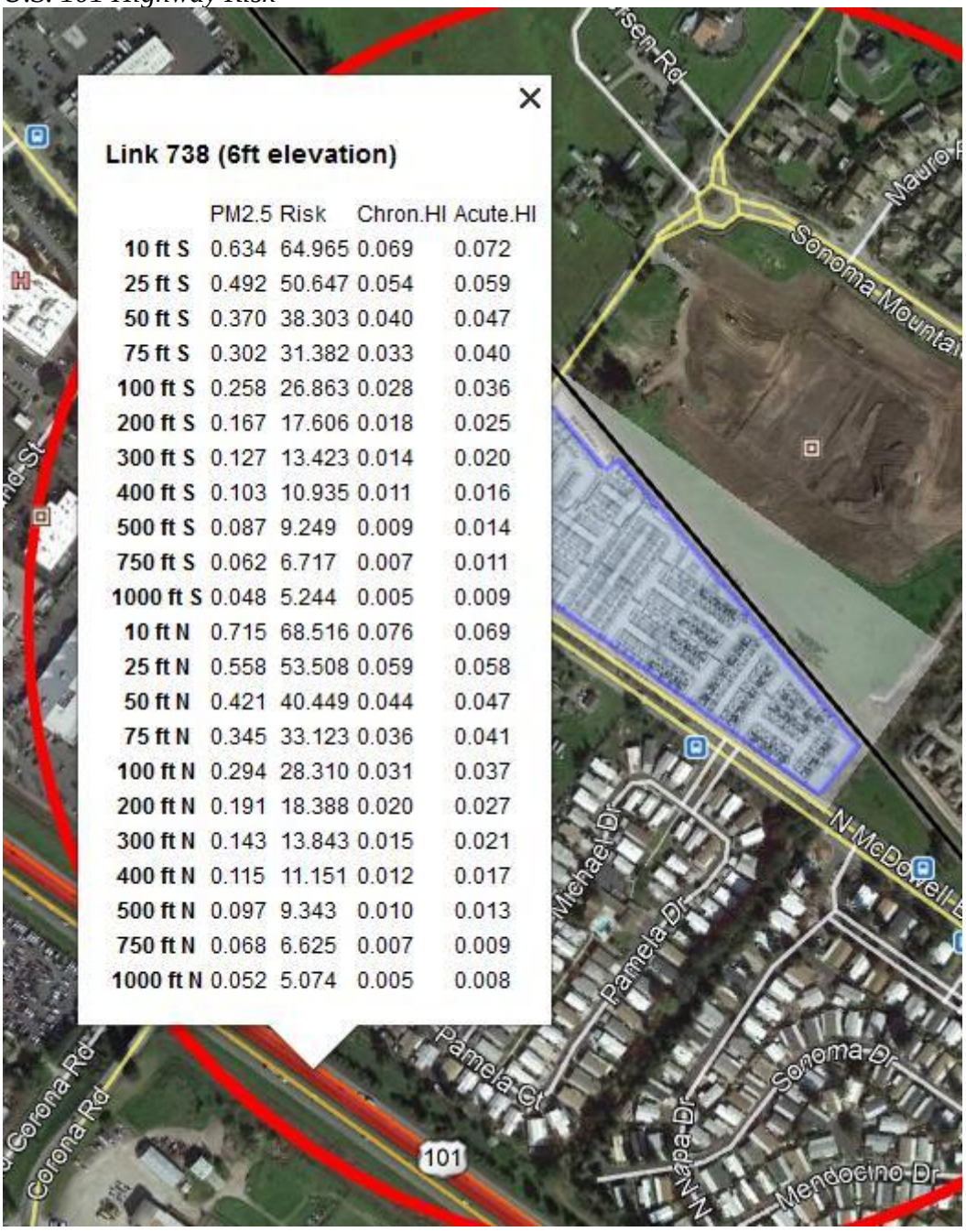
User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: Screening Community Risk Calculations

U.S. 101 Highway Risk



Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Sonoma
Roadway Direction	North-South
Side of the Roadway	East
Distance from Roadway	25 feet
	Project Site
Annual Average Daily Traffic (ADT)	19,758

Results

Sonoma County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.368 ($\mu g/m^3$)

Cancer Risk

14.27 (per million)

N. McDowell Blvd

Cumulative plus project volumes from traffic report
Data for Sonoma County based on meteorological data collected from Santa Rosa in 2005

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

9.81
(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

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• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Sonoma
Roadway Direction	East-West
Side of the Roadway	South
Distance from Roadway	150 feet
	Project Site
Annual Average Daily Traffic (ADT)	13,164

Results

Sonoma County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.055 ($\mu g/m^3$)

Cancer Risk

2.29 (per million)

Corona Road

Cumulative plus project volumes from traffic report
Data for Sonoma County based on meteorological data collected from Santa Rosa in 2005

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

1.57

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

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• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Sonoma
Roadway Direction	North-South
Side of the Roadway	East
Distance from Roadway	450 feet
	Const MEI
Annual Average Daily Traffic (ADT)	19,758

Results

Sonoma County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.064 ($\mu g/m^3$)

Cancer Risk

2.62 (per million)

N. McDowell Blvd

Cumulative plus project volumes from traffic report
Data for Sonoma County based on meteorological data collected from Santa Rosa in 2005

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

1.80
(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Sonoma
Roadway Direction	East-West
Side of the Roadway	South
Distance from Roadway	600 feet
	Const MEI
Annual Average Daily Traffic (ADT)	13,164

Results

Sonoma County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.019 ($\mu g/m^3$)

Cancer Risk

0.81 (per million)

Corona Road

Cumulative plus project volumes from traffic report
Data for Sonoma County based on meteorological data collected from Santa Rosa in 2005

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

0.56

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

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

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

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

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

Table A: Requester Contact Information

Date of Request	**9/7/2018**
Contact Name	Mimi McNamara
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x35
Email	mmcnamara@illingworthrodkin.com
Project Name	Corona Station
Address	137-061-019
City	Petaluma, CA 94954
County	Sonoma
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	112 units

Comments: Plant # 17944 is from the 2012 stationary source tool. Is this still an active source?

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

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

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

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

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

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

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

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

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

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

Table B: Google Earth data

Distance from Receptor (feet) or MEI[1]	Facility Name	Address	Plant No.	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
											PROJECT SITE			
480	Autodesk Inc	1031 N McDowell Blvd	18832	1.0325668	0.0017	0.00131	S1	Generator	98	Use IC Engine Multiplier	0.14	0.14	0.00	0.00
750	PG&E Petaluma Service Center	210 Corona Rd	106677	7.0628125	0.0349	NA	S1	Gas Dispensing Facility		Use GDF Multiplier	0.02	0.16	0.00	#VALUE!

Footnotes:

1. Maximally exposed individual
2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

Date last updated:

Construction MEI

Distance from Receptor (feet) or MEI[1]	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
1000	0.04	0.04	0.00	0.00
1000	0.01	0.11	0.00	#VALUE!

Memorandum

Date: October 9, 2018

Project: PET213

To: Mr. Todd Kurtin
Lomas-Corona Station, LLC
13848 Weddington Street
Sherman Oaks, CA 91401

From: Allison Jaromin
ajaromin@w-trans.com

Subject: Corona Station Trip Generation

Trip Generation

Table 1 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Single Family	112 du	9.44	1,057	0.74	83	21	62	0.99	111	70	41
Transit Deduction		*-5%*	*-53*	*-5%*	*-4*	*-1*	*-3*	*-5%*	*-6*	*-4*	*-2*
Total			**1,004**		**79**	**20**	**59**		**105**	**66**	**39**

Note: du = dwelling unit

Attachment 4: N. McDowell Refined Health Impact Evaluation Emissions and Health Risk Calculations

Corona Station, Petaluma, CA
N. McDowell Blvd
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-N McDowell	Northbound N. McDowell	N	2	979	44	13.3	3.4	270	35
SB-N McDowell	Southboudn N. McDowell	S	2	979	44	13.3	3.4	270	35

2021 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.97%	8	0.0185	9	4.55%	12	0.0174	17	3.87%	10	0.0164
2	2.36%	6	0.0208	10	5.45%	15	0.0170	18	35.08%	95	0.0168
3	2.49%	7	0.0227	11	4.17%	11	0.0173	19	1.75%	5	0.0200
4	1.40%	4	0.0166	12	4.78%	13	0.0171	20	0.65%	2	0.0192
5	1.18%	3	0.0198	13	4.20%	11	0.0168	21	2.06%	6	0.0185
6	1.52%	4	0.0150	14	3.96%	11	0.0169	22	2.99%	8	0.0167
7	3.33%	9	0.0152	15	3.52%	10	0.0166	23	2.15%	6	0.0183
8	2.35%	6	0.0164	16	2.71%	7	0.0171	24	0.50%	1	0.0200
								Total		270	

2021 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.97%	8	0.0185	9	4.55%	12	0.0174	17	3.87%	10	0.0164
2	2.36%	6	0.0208	10	5.45%	15	0.0170	18	35.08%	95	0.0168
3	2.49%	7	0.0227	11	4.17%	11	0.0173	19	1.75%	5	0.0200
4	1.40%	4	0.0166	12	4.78%	13	0.0171	20	0.65%	2	0.0192
5	1.18%	3	0.0198	13	4.20%	11	0.0168	21	2.06%	6	0.0185
6	1.52%	4	0.0150	14	3.96%	11	0.0169	22	2.99%	8	0.0167
7	3.33%	9	0.0152	15	3.52%	10	0.0166	23	2.15%	6	0.0183
8	2.35%	6	0.0164	16	2.71%	7	0.0171	24	0.50%	1	0.0200
								Total		270	

Corona Station, Petaluma, CA
N. McDowell Blvd
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2021

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N McDowell	Northbound N. McDowell	N	2	979	44	13.3	1.3	9,879	35
SB-N McDowell	Southboudn N. McDowell	S	2	979	44	13.3	1.3	9,879	35

2021 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.11%	109	0.0218	9	7.10%	701	0.0206	17	7.41%	732	0.0203
2	0.38%	37	0.0230	10	4.31%	426	0.0213	18	8.28%	818	0.0201
3	0.33%	33	0.0225	11	4.62%	456	0.0207	19	5.78%	571	0.0199
4	0.18%	18	0.0276	12	5.86%	578	0.0207	20	4.35%	430	0.0199
5	0.45%	45	0.0214	13	6.16%	609	0.0204	21	3.27%	323	0.0201
6	0.84%	82	0.0228	14	6.04%	597	0.0205	22	3.30%	326	0.0205
7	3.75%	370	0.0207	15	7.07%	698	0.0203	23	2.48%	245	0.0203
8	7.85%	775	0.0199	16	7.21%	712	0.0201	24	1.89%	187	0.0198
								Total		9,879	

2021 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.11%	109	0.0218	9	7.10%	701	0.0206	17	7.41%	732	0.0203
2	0.38%	37	0.0230	10	4.31%	426	0.0213	18	8.28%	818	0.0201
3	0.33%	33	0.0225	11	4.62%	456	0.0207	19	5.78%	571	0.0199
4	0.18%	18	0.0276	12	5.86%	578	0.0207	20	4.35%	430	0.0199
5	0.45%	45	0.0214	13	6.16%	609	0.0204	21	3.27%	323	0.0201
6	0.84%	82	0.0228	14	6.04%	597	0.0205	22	3.30%	326	0.0205
7	3.75%	370	0.0207	15	7.07%	698	0.0203	23	2.48%	245	0.0203
8	7.85%	775	0.0199	16	7.21%	712	0.0201	24	1.89%	187	0.0198
								Total		9,879	

Corona Station, Petaluma, CA
N. McDowell Blvd
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2021

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-N McDowell	Northbound N. McDowell	N	2	979	44	13.3	1.3	9,879	35
SB-N McDowell	Southboudn N. McDowell	S	2	979	44	13.3	1.3	9,879	35

2021 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.11%	109	0.0152	9	7.10%	701	0.0152	17	7.41%	732	0.0152
2	0.38%	37	0.0152	10	4.31%	426	0.0152	18	8.28%	818	0.0152
3	0.33%	33	0.0152	11	4.62%	456	0.0152	19	5.78%	571	0.0152
4	0.18%	18	0.0152	12	5.86%	578	0.0152	20	4.35%	430	0.0152
5	0.45%	45	0.0152	13	6.16%	609	0.0152	21	3.27%	323	0.0152
6	0.84%	82	0.0152	14	6.04%	597	0.0152	22	3.30%	326	0.0152
7	3.75%	370	0.0152	15	7.07%	698	0.0152	23	2.48%	245	0.0152
8	7.85%	775	0.0152	16	7.21%	712	0.0152	24	1.89%	187	0.0152
								Total		9,879	

2021 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-N McDowell

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.11%	109	0.0152	9	7.10%	701	0.0152	17	7.41%	732	0.0152
2	0.38%	37	0.0152	10	4.31%	426	0.0152	18	8.28%	818	0.0152
3	0.33%	33	0.0152	11	4.62%	456	0.0152	19	5.78%	571	0.0152
4	0.18%	18	0.0152	12	5.86%	578	0.0152	20	4.35%	430	0.0152
5	0.45%	45	0.0152	13	6.16%	609	0.0152	21	3.27%	323	0.0152
6	0.84%	82	0.0152	14	6.04%	597	0.0152	22	3.30%	326	0.0152
7	3.75%	370	0.0152	15	7.07%	698	0.0152	23	2.48%	245	0.0152
8	7.85%	775	0.0152	16	7.21%	712	0.0152	24	1.89%	187	0.0152
								Total		9,879	

Corona Station, Petaluma, CA
N. McDowell Blvd Traffic Data and PM2.5 & TOG Emission Factors - 35 mph

Analysis Year = ***2021***

Vehicle Type	2021 Caltrans Number Vehicles (veh/day)	2021 Number Vehicles (veh/day)	2021 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	13,749	13,749	1.28%	176	35	0.0166	0.0195	0.0017	0.0181	0.042
LDT	5,155	5,155	0.17%	9	35	0.0224	0.0195	0.0017	0.0308	0.124
MDT	569	569	16.04%	91	35	0.0245	0.0259	0.0036	0.0602	0.333
HDT	285	285	92.88%	264	35	0.0150	0.0707	0.0142	0.2125	0.248
Total	19,758	19,758	-	541	35	-	-		-	-
Mix Avg Emission Factor						**0.01727**	**0.02041**	**0.00197**	**0.02272**	**0.07186**
Increase From 2021		1.00								
Vehicles/Direction		9,879		270						
Avg Vehicles/Hour/Direction		**412**		**11**						

Traffic Data Year = ***2021***

	Total	Total Truck	Truck by Axle 2	3	4	5
Almaden Expressway	19,758	854	569	95	95	95
			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		4.32%	2.88%	0.48%	0.48%	0.48%

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

Corona Station, Petaluma, CA
N. McDowell Blvd Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5}$ = $PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10} \times (0.0686/0.4572) = 1.0 \times 0.15 = 0.15$ g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)
Major	0.032	2.4	Sonoma	69	0.01523

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Corona Station, Petaluma, CA - N. McDowell - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Residential Receptors (1.5 meter receptor heights)

Emissions Year	2021
Receptor Information	
Number of Receptors	171
Receptor Height =	1.5 meters above ground level
Receptor distances =	10 meter grid in residential area
Meteorological Conditions	
Petaluma	2013-2017
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological Data Years	Concentration (µg/m^3)		
	DPM	Exhaust TOG	Evaporative TOG
2009-2013	0.00282	0.1302	0.4128

Meteorological Data Years	PM2.5 Concentrations (µg/m^3)		
	Total PM2.5	Road Dust PM2.5	Vehicle PM2.5
2009-2013	0.2335	0.1162	0.1173

Corona Station, Petaluma, CA - N. McDowell Traffic Maximum Cancer Risks
On-Site Residential Receptors (1.5 meter receptor heights)
30-Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Values

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

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

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual TAC Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	Total
0	2021	0.25	-0.25 - 0*	10	0.0028	0.1302	0.4128	0.038	0.010	0.002	0.05
1	2021	1	1	10	0.0028	0.1302	0.4128	0.46	0.122	0.023	0.61
2	2022	1	2	10	0.0028	0.1302	0.4128	0.46	0.122	0.023	0.61
3	2023	1	3	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
4	2024	1	4	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
5	2025	1	5	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
6	2026	1	6	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
7	2027	1	7	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
8	2028	1	8	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
9	2029	1	9	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
10	2030	1	10	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
11	2031	1	11	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
12	2032	1	12	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
13	2033	1	13	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
14	2034	1	14	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
15	2035	1	15	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
16	2036	1	16	3	0.0028	0.1302	0.4128	0.07	0.019	0.004	0.10
17	2037	1	17	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
18	2038	1	18	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
19	2039	1	19	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
20	2040	1	20	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
21	2041	1	21	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
22	2042	1	22	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
23	2043	1	23	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
24	2044	1	24	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
25	2045	1	25	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
26	2046	1	26	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
27	2047	1	27	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
28	2048	1	28	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
29	2049	1	29	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
30	2050	1	30	1	0.0028	0.1302	0.4128	0.01	0.002	0.000	0.011
Total Increased Cancer Risk			**Total**					2.10	0.553	0.103	**2.76**

* Third trimester of pregnancy

Corona Station, Petaluma, CA - N. McDowell - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Residential Receptors (4.5 meter receptor heights)

Emissions Year	2021
Receptor Information	
Number of Receptors	171
Receptor Height =	4.5 meters above ground level
Receptor distances =	10 meter grid in residential area
Meteorological Conditions	
Petaluma	2013-2017
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological Data Years	Concentration (µg/m^3)		
	DPM	Exhaust TOG	Evaporative TOG
2009-2013	0.00269	0.1219	0.3866

Meteorological Data Years	PM2.5 Concentrations (µg/m^3)		
	Total PM2.5	Road Dust PM2.5	Vehicle PM2.5
2009-2013	0.2157	0.1059	0.1098

Corona Station, Petaluma, CA - N. McDowell Traffic Maximum Cancer Risks
On-Site Residential Receptors (4.5 meter receptor heights)
30-Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Values

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

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

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual TAC Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	Total
0	2021	0.25	-0.25 - 0*	10	0.0027	0.1219	0.3866	0.037	0.009	0.002	0.05
1	2021	1	1	10	0.0027	0.1219	0.3866	0.44	0.114	0.021	0.58
2	2022	1	2	10	0.0027	0.1219	0.3866	0.44	0.114	0.021	0.58
3	2023	1	3	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
4	2024	1	4	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
5	2025	1	5	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
6	2026	1	6	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
7	2027	1	7	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
8	2028	1	8	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
9	2029	1	9	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
10	2030	1	10	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
11	2031	1	11	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
12	2032	1	12	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
13	2033	1	13	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
14	2034	1	14	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
15	2035	1	15	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
16	2036	1	16	3	0.0027	0.1219	0.3866	0.07	0.018	0.003	0.09
17	2037	1	17	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
18	2038	1	18	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
19	2039	1	19	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
20	2040	1	20	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
21	2041	1	21	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
22	2042	1	22	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
23	2043	1	23	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
24	2044	1	24	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
25	2045	1	25	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
26	2046	1	26	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
27	2047	1	27	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
28	2048	1	28	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
29	2049	1	29	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
30	2050	1	30	1	0.0027	0.1219	0.3866	0.01	0.002	0.000	0.010
Total Increased Cancer Risk			**Total**					2.00	0.518	0.097	**2.62**

* Third trimester of pregnancy

Attachment 5: Construction Health Risk Calculations

Corona Station, Petaluma, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2019-2020	Construction	0.2014	CON_DPM	402.8	0.12262	1.54E-02	29033.93	5.32E-07

Construction Hours

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

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2019-2020	Construction	CON_FUG	0.08643	172.9	0.05262	6.63E-03	29,034	2.28E-07

Construction Hours

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

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2019-2020	Construction	0.0210	CON_DPM	41.9	0.01277	1.61E-03	29033.93	5.54E-08

Construction Hours

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

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2019-2020	Construction	CON_FUG	0.02133	42.7	0.01299	1.64E-03	29,034	5.64E-08

Construction Hours

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

Corona Station, Petaluma, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Unmitigated

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2019-2020	0.1091	0.0507	**17.9**	**0.3**	**0.022**	**0.16**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2019-2020	0.0114	0.0125	**1.9**	**0.0**	**0.002**	**0.02**

Corona Station, Petaluma, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

	Infant/Child				Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 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				Adult - Exposure Information				Maximum	
						Infant/Child		Modeled		Adult		
Exposure	Exposure Duration		DPM Conc (ug/m3)		Age Sensitivity	Cancer Risk	DPM Conc (ug/m3)		Age Sensitivity	Cancer 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*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2019	0.1091	10	17.92	2019	0.1091	1	0.31	0.0507	0.1598
2	1	1 - 2	2020	0.0000	10	0.00	2020	0.0000	1	0.00		
3	1	2 - 3	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
4	1	3 - 4	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
5	1	4 - 5	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
6	1	5 - 6	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
7	1	6 - 7	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
8	1	7 - 8	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
9	1	8 - 9	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
10	1	9 - 10	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
11	1	10 - 11	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
12	1	11 - 12	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
13	1	12 - 13	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
14	1	13 - 14	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
15	1	14 - 15	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
16	1	15 - 16	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
17	1	16-17	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
18	1	17-18	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
19	1	18-19	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
20	1	19-20	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
21	1	20-21	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
22	1	21-22	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
23	1	22-23	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
24	1	23-24	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
25	1	24-25	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
26	1	25-26	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
27	1	26-27	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
28	1	27-28	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
29	1	28-29	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
30	1	29-30	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
Total Increased Cancer Risk						**17.9**				**0.31**		

* Third trimester of pregnancy

Corona Station, Petaluma, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

	Infant/Child				Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 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				Adult - Exposure Information				Maximum	
							Modeled					
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2019	0.0114	10	1.87	2019	0.0114	1	0.03	0.0125	0.0239
2	1	1 - 2	2020	0.0000	10	0.00	2020	0.0000	1	0.00		
3	1	2 - 3	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
4	1	3 - 4	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
5	1	4 - 5	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
6	1	5 - 6	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
7	1	6 - 7	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
8	1	7 - 8	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
9	1	8 - 9	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
10	1	9 - 10	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
11	1	10 - 11	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
12	1	11 - 12	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
13	1	12 - 13	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
14	1	13 - 14	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
15	1	14 - 15	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
16	1	15 - 16	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
17	1	16-17	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
18	1	17-18	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
19	1	18-19	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
20	1	19-20	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
21	1	20-21	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
22	1	21-22	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
23	1	22-23	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
24	1	23-24	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
25	1	24-25	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
26	1	25-26	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
27	1	26-27	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
28	1	27-28	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
29	1	28-29	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
30	1	29-30	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
Total Increased Cancer Risk						**1.9**				**0.03**		

* Third trimester of pregnancy