APPENDIX C

Air Quality and Greenhouse Gas Technical Assessment

Project Description

The proposed project would develop the 22.27-acre project site, at 3233 Deer Hill Road in east central Lafayette, with a 315-unit apartment complex that would include 14 residential buildings of 2- and 3-stories, a 2-story clubhouse with recreational amenities for residents, and a 1- story leasing office, as well as 567 parking spaces provided in carports and garages and on internal roadways. Pedestrian facilities including stairs and walkways would connect the proposed buildings and amenities within the project site.

The proposed project would also widen the Pleasant Hill Road to add a third lane for southbound traffic between Deer Hill Road and State Route-24.[1] Along the project frontage on Pleasant Hill Road, the proposed project would add school bus stops and a Class I shared path for bicycles and pedestrians. Existing passengers loading spaces would be relocated to this location. In addition, the proposed project would extend the existing northbound left-turn lane to Acalanes Avenue.

Existing Conditions

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). Note that Reactive Organic Gases (ROGs), which are also known as reactive organic compounds (ROCs) or volatile organic compounds (VOCs), and nitrogen oxide (NOx) are not classified as criteria pollutants. However, ROGs and NOx are widely emitted from land development projects and participate in photochemical reactions in the atmosphere to form O_3; therefore, NOx and ROGs are relevant to the proposed project and are of concern in the air basin and are listed below along with the criteria pollutants.

- **Ozone (O_3).** O_3 is a gas that is formed when NO_X and ROGs, both byproducts of internal combustion engine exhaust and other sources, undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when the combination of direct

1 A project variant without this third lane is also being considered. The inclusion or exclusion of the third lane would not affect the amounts of air pollutant or greenhouse gas emissions resulting from the project. Therefore, this technical assessment addresses and is applicable to both the proposed project and the project variant.

sunlight, light wind, and warm temperature conditions create conditions favorable to the formation of this pollutant.

- **Reactive Organic Gases (ROGs).** ROGs are compounds composed primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of these hydrocarbons. Adverse effects on human health are not caused directly by ROGs, but rather by reactions of ROGs to form secondary air pollutants, including ozone.

- **Nitrogen Dioxide (NO_2) and Nitrogen Oxides (NOx).** Fuel combustion produces nitrogen which combines with oxygen to produce nitric oxide (NO). Further oxidation of NO results in the formation of NO_2, which is a criteria pollutant. NO_2 is a reddish-brown, highly reactive gas which acts as an acute irritant and, in equal concentrations, is more injurious than NO. NO and NO_2 are referred to together as oxides of nitrogen (NOx). As noted above, NOx is involved in photochemical reactions that produce ozone.

- **Carbon Monoxide (CO).** CO is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during winter mornings, with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines and motor vehicles operating at slow speeds, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.

- **Sulfur dioxide (SO_2).** SO_2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high-sulfur-content fuel oils and coal and from chemical processes occurring at chemical plants and refineries. When sulfur dioxide oxidizes in the atmosphere, it forms sulfates (SO_4).

- **Respirable Particulate Matter (PM_{10}).** PM_{10} consists of extremely small, suspended particles or droplets 10 micrometers or smaller in diameter. Some sources of PM_{10}, like pollen and windstorms, are naturally occurring. However, in populated areas, most PM_{10} is caused by road dust, diesel soot, and combustion products, abrasion of tires and brakes, and construction activities.

- **Fine Particulate Matter ($PM_{2.5}$).** $PM_{2.5}$ refers to particulate matter that is 2.5 micrometers or smaller in size. The sources of $PM_{2.5}$ include fuel combustion from automobiles, power plants, wood burning, industrial processes, and diesel-powered vehicles such as buses and trucks. These fine particles are also formed in the atmosphere when gases such as sulfur dioxide, NO_X, and VOCs are transformed in the air by chemical reactions.

- **Lead (Pb).** Pb occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Basin. The use of leaded gasoline is no longer permitted for on-road motor vehicles, so most such combustion emissions are associated with off-road vehicles such as racecars that use leaded gasoline. Other sources of Pb include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for setting the National Ambient Air Quality Standards (NAAQS). The air quality of a region is considered to be in attainment of the

NAAQS if the measured ambient criteria pollutant levels are not exceeded more than once per year, except for O_3, PM_{10}, and $PM_{2.5}$. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Air Resources Board (CARB) is the state agency responsible for setting the California Ambient Air Quality Standards (CAAQS). The air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead are not exceeded, and other standards are not equaled or exceeded at any time in any consecutive three-year period. The NAAQS and CAAQS for each of the monitored pollutants and their effects on health are summarized in **Table 1, Ambient Air Quality Standards**.

Table 1
Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
Ozone (O_3)	8-hour	0.070 ppm (137 $\mu g/m^3$)	0.070 ppm (137 $\mu g/m^3$)	Same as primary	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage
	1-hour	0.09 ppm (180 $\mu g/m^3$)	--[5]	--	
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	--	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	--	
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Same as primary	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
	1-hour	0.18 ppm (339 $\mu g/m^3$)	0.100 ppm[6] (188 $\mu g/m^3$)	--	
Sulfur Dioxide (SO_2)	Annual	--	--[7]	0.030 ppm (80 $\mu g/m^3$)	
	24-hour	0.04 ppm (105 $\mu g/m^3$)	--[7]	--	
	3-hour	--	--	0.5 ppm (1300 $\mu g/m^3$)	

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
	1-hour	0.25 ppm (655 μg/m³)	0.075 ppm[7] (196 μg/m³)	--	Bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Respirable Particulate Matter (PM_{10})	Annual	20 μg/m³	--	--	a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
	24-hour	50 μg/m³	150 μg/m³	Same as primary	
Fine Particulate Matter ($PM_{2.5}$)	24-hour	No separate state standard	35 μg/m³	--	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
	Annual	12 μg/m³	12 μg/m³	--	
Lead	Calendar Quarter	--	1.5 μg/m³	Same as primary	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
	30-day Average	1.5 μg/m3	--	--	

Source: CARB, Ambient Air Quality Standards, accessed October 15, 2019 (https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm)

ppm = parts per million by volume; μg/m³ = microgram per cubic meter; mg/m³ = milligrams per cubic meter.

1 *Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.*

2 *Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.*

3 *Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the U.S. Environmental Protection Agency (US EPA).*

4 *Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*

5 *The national 1-hour ozone standard was revoked by US EPA on June 15, 2005. A new 8-hour standard was established in May 2008.*

6 *The form of the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the daily maximum 1-hour average concentration.*

7 *On June 2, 2010 the US EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of the 1-hour daily maximum. The US EPA also revoked both the existing 24-hour and annual average SO_2 standards.*

Table 2, Attainment Status of the San Francisco Bay Area Air Basin (SFBAAB) below presents the current attainment status of the SFBAAB with respect to State and federal air quality standards.

Table 2
Attainment Status of the San Francisco Bay Area Air Basin (SFBAAB)

Pollutant	State	Federal
Ozone (O_3)	Non-Attainment	Non-attainment
Particulate Matter (PM_{10})	Non-Attainment	Unclassified
Particulate Matter ($PM_{2.5}$)	Non-Attainment	Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment

Source: BAAQMD. 2017. Air Quality Standards and Attainment Status. Available online at: http://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status#ten, accessed October 15, 2019.

Significance Criteria

The federal and state governments have established ambient air quality standards for outdoor concentrations of criteria pollutants. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. The Bay Area Air Quality Management District (BAAQMD) is responsible for maintaining air quality in the SFBAAB within federal and state air quality standards. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the SFBAAB and developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards. Based on the results of monitoring and inventories of existing and projected air pollutant emissions prepared for the air basin as part of its planning process, the BAAQMD has developed numeric thresholds for annual mass emissions and average daily emissions. The lead agency may use the thresholds to evaluate whether the emissions that would be added to the air basin by a proposed project would be substantial enough to result in an exceedance of an air quality standard or would contribute substantially to an existing air quality exceedance, and would therefore have the potential to result in adverse health effects. If a project would result in emissions below the numeric thresholds provided by the BAAQMD, the project would not contribute substantially to an existing exceedance or cause an exceedance, and hence would not have the potential to result in adverse health effects. The numeric thresholds for air quality impact evaluation from the BAAQMD *CEQA Air Quality Guidelines* are presented below (BAAQMD 2017).

Construction Emission Thresholds. Construction emissions associated with the proposed project would be considered significant if they would exceed the thresholds listed in **Table 3, Construction Emission Thresholds**.

Table 3
Construction Emission Thresholds

Criteria Air Pollutants	Average Daily Emissions (pounds per day)
NO_X	54
ROG	54
PM10*	82
PM2.5*	54

**Applies to exhaust emissions only.*
Source: BAAQMD. 2017. CEQA Air Quality Guidelines. Available online at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, accessed October 15, 2019.

Operation Emissions Thresholds. Impacts from direct and/or indirect operational emissions associated with the proposed project would be considered significant if they would exceed the daily or annual emissions thresholds shown in **Table 4, Operational Emission Thresholds,** below.

Table 4
Operational Emission Thresholds

Criteria Air Pollutants	Maximum Annual Emissions (tons per year)	Average Daily Emissions (pounds per day)
NOx	10	54
ROG	10	54
PM10	15	82
PM2.5	10	54

Source: BAAQMD. 2017. CEQA Air Quality Guidelines. Available online at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, accessed October 15, 2019.

Methodology

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to predict emissions from the construction and operation of the proposed project. Average daily emissions from project construction and operation were calculated, including both on-site and off-site activities.

Construction Impacts

The proposed project would include the construction of a 315-unit apartment complex and 567 parking spaces. Construction would occur over an approximately 2-year period. Approximately 400,000 cubic yards of soils would be excavated at the project site and 100,000 cubic yards of soils would be used as fill material during the grading phases of construction. On-site activities would consist of the operation of off-road construction equipment, as well as on-site truck activities (e.g., haul trucks, water trucks, dump trucks, and concrete trucks). Off-site activities include emissions from construction vehicle trips. CalEEMod modeling was used to quantify the construction-related criteria air pollutant emissions. Output of the CalEEMod is provided in **Attachment A**.

Table 5, Project Construction Emissions (Unmitigated), shows the maximum daily construction emissions of ROG, NOX, PM10, and PM2.5 that would result from the construction of the proposed project. As indicated in **Table 5**, estimated average daily project construction emissions would not exceed the thresholds for ROG, PM10, and PM2.5. However, the proposed project's average daily NOx emissions would exceed thresholds, resulting in a significant impact.

Table 5
Project Construction Emissions (Unmitigated)

	Average Daily Emissions (pounds/day)			
Scenario	**ROG**	**NO_X**	**PM10 Exhaust**	**PM2.5 Exhaust**
Average Yearly Construction Emissions (tons/year)				
2020	0.81	13.02	0.31	0.29
2021	0.67	7.51	0.23	0.22
2022	2.67	1.56	0.07	0.06
Average Daily Emissions (lbs/day) [1]	11.86	63.11	1.74	1.63
Thresholds (lbs/day)	54	54	82	54
Exceeds Threshold?	***No***	**Yes**	***No***	***No***

Source: Impact Sciences, 2019.
[1] - Based on 700 construction days

To reduce the level of average daily NOx emissions, the project would implement **Mitigation Measure-AIR-1,** which requires the use of Tier 4 final off-road engines throughout the construction period. **Table 6, Project Construction Emissions (Mitigated)** shows the average daily construction emissions of criteria pollutants with the implementation of **Mitigation Measure-AIR-1**. As shown in **Table 6**, construction emissions would be reduced below BAAQMD's thresholds with the use of Tier 4 final off-road engines through the implementation of **Mitigation Measure-AIR-1**.[2] With mitigation, construction activities associated with the proposed project would not result in emissions that would have a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Therefore, emissions associated with the project construction would be less than significant with mitigation.

2 Construction emissions were modeled assuming Tier 4 Interim equipment would be used. Therefore, if Tier 4 Final equipment is not available, the modeling demonstrates that using Tier 4 Interim equipment would also reduce emissions to less than significant levels.

Table 6
Project Construction Emissions (Mitigated)

	Average Daily Emissions (pounds/day)			
Scenario	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Average Yearly Construction Emissions (tons/year)				
2020	0.37	9.42	0.04	0.82
2021	0.34	5.38	0.03	0.48
2022	2.57	0.93	<0.01	0.26
Average Daily Emissions (lbs/day) [1]	9.37	44.94	0.20	4.43
Thresholds (lbs/day)	54	54	82	54
Exceeds Threshold?	***No***	***No***	***No***	***No***

Source: Impact Sciences, 2019.
1 - based on 700 construction days

Mitigation Measures

MM-AIR-1 For the entire duration of construction period, all off-road equipment greater than 25 horsepower shall have engines rated by the United States Environmental Protection Agency as having Tier 4 final emission limits.

Significance after Mitigation: With implementation of **Mitigation Measure-AIR-1**, the project's construction emissions would be less than significant.

Operational Impacts

Operational air pollutant emissions would be generated primarily by automobiles driven by future residents who would occupy the project site. Other sources of operational emissions include architectural coatings and maintenance products, consumer products, and energy use on the project site, including the combustion of natural gas in stoves, and heaters. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build out. The CalEEMod operational emissions modeling outputs are provided in **Attachment A.**

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 used by CalEEMod. The earliest year the project could possibly be constructed and fully occupied would be 2022. Emissions associated with project build-out later than 2022 would be lower, because newer vehicles have to meet increasingly more stringent emissions standards, while older, more polluting, vehicles would be less utilized.

The proposed project would generate approximately 2,032 daily trips during the operation period (TJKM, 2019). **Table 7, Project Operational Emissions,** shows the predicted daily operational emissions in pounds per day and tons per year. As shown in **Table 7**, daily emissions of ROG, NOx, PM10, and PM2.5 associated with operation of the proposed project would be below the BAAQMD significance thresholds. Therefore, project operations would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standard. In addition, project operations are not anticipated to result in a significant increase in adverse health effects on sensitive receptors in the region. As such, impact of the project's operation emissions on regional air quality would be less than significant.

Table 7
Project Operational Emissions

	Estimated Emissions			
Emissions Source	**ROG**	**NOx**	**PM10 Exhaust**	**PM2.5 Exhaust**
Area Source (tons/year)	2.42	0.04	0.16	0.16
Energy Source (tons/year)	0.02	0.15	0.01	0.01
Mobile Source (tons/year)	0.50	2.31	0.02	0.01
Stationary Source (tons/year)	-	-	0	0
Annual Project Operational Emissions (tons/year)	2.94	2.51	0.19	0.18
Annual Thresholds (tons/year)	*10*	*10*	*15*	*10*
Exceeds Threshold?	***No***	***No***	***No***	***No***
Average Daily Emissions (pounds/day)	16.11	13.75	1.04	0.97
Daily Thresholds (pounds/day)	*54*	*54*	*82*	*54*
Exceeds Threshold?	***No***	***No***	***No***	***No***

Source: Impact Sciences, 2019

Significance after Mitigation: No mitigation measures are required.

Health Risk Assessment

Construction Health Risk Impacts

Temporary project impacts related to health risk can occur from project construction activity, which would generate dust and equipment exhaust that could affect nearby sensitive receptors. Construction of the proposed project would include site clearance and grading, placement of utilities, building construction, paving, application of architectural coatings, and interior finishing. Construction equipment and associated heavy-duty truck trips generate exhaust which contains diesel particulate matter (DPM), known as a toxic air contaminant (TAC).

Construction emissions were estimated from CalEEMod and dispersion modeling was conducted to predict the off-site concentration resulting from project construction, so that lifetime excess cancer risk and non-cancer health risk could be predicted. The HRA was conducted following methods in the Office of Environmental Health Hazard Assessment's (OEHHA) *Guidance Manual for Preparation of Health Risk Assessments* and BAAQMD's *CEQA Guidance*. The cancer and non-cancer risks were compared to BAAQMD's thresholds, which include:

- Increased cancer risk of >10.0 in one million;
- Increased non-cancer risk of >1.0 Hazard Index;
- Ambient PM2.5 increase: >0.3 $\mu g/m^3$.

The BAAQMD recommends evaluating health risk posed to sensitive receptors (which are defined as residences, day care centers, schools and elderly facilities) from DPM within 1,000 feet radius of a project site (BAAQMD 2017). The closest sensitive receptors within 1,000 feet from the project site include residences east of Pleasant Hill Road and northwest of Deer Hill Road. Other sensitive receptors in the project vicinity include Acalanes High School and the First Step Learning Center Daycare—both located at approximately 250 and 1,100 feet, respectively, from the project site east of Pleasant Hill Road.

Health risks were evaluated for a hypothetical maximally exposed individual (MEI) located near the project site. The hypothetical MEI is an individual assumed to be located where the highest concentrations of air pollutants are predicted to occur as a result of project construction. As presented in **Table 8, Nearby Sensitive Receptors**, the nearest sensitive receptor is a single-family residence approximately 140 feet east of the project site.

Table 8
Nearby Sensitive Receptors

Name	Description	Distance (Feet)	Direction
Nearest Residence	Single Family Residential	140	East
Acalanes High School	High School	250	Northeast
First Step Learning School	Day Care	1,100	East

Source: Impact Sciences, 2019.

Cancer Risk. The CalEEMod model provided total annual PM10 exhaust emissions (assumed to be DPM) from off-road construction equipment used during project construction and exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles). Fugitive dust PM2.5 emissions were also computed in CalEEMod and included in this analysis.

The US EPA AERMOD dispersion model was used to predict concentrations of DPM and PM2.5 at sensitive receptors within 1,000 feet of the project site, as recommended by the BAAQMD (BAAQMD, 2017). To model emissions, a release height of 3 meters was chosen to represent the release height of construction equipment. Emissions from off-road construction equipment and on-road vehicle travel were distributed throughout the modeled area source. The modeling used the latest available 5-year meteorological data set (2009 to 2014) from the San Francisco International Airport prepared for use with the AERMOD model by the California Air Resources Board (CARB). Annual DPM and PM2.5 concentrations from construction activities were calculated at nearby sensitive receptor locations within the default receptor height. The concentration of DPM at the nearest sensitive receptor estimated in AERMOD was utilized to calculate the cancer risk in accordance with OEHHA guidelines.

The current OEHHA guidance recommends that cancer risks be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, it recommends evaluating the risks for the third trimester of pregnancy to age zero (third trimester exposure), ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 30 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposure, an ASF of 3 for 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 kilograms 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 exposure, and 80th percentile breathing rates are used for child and adult exposure. These age-specific breathing rates are 361 L/kg-day for the third trimester receptor, 1,090 L/kg-day for the infant receptors, 572 L/kg-day for child receptors, and 261 L/kg-day for adult receptors. Additionally, age-specific fraction of time at home (FAH) values were used in this analysis. According to OEHHA, FAH values of 0.85 should be used for the third trimester and infant receptors, 0.72 for the child receptors, and 0.73 for adult receptors. Finally, it was assumed that each receptor would have an exposure duration of 350 days per year, consistent with OEHHA guidelines (OEHHA 2015). According to OEHHA, the cancer risk for a residential receptor is assumed to start in the third trimester of life. Since project construction is anticipated to last approximately two years, the highest risk posed to the nearest sensitive receptor during construction would occur during the third trimester and infant stages of life. The health risk was also calculated for an adult receptor during construction of the project. As noted by OEHHA, infants and children are more susceptible to cancer risks, therefore, the infant and third-trimester risk represents the most conservative risk assessment.

The California Air Resources Board recommends the Hotspots Analysis and Reporting Program (HARP) to calculate the excess cancer risk. HARP incorporates OEHHA 2015 guidance in order to calculate the risk posed to receptors from facility operations. The methodology used to calculate the cancer risk is consistent with HARP.

As noted above, the maximum DPM concentration from construction activities would occur at a receptor approximately 140 feet east of the project site. Third trimester and infant exposures were conservatively assumed to occur at this residence through the entire construction period. Results of this assessment indicate that the maximum excess residential cancer risk posed to both the third trimester and infant receptors over the approximately two years of construction, without mitigation, would be a total of 27.92 in one million and exceed BAAQMD thresholds. The cancer risk posed to an adult receptor during construction, without mitigation, is approximately 0.09 in one million and less than the BAAQMD's threshold. The results of the health risk assessment are provided in **Table 9, Maximum Health Risks from Project Construction Activities (Unmitigated)**.

Non-Cancer Health Hazards. Sensitive groups can also develop non-cancer health risks from exposure to TACs. Non-cancer health risks are evaluated from the ratio of TAC concentrations generated by the project and a reference exposure level (REL). A REL is the concentration of a given pollutant in the air at or below which no adverse health effects are anticipated for sensitive groups (OEHHA 2015). RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. The chronic inhalation

REL for DPM is 5 μg/m³ (OEHHA, 2019). The ratio of TAC generated by a project and the REL is referred to as a hazard quotient/index (HI). According to the BAAQMD, the non-cancer health hazard would be significant if the HI exceeds 1.0.

The maximum computed HI based on the calculated DPM concentration from construction activities of the proposed project, without mitigation, would be 0.022, which is substantially lower than the BAAQMD significance criterion, see **Table 9**.

PM2.5 Emissions. PM2.5 can result from both exhaust emissions and fugitive dust. According to the BAAQMD, the ambient PM2.5 would be significant if its annual average concentration exceeds 0.3 μ/m³. As noted above, AERMOD was used to estimate the PM2.5 concentration at the nearest sensitive receptor based on emission estimates from CalEEMod. The maximum concentration of PM2.5 resulting from construction activities associated with the proposed project, without mitigation, would be 0.367 μg/m³. As shown in **Table 9**, the excess cancer risk and annual PM2.5 emissions that would result from project construction would exceed BAAQMD thresholds.

Table 9
Maximum Health Risks from Project Construction Activities (Unmitigated)

Receptor	Lifetime Excess Cancer Risk (per million)	Annual PM2.5 (μg/m³)*	Hazard Index
3rd Trimester	1.32	0.367	0.022
Infant	26.6	0.367	0.022
Adult	.09	0.367	0.022
Significance Threshold	10	0.3	1.0
Exceeds Threshold?	***Yes***	***Yes***	***No***

Source: Impact Sciences, 2019
**The annual PM2.5 concentration is the sum of the DPM and fugitive PM2.5 concentrations.*

Assuming implementation of **Mitigation Measure AIR-1**, which would require the project to utilize Tier 4 final off-road construction engines throughout the construction duration, the total excess cancer risk posed to a third trimester and infant receptors as a result of construction activities associated with the proposed project would be 2.94 in one million and the annual PM2.5 concentration would be 0.148 μg/m³ (see **Table 10, Maximum Health Risks from Project Construction Activities [Mitigated]**). Additionally, the cancer risk posed to an adult receptor living at the nearest residence during project construction would be 0.0095 in one million. These amounts are below the thresholds of significance. Therefore, health risk associated with project construction would be less than significant.

Table 10
Maximum Health Risks from Project Construction Activities (Mitigated)

Receptor	Lifetime Excess Cancer Risk (per million)	Annual PM2.5 (μg/m³)*	Hazard Index
3rd Trimester	0.14	0.148	.002
Infant	2.8	0.148	.002
Adult	.0095	0.148	.002
Significance Threshold	10	0.3	1.0
Exceeds Threshold?	***No***	***No***	***No***

Source: Impact Sciences, 2019
**The annual PM2.5 concentration is the sum of the DPM and fugitive PM2.5 concentrations.*

Operational Health Risk Impacts

Project-operation impacts related to increased health risk can occur either by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors, or by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs.

The proposed project does not include any stationary sources of TAC emissions and the vast majority of project vehicles would operate on gasoline and not diesel, which is the primary source of TACs and DPM. Therefore, operation of the proposed project would not generate TAC or PM2.5 emissions that could affect the health of the community near the project site. As such, the proposed project would not contribute to human health risk to nearby receptors during operation, and the project would also not contribute to any cumulative human health risk impact.

However, the proposed project would include the construction of a 315-unit apartment complex, and therefore, would introduce new sensitive receptors on the project site. The BAAQMD recommends that the lead agency identify all TAC and PM2.5 sources located within a 1,000-foot radius of the project site including permitted sources of TAC emissions as well as freeways, major roadways, and other potential sources. The BAAQMD provides thresholds for operation emissions related to cancer risk, hazard index, and particulate matter concentrations for facilities and major roadways (BAAQMD 2017).

- Increased cancer risk of >100 in one million;
- Increased non-cancer risk of >10 Hazard Index;
- Ambient PM2.5 increase: >0.8 μg/m^3.

Table 11, Cumulative Health Risk Impacts due to Project Operation shows the emissions sources near the project site and presents the results regarding health risk during project operation. As shown in **Table 11**, health risk on sensitive receptors at the project site would not exceed BAAQMD's cumulative thresholds for cancer risk, non-cancer health risk, and PM2.5 concentration. Therefore, the risk posed to new receptors during project operation would be less than significant.

Table 11
Cumulative Health Risk Impacts due to Project Operations

Source	Estimated Cancer Risk (cases per million)	Non-cancer Health Risk/Hazard Index	Estimated PM2.5 Concentration (μg/m^3)
Shell Oil Company	0.626	0.0009	N/A
Svensson Automotive	0	0	0
State Route 24	40.98	0.039	0.382
Pleasant Hill Road	4.01	-	0.101
Deer Hill Road	1.76	-	0.045
Total	**47.37**	**0.039**	**0.523**
Cumulative Threshold	100 in one million	10	0.8 μg/m^3
Threshold exceeded?	***No***	***No***	***No***

Source: Impact Sciences, 2019

Greenhouse Gas Emissions

Existing Conditions

Global climate change refers to any significant change in climate measurements, such as temperature, precipitation, or wind, lasting for an extended period (i.e., decades or longer) (US EPA 2013). Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- Natural processes within the climate system (e.g., changes in ocean circulation, reduction in sunlight from the addition of greenhouse gases (GHGs) and other gases to the atmosphere from volcanic eruptions); and
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification).

In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts were observed to be due to climate change, irrespective of its cause. This indicates the sensitivity of natural and human systems to changing climate (IPCC 2013). Continuing changes to the global climate system and ecosystems are projected to include:

- Rapidly diminishing sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (IPCC 2013);
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and ice sheets;
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;
- Changing levels in snowpack, river flow and sea levels indicating that climate change is already affecting California's water resources (Cal EPA 2010);
- Dry seasons that start earlier and end later, evoking more frequent and intense wildland fires (Cal EPA 2010); and
- Increasing demand for electricity due to rising temperatures (Cal EPA 2010).

The natural process through which heat is retained in the troposphere[3] is called the "greenhouse effect." Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere as short wave radiation. It travels through the atmosphere without warming it and is absorbed by the Earth's surface. When the Earth re-emits this radiation back toward space, the radiation changes to long wave radiation. GHGs are transparent to incoming short-wave solar radiation but absorb outgoing long wave radiation. As a result, radiation that otherwise would escape back into space is now retained, warming the atmosphere. This phenomenon is known as the greenhouse effect.

California State law defines GHGs to include the following six compounds:

- **Carbon Dioxide** (CO_2) released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned. CO_2 emissions from motor vehicles occur during operation of vehicles and operation of air conditioning systems.
- **Methane** (CH_4) emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in solid waste landfills, raising livestock, natural gas and petroleum systems, stationary and mobile combustion, and wastewater treatment.
- **Nitrous Oxide** (N_2O) emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. N_2O emissions from motor vehicles generally occur directly from operation of vehicles.
- **Hydrofluorocarbons** (HFCs) one of several high global warming potential (GWP) gases that are not naturally occurring and are generated from industrial processes. HFC (refrigerant) emissions from vehicle air conditioning systems occur due to leakage, losses during recharging, or release from scrapping vehicles at end of their useful life.
- **Perfluorocarbons** (PFCs) other high GWP gases that are not naturally occurring and are generated in a variety of industrial processes. Emissions of PFCs are generally negligible from motor vehicles.
- **Sulfur Hexafluoride** (SF_6) another high GWP gas that is not naturally occurring and is generated in a variety of industrial processes. Emissions of SF_6 are generally negligible from motor vehicles.

3 The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface from 6 to 7 miles).

Significance Criteria

Project Construction. The BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, the BAAQMD recommends quantification and disclosure of GHG construction emissions. Determining the significance of these construction-generated GHG emission impacts is recommended to be made in relation to meeting Assembly Bill (AB) 32 GHG reduction goals, which requires the state to meet 1990 levels of GHG emissions by 2020.

Since GHG emissions are cumulative and construction emission are temporary and short term, it is common practice to amortize the total construction GHG emissions over 30 years to create an annual emissions rate that is combined with the operational GHG emissions for determining significance.

Project Operation. The BAAQMD *CEQA Air Quality Guidelines* provide numeric thresholds for GHG emissions during project operation. A proposed land use development project would not have a significant GHG impact, if operation of the project would meet one of the following thresholds:

- Compliance with a qualified GHG Reduction Strategy;
- Annual emissions less than 1,100 metric tons per year (MT/yr) of CO_2e; or
- 4.6 metric tons of CO_2e per service population[4] per year (MT CO_2e/SP/yr)

If annual emissions of GHGs exceed these threshold levels, the proposed project would result in a cumulatively considerable contribution of GHG emissions and must implement mitigation measures.

Project GHG emissions during operation include direct and indirect sources emissions. Direct emissions occur as a result of onsite equipment, and also off-site sources directly related to the project, such as emissions from vehicle trips. Indirect emissions occur as a result of a project's actions but are produced from sources not owned or controlled by the project, such as off-site emissions from electricity generation, water conveyance, and waste disposal.

The BAAQMD developed GHG thresholds considering the Bay Area GHG inventory and the effects of AB 32 scoping plan measures that would reduce regional emissions. By using these thresholds, the BAAQMD intended to achieve GHG reductions from new land use developments to close the gap between projected

4 According to the BAAQMD's *CEQA Guidelines*, a service population is determined by adding the number of residents to the number of jobs estimated for a given point in time.

regional emissions and the AB 32 emission reduction targets. However, the thresholds were designed for compliance with AB 32 target date of 2020. In 2016, California approved Senate Bill (SB) 32, which requires the state emissions to be 40 percent below 1990 levels by 2030. As such, BAAQMD has recommended that for projects that would become operational after 2020, lead agencies should consider developing additional thresholds to evaluate a project's GHG impact. In establishing those thresholds, a lead agency may appropriately look to thresholds developed by other public agencies, or suggested by other experts, as long as any threshold chosen is supported by substantial evidence (See CEQA Guidelines Section 15064.7(c)) (BAAQMD 2017). In the case of the proposed project, the City of Lafayette is using the Bay Area's SB 32 target of 2.77 MT CO2e per service population per year (MT CO2e/sp/year), as calculated below, as the threshold to assess GHG emissions impact of project operation.

Based on the current schedule, the proposed project is anticipated to be fully constructed and occupied by 2022. The project's emissions would essentially occur in the years after 2020. In order to evaluate the project's impact, a new efficiency metric was developed to calculate the 2030 threshold in compliance with SB (32).

The methodology used to calculate the 2030 threshold is similar to the one used by BAAQMD to calculate the 2020 threshold (BAAQMD 2017). As presented below in **Table 12, 2030 GHG Efficiency Threshold**, the estimated 2030 statewide emissions target of approximately 179 MT CO2e/year is based on a 40 percent reduction of the 1990 state emissions of 563.5 MT CO2e/year and adjusted for the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) global warming potentials (GWP) for consistency with the rest of the state GHG inventory. Global warming potential is a measure of how much heat a greenhouse gas traps in the atmosphere in relation to carbon dioxide. CARB 's most recent state GHG inventory uses the 2007 IPCC AR4 GWP to calculate the annual emissions (CARB, 2019).

The state of California's 2030 service population was calculated by adding the 2030 projected population and 2030 projected employment, consistent with the BAAQMD methodology in calculating 2020 thresholds. As shown in **Table 12, 2030 GHG Efficiency Threshold**, the estimated 2030 GHG emission threshold of 2.77 MT CO_2e/sp/year is the ratio of the 2030 California emissions target and service population. GHG emissions of the proposed project above this threshold would be considered significant. This analysis is not intended to demonstrate consistency with any plan for reducing GHG emissions.

Table 12
2030 GHG Efficiency Threshold

Current BAAQMD Threshold (2020)	**Year 2020**
Land Use Sectors Greenhouse Gas Emissions Target (MT CO2e/year)	295,530,000
Population	44,135,923
Employment	20,194,661
California Service Population	64,330,584
SB 32 Goal (MT CO2e/SP/yr)	***4.59***
Estimated 2030 Threshold	**Year 2030**
Land Use Sectors Greenhouse Gas Emissions Target (MT CO2e/year - Emissions adjusted by AR4 GWP and reduction target for 2030)	178,979,059
Population [a]	43,631,295
Employment [b]	20,879,672
California Service Population	64,510,967
SB 32 Goal (MT CO2e/SP/yr)	**2.77**

Source:
[a] Department of Finance. Report P-1 (County): State and County Table Population Projects, 2010-2060. Available online at: http://www.dof.ca.gov/Forecasting/Demographics/Projections/.
[b] California's total employment is projected to increase by approximately 10.7% from 2016 to 2026, resulting in a total employment level of 20,022,700 people by 2026. Assuming the same annual average growth rate (1.07% per year) from 2026 to 2030, there will be an estimated 20,879,672 employees across California.
California Employment Development Department. Employment Projections: Long-Term Projections (Ten-Years). Available online at: https://www.labormarketinfo.edd.ca.gov/data/employment-projections.html, accessed November 25, 2019.

Construction Impacts

Using CalEEMod, project GHG emissions throughout the construction phase were calculated from off-road equipment usage, hauling vehicles, delivery, and worker vehicle trips to and from the site. As shown in **Table 13, Project GHG Emissions – Construction Phase**, the total GHG construction emissions over the approximately two-year construction duration of the proposed project would be approximately 2,539 MT CO2e. As GHG emissions impact from construction activities would occur over a relatively short time span, it would contribute a relatively small portion of the lifetime GHG emission impact of the proposed project. The total construction GHG emissions were divided by 30 to determine an annual construction emission rate estimate to be amortized over the project's first 30 years of operational life, consistent with CEQA analysis across the state.

As presented in **Table 13, Project GHG Emissions – Construction Phase**, amortized over a 30-year period, the proposed project is anticipated to emit approximately 84.63 MT CO2e/year. Implementation of **Mitigation Measure Air-1,** which requires the use of Tier 4 final off-road engines, would comply with BAAQMD recommendations for best management practices to reduce GHG emissions during construction.

Table 13
Project GHG Emissions – Construction Phase

Source	Emissions (MT CO2e)
Total Construction Emissions	2,539
30-year Amortized Construction Emissions	84.63

Source: Impact Sciences, 2019.

Operational Impacts

BAAQMD-recommended CalEEMod was also used to calculate the annual GHG emissions generated by the proposed project during operation. Sources of GHG emissions during operation include emissions from area sources, electricity, mobile sources, waste, and water. Amortized yearly construction emissions were added to operational GHG emissions to calculate the project's total annual GHG emissions.

Emissions from area sources are based on land use sizes, GHG emission factors for fuel combustion, and the global warming potential (GWP) values for the GHGs emitted. Electricity usage emissions are based on the land uses, default demand factors for the land use, GHG emission factors for the utility provider, and the GWP values of the GHGs emitted. Mobile-source GHG emissions are determined based on the project's estimated daily trip rate calculated in the Traffic Impact Report prepared for the proposed project (TJKM 2019). Waste and water emissions are derived from the anticipated water usage and wastewater generated based on the project's proposed land uses and the associated water demand factors.

As shown in **Table 14 - Project GHG Emissions – Operational Phase, Unmitigated** the proposed project's GHG operational emissions would be 2,674 MT CO2e/year. With an estimated project service population of 901 residents,[5] GHG emissions of the proposed project per service population would be approximately 2.97 MT CO_2e/capita/year. Therefore, the project GHG emissions during the operation phase would be below the BAAQMD's 2020 efficiency threshold of 4.6 MT CO_2e/capita/year. However, these emissions would be above the estimated 2030 GHG emissions threshold of 2.77 MT CO_2e/capita/year.

[5] Number of residents based on the CalEEMod modeling provided in Attachment A. As the proposed project is a residential development, it is not anticipated to generate any employees. As a result, the service population only includes the anticipated number of residents.

Table 14
Project GHG Emissions – Annual Operation Emissions, Unmitigated

Source	Emissions (in MTCO2e)
Construction Amortized	85
Area	25
Energy	595.7
Mobile	1,821
Waste	72.9
Water	73.6
Total Operational Emissions (2022)	**2,674**
Per Capita Emissions[1]	2.97 MT/capita/year
BAAQMD 2020 Efficiency Threshold	4.6 MT/capita/year
Exceed Threshold?	***No***
SB 32 based 2030 Efficiency Threshold	2.77 MT/capita/year
Exceed Threshold?	**Yes**

Source: Impact Sciences, 2019.

[1] Based on a project service population of 901 residents.

The proposed project would implement **Mitigation Measures GHG-1** through **GHG-6** which requires the applicant to implement measures aimed at reducing on-site GHG emissions. Many of these measures can be quantified within the CalEEMod model in order to determine the mitigated project GHG emissions.

In order to calculate a project-specific reduction for **Mitigation Measure GHG-4**, which requires the Resumed Project to incorporate 56 electric vehicle (EV) parking spaces, emission reductions were calculated based on a technical analysis produced by the California Air Resources Board (CARB) in 2018 to study the effectiveness of EV charging stations.

This estimate of annual GHG emissions reductions for residential EV charging units conservatively assumes that each unit will be used to charge one electric vehicle that travels the average number of miles per year for vehicles in the BAAQMD based on CARB's EMFAC2017 Web Database for the year 2022 (earliest operational year), and that 80% of electric vehicle charging activity occurs at home, based on a study of electric vehicle use prepared by an industry expert in 2018.[6] Since an EV charging station will indirectly produce GHG emissions through electrical production and transfer, the net reductions per residential EV charging unit were calculated by taking into consideration the amount of GHG emissions produced per MWh of electrical production according to Pacific Gas and Electric.[7] See **Attachment B** for detailed calculations.

As shown in **Table 15, Estimated GHG Reduction from EV Parking**, implementation of 56 EV parking spaces would result in an annual reduction of 120 MT CO2e/year.

Table 15
Estimated GHG Reduction from EV Parking

Number of Units	Emissions (MT CO2e/year)
Net GHG Emissions Reductions per Residential EV Charging Unit [a]	2.15
Total Reduction (56 Units)	120

***SOURCE**: CARB. 2018. Electric Vehicle (EV) Charging Infrastructure: Multifamily Building Standards. Available: https://ww3.arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf; CARB. EMFAC2017 Web Database. Available: https://www.arb.ca.gov/emfac/2017/; CARB. 2018. Emfac2017 Volume III – Technical Documentation. Available: https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-iii-technical-documentation.pdf.*

As shown in **Table 16, Project GHG Emissions – Annual Operation Emissions, Mitigated** the proposed project's annual GHG operational emissions would be 2,291 MT CO2e/year. With an estimated service population of 901 residents, GHG emissions of the proposed project per service population would be approximately 2.54 MT CO2e/capita/year. Therefore, the project GHG emissions during the operation phase would be below the BAAQMD's 2020 efficiency threshold of 4.6 MT CO_2e/capita/year as well as the estimated 2030 GHG emissions threshold of 2.77 CO_2e/capita/year.

6 Electric Power Research Institute, *Electric Vehicle Driving, Charging, and Load Shape Analysis Report* (July 2018), available at: https://www.epri.com/#/pages/product/3002013754/?lang=en-US.

7 Pacific Gas and Electric. *Climate Change*. Available at: http://www.pgecorp.com/corp_responsibility/reports/2017/en02_climate_change.html.

Table 14
Project GHG Emissions – Annual Operation Emissions, Mitigated

Source	Emissions (in MTCO2e)
Construction Amortized	85
Area	25
Energy	345
Mobile	1,821
Waste	72.9
Water	61.5
Reduction from MM-GHG-3	-120
Total Operational Emissions (2022)	**2,291**
Per Capita Emissions[1]	2.54 MT/capita/year
BAAQMD 2020 Efficiency Threshold	4.6 MT/capita/year
Exceed Threshold?	***No***
SB 32 based 2030 Efficiency Threshold	2.77 MT/capita/year
Exceed Threshold?	***No***

Source: Impact Sciences, 2019.

[1] Based on a project service population of 901 residents

Mitigation Measure GHG-1a: The City shall verify that residential units/buildings comply with one of the following:

– Ensure that 157 residential units are constructed without fireplaces (fireplaces are acceptable in the other 158 residential units).

– Building the residential units to achieve a 25 percent reduction in building energy efficiency compared to the 2008 Building and Energy Efficiency Standards, which is equivalent to the new 2013 Building and Energy Efficiency Standards.

– Build the residential units to achieve a 15 percent reduction in building energy efficiency compared to the 2008 Building and Energy Efficiency Standards AND ensure that 78 residential units are constructed without fireplaces (fireplaces are acceptable in the other 237 residential units).

Mitigation Measure GHG-1b: Implement **Mitigation Measure TRAF-14**. The Project applicant shall provide subsidized, frequent shuttle service between the Project site and the Lafayette BART station during the AM and PM peak commute peak periods, until such time that a bus route on Pleasant Hill Road serving the BART station is implemented (as called for in the Lamorinda Action Plan), at which point the Project applicant may provide transit vouchers in lieu of a shuttle.

Mitigation Measure GHG-2: The project will install ENERGY STAR rated appliances including clothes washers, dishwashers, fans, and refrigerators in order to reduce the apartment complex's natural gas combustion and energy demand.

Mitigation Measure GHG-3: The project will install low-flow water fixtures including faucets, toilets, and showers, in order to reduce water demand, energy demand, and associated indirect GHG emissions.

Mitigation Measure GHG-4: Consistent with CARB recommendations that multi-family projects should install EV parking in at least 10% of their parking stalls, the project will install 56 EV parking stalls.

Mitigation Measure GHG-5: Consistent with the Addendum, the project will achieve an energy efficiency 25% greater than required in Title 24.

Mitigation Measure GHG-6: The project will install solar panels on the carports and fourteen residential buildings that will generate over half the energy required by the proposed apartment complex.

Significance after Mitigation: With implementation of **Mitigation Measures-GHG-1** through **GHG-6** the project's GHG emissions would be less than significant.

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Attachment A

CalEEMod and AERMOD Modeling Output Files

Lafayette

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	567.00	Space	5.10	226,800.00	0
Apartments Low Rise	315.00	Dwelling Unit	19.69	346,645.00	901

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - leasing office and club house included in apartment square footage

Construction Phase - schedule per the Project Applicant

Trips and VMT - Input a total of 400,000 cy of grading export and 100,000 cy of grading import.

Grading -

Vehicle Trips - per the TIA

Woodstoves -

Construction Off-road Equipment Mitigation - per proposed mitigation

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation - Per the Addendum, "Build the residential units to achieve a 25 percent reduction in buidling energy efficiency compared to the 2008 Building and Energy Efficiency Standards, which is equivalent to the new 2013 Building and Energy Efficiency Standards."
The Project is anticipated to install solar panels that will exceed 50% of the project's energy use.

Water Mitigation -

Sequestration -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	19.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	20.00	108.00
tblConstructionPhase	NumDays	370.00	392.00
tblConstructionPhase	NumDays	20.00	21.00
tblConstructionPhase	NumDays	35.00	110.00
tblConstructionPhase	NumDays	35.00	45.00
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	10.00	88.00

tblConstructionPhase	NumDays	10.00	45.00
tblGrading	MaterialExported	0.00	300,000.00
tblGrading	MaterialExported	0.00	100,000.00
tblGrading	MaterialImported	0.00	75,000.00
tblGrading	MaterialImported	0.00	25,000.00
tblLandUse	LandUseSquareFeet	315,000.00	346,645.00
tblSequestration	NumberOfNewTrees	0.00	700.00
tblVehicleTrips	ST_TR	7.16	6.45
tblVehicleTrips	SU_TR	6.07	6.45
tblVehicleTrips	WD_TR	6.59	6.45

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					
2020	0.8119	13.0213	5.4872	0.0270	1.8088	0.3115	2.1203	0.7790	0.2884	1.0674	0.0000	2,531.7760	2,531.7760	0.2718	0.0000	2,538.5700
2021	0.6747	7.5148	5.1385	0.0178	1.1434	0.2342	1.3776	0.4502	0.2183	0.6685	0.0000	1,635.6307	1,635.6307	0.1874	0.0000	1,640.3152
2022	2.6720	1.5645	1.4211	3.5100e-003	0.5262	0.0674	0.5936	0.2531	0.0629	0.3160	0.0000	314.2670	314.2670	0.0473	0.0000	315.4499
Maximum	**2.6720**	**13.0213**	**5.4872**	**0.0270**	**1.8088**	**0.3115**	**2.1203**	**0.7790**	**0.2884**	**1.0674**	**0.0000**	**2,531.7760**	**2,531.7760**	**0.2718**	**0.0000**	**2,538.5700**

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					
2020	0.3705	9.4213	5.9355	0.0270	1.0975	0.0370	1.1346	0.3994	0.0359	0.4354	0.0000	2,531.7753	2,531.7753	0.2718	0.0000	2,538.5693
2021	0.3427	5.3843	5.5092	0.0178	0.8086	0.0261	0.8347	0.2685	0.0256	0.2940	0.0000	1,635.6300	1,635.6300	0.1874	0.0000	1,640.3146
2022	2.5713	0.9325	1.5430	3.5100e-003	0.3076	5.5100e-003	0.3131	0.1231	5.4400e-003	0.1285	0.0000	314.2668	314.2668	0.0473	0.0000	315.4497
Maximum	**2.5713**	**9.4213**	**5.9355**	**0.0270**	**1.0975**	**0.0370**	**1.1346**	**0.3994**	**0.0359**	**0.4354**	**0.0000**	**2,531.7753**	**2,531.7753**	**0.2718**	**0.0000**	**2,538.5693**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**21.02**	**28.79**	**-7.81**	**0.00**	**36.36**	**88.80**	**44.22**	**46.64**	**88.25**	**58.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**5-1-2020**	**7-31-2020**	4.8058	3.4530
2	**8-1-2020**	**10-31-2020**	8.0712	5.6439
3	**11-1-2020**	**1-31-2021**	1.0109	0.7088
4	**2-1-2021**	**4-30-2021**	5.2134	3.5748
5	**5-1-2021**	**7-31-2021**	0.9427	0.6821
6	**8-1-2021**	**10-31-2021**	0.9400	0.6808
7	**11-1-2021**	**1-31-2022**	1.4480	1.2056
8	**2-1-2022**	**4-30-2022**	2.8656	2.2225
9	**5-1-2022**	**7-31-2022**	0.5484	0.5427
		Highest	8.0712	5.6439

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	2.4152	0.0438	3.3475	2.1200e-003		0.1560	0.1560		0.1560	0.1560	14.3608	9.7294	24.0901	0.0268	9.4000e-004	25.0406
Energy	0.0173	0.1480	0.0630	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	593.0426	593.0426	0.0224	7.0900e-003	595.7134
Mobile	0.5040	2.3149	5.6837	0.0199	1.7524	0.0169	1.7693	0.4702	0.0158	0.4860	0.0000	1,819.352 9	1,819.352 9	0.0656	0.0000	1,820.992 0
Waste						0.0000	0.0000		0.0000	0.0000	29.4134	0.0000	29.4134	1.7383	0.0000	72.8704
Water						0.0000	0.0000		0.0000	0.0000	6.5112	45.4806	51.9918	0.6708	0.0162	73.5946
Total	**2.9366**	**2.5067**	**9.0941**	**0.0229**	**1.7524**	**0.1849**	**1.9373**	**0.4702**	**0.1838**	**0.6540**	**50.2853**	**2,467.605 5**	**2,517.890 8**	**2.5238**	**0.0243**	**2,588.211 0**

2.2 Overall Operational

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	2.4152	0.0438	3.3475	2.1200e-003		0.1560	0.1560		0.1560	0.1560	14.3608	9.7294	24.0901	0.0268	9.4000e-004	25.0406
Energy	0.0143	0.1225	0.0521	7.8000e-004		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	343.4502	343.4502	0.0118	4.4900e-003	345.0830
Mobile	0.5040	2.3149	5.6837	0.0199	1.7524	0.0169	1.7693	0.4702	0.0158	0.4860	0.0000	1,819.3529	1,819.3529	0.0656	0.0000	1,820.9920
Waste						0.0000	0.0000		0.0000	0.0000	29.4134	0.0000	29.4134	1.7383	0.0000	72.8704
Water						0.0000	0.0000		0.0000	0.0000	5.2089	39.0193	44.2283	0.5368	0.0130	61.5209
Total	**2.9336**	**2.4812**	**9.0832**	**0.0228**	**1.7524**	**0.1829**	**1.9353**	**0.4702**	**0.1818**	**0.6520**	**48.9831**	**2,211.5517**	**2,260.5348**	**2.3792**	**0.0184**	**2,325.5069**

	ROG	**NOx**	**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	**0.10**	**1.02**	**0.12**	**0.70**	**0.00**	**1.12**	**0.11**	**0.00**	**1.13**	**0.32**	**2.59**	**10.38**	**10.22**	**5.73**	**24.00**	**10.15**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	495.6000
Total	**495.6000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demo/Clearing	Demolition	5/1/2020	5/29/2020	5	21	
2	Mass Grading 1	Grading	6/1/2020	10/30/2020	5	110	
3	Utilities 1	Site Preparation	7/1/2020	10/30/2020	5	88	
4	Paving 1	Paving	9/1/2020	10/30/2020	5	44	
5	Building Construction	Building Construction	10/1/2020	4/1/2022	5	392	
6	Utilities 2	Site Preparation	3/1/2021	4/30/2021	5	45	
7	Mass Grading 2	Grading	3/1/2021	4/30/2021	5	45	
8	Paving 2	Paving	4/1/2021	5/1/2021	5	22	
9	Exterior Finishes	Architectural Coating	1/1/2022	6/1/2022	5	108	
10	Landscaping	Site Preparation	2/1/2022	4/1/2022	5	44	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.1

Residential Indoor: 701,956; Residential Outdoor: 233,985; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 13,608 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demo/Clearing	Concrete/Industrial Saws	1	8.00	81	0.73
Demo/Clearing	Excavators	3	8.00	158	0.38
Demo/Clearing	Rubber Tired Dozers	2	8.00	247	0.40
Mass Grading 1	Excavators	2	8.00	158	0.38
Mass Grading 1	Graders	1	8.00	187	0.41
Mass Grading 1	Rubber Tired Dozers	1	8.00	247	0.40
Mass Grading 1	Scrapers	2	8.00	367	0.48
Mass Grading 1	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Utilities 1	Rubber Tired Dozers	3	8.00	247	0.40
Utilities 1	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Paving 1	Pavers	2	8.00	130	0.42
Paving 1	Paving Equipment	2	8.00	132	0.36
Paving 1	Rollers	2	8.00	80	0.38
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
Utilities 2	Rubber Tired Dozers	3	8.00	247	0.40

Utilities 2	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Mass Grading 2	Excavators	2	8.00	158	0.38
Mass Grading 2	Graders	1	8.00	187	0.41
Mass Grading 2	Rubber Tired Dozers	1	8.00	247	0.40
Mass Grading 2	Scrapers	2	8.00	367	0.48
Mass Grading 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving 2	Pavers	2	8.00	130	0.42
Paving 2	Paving Equipment	2	8.00	132	0.36
Paving 2	Rollers	2	8.00	80	0.38
Exterior Finishes	Air Compressors	1	6.00	78	0.48
Landscaping	Rubber Tired Dozers	3	8.00	247	0.40
Landscaping	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demo/Clearing	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Mass Grading 1	8	20.00	0.00	46,875.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities 1	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving 1	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	322.00	71.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities 2	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Mass Grading 2	8	20.00	0.00	15,625.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving 2	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Exterior Finishes	1	64.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Landscaping	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demo/Clearing - 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	0.0348	0.3486	0.2284	4.1000e-004		0.0174	0.0174		0.0162	0.0162	0.0000	35.6985	35.6985	0.0101	0.0000	35.9505
Total	**0.0348**	**0.3486**	**0.2284**	**4.1000e-004**		**0.0174**	**0.0174**		**0.0162**	**0.0162**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9505**

3.2 Demo/Clearing - 2020

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	5.3000e-004	3.8000e-004	3.9600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0959	1.0959	3.0000e-005	0.0000	1.0965
Total	**5.3000e-004**	**3.8000e-004**	**3.9600e-003**	**1.0000e-005**	**1.2500e-003**	**1.0000e-005**	**1.2600e-003**	**3.3000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.0959**	**1.0959**	**3.0000e-005**	**0.0000**	**1.0965**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1300e-003	0.1424	0.2591	4.1000e-004		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	35.6985	35.6985	0.0101	0.0000	35.9504
Total	**6.1300e-003**	**0.1424**	**0.2591**	**4.1000e-004**		**6.5000e-004**	**6.5000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9504**

3.2 Demo/Clearing - 2020

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	5.3000e-004	3.8000e-004	3.9600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0959	1.0959	3.0000e-005	0.0000	1.0965
Total	**5.3000e-004**	**3.8000e-004**	**3.9600e-003**	**1.0000e-005**	**1.2500e-003**	**1.0000e-005**	**1.2600e-003**	**3.3000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.0959**	**1.0959**	**3.0000e-005**	**0.0000**	**1.0965**

3.3 Mass Grading 1 - 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					
Fugitive Dust					0.4982	0.0000	0.4982	0.2010	0.0000	0.2010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2448	2.7609	1.7577	3.4100e-003		0.1196	0.1196		0.1100	0.1100	0.0000	299.6636	299.6636	0.0969	0.0000	302.0865
Total	**0.2448**	**2.7609**	**1.7577**	**3.4100e-003**	**0.4982**	**0.1196**	**0.6178**	**0.2010**	**0.1100**	**0.3110**	**0.0000**	**299.6636**	**299.6636**	**0.0969**	**0.0000**	**302.0865**

3.3 Mass Grading 1 - 2020

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	0.1935	6.8026	1.2804	0.0184	0.3971	0.0224	0.4194	0.1092	0.0214	0.1306	0.0000	1,777.2167	1,777.2167	0.0791	0.0000	1,779.1935
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6900e-003	2.6700e-003	0.0276	8.0000e-005	8.7200e-003	6.0000e-005	8.7800e-003	2.3200e-003	5.0000e-005	2.3700e-003	0.0000	7.6537	7.6537	1.9000e-004	0.0000	7.6584
Total	**0.1972**	**6.8053**	**1.3080**	**0.0185**	**0.4058**	**0.0224**	**0.4282**	**0.1115**	**0.0215**	**0.1329**	**0.0000**	**1,784.8704**	**1,784.8704**	**0.0793**	**0.0000**	**1,786.8519**

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					0.2242	0.0000	0.2242	0.0814	0.0000	0.0814	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0556	1.0599	2.0197	3.4100e-003		5.5800e-003	5.5800e-003		5.5800e-003	5.5800e-003	0.0000	299.6633	299.6633	0.0969	0.0000	302.0862
Total	**0.0556**	**1.0599**	**2.0197**	**3.4100e-003**	**0.2242**	**5.5800e-003**	**0.2298**	**0.0814**	**5.5800e-003**	**0.0870**	**0.0000**	**299.6633**	**299.6633**	**0.0969**	**0.0000**	**302.0862**

3.3 Mass Grading 1 - 2020

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	0.1935	6.8026	1.2804	0.0184	0.3971	0.0224	0.4194	0.1092	0.0214	0.1306	0.0000	1,777.2167	1,777.2167	0.0791	0.0000	1,779.1935
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6900e-003	2.6700e-003	0.0276	8.0000e-005	8.7200e-003	6.0000e-005	8.7800e-003	2.3200e-003	5.0000e-005	2.3700e-003	0.0000	7.6537	7.6537	1.9000e-004	0.0000	7.6584
Total	**0.1972**	**6.8053**	**1.3080**	**0.0185**	**0.4058**	**0.0224**	**0.4282**	**0.1115**	**0.0215**	**0.1329**	**0.0000**	**1,784.8704**	**1,784.8704**	**0.0793**	**0.0000**	**1,786.8519**

3.4 Utilities 1 - 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					
Fugitive Dust					0.7949	0.0000	0.7949	0.4370	0.0000	0.4370	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1794	1.8664	0.9466	1.6700e-003		0.0967	0.0967		0.0890	0.0890	0.0000	147.0950	147.0950	0.0476	0.0000	148.2843
Total	**0.1794**	**1.8664**	**0.9466**	**1.6700e-003**	**0.7949**	**0.0967**	**0.8916**	**0.4370**	**0.0890**	**0.5259**	**0.0000**	**147.0950**	**147.0950**	**0.0476**	**0.0000**	**148.2843**

3.4 Utilities 1 - 2020

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	2.6600e-003	1.9200e-003	0.0199	6.0000e-005	6.2800e-003	4.0000e-005	6.3200e-003	1.6700e-003	4.0000e-005	1.7100e-003	0.0000	5.5107	5.5107	1.4000e-004	0.0000	5.5141
Total	**2.6600e-003**	**1.9200e-003**	**0.0199**	**6.0000e-005**	**6.2800e-003**	**4.0000e-005**	**6.3200e-003**	**1.6700e-003**	**4.0000e-005**	**1.7100e-003**	**0.0000**	**5.5107**	**5.5107**	**1.4000e-004**	**0.0000**	**5.5141**

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					0.3577	0.0000	0.3577	0.1770	0.0000	0.1770	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0307	0.5351	1.0102	1.6700e-003		2.7300e-003	2.7300e-003		2.7300e-003	2.7300e-003	0.0000	147.0948	147.0948	0.0476	0.0000	148.2842
Total	**0.0307**	**0.5351**	**1.0102**	**1.6700e-003**	**0.3577**	**2.7300e-003**	**0.3604**	**0.1770**	**2.7300e-003**	**0.1797**	**0.0000**	**147.0948**	**147.0948**	**0.0476**	**0.0000**	**148.2842**

3.4 Utilities 1 - 2020

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	2.6600e-003	1.9200e-003	0.0199	6.0000e-005	6.2800e-003	4.0000e-005	6.3200e-003	1.6700e-003	4.0000e-005	1.7100e-003	0.0000	5.5107	5.5107	1.4000e-004	0.0000	5.5141
Total	**2.6600e-003**	**1.9200e-003**	**0.0199**	**6.0000e-005**	**6.2800e-003**	**4.0000e-005**	**6.3200e-003**	**1.6700e-003**	**4.0000e-005**	**1.7100e-003**	**0.0000**	**5.5107**	**5.5107**	**1.4000e-004**	**0.0000**	**5.5141**

3.5 Paving 1 - 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	0.0298	0.3094	0.3224	5.0000e-004		0.0166	0.0166		0.0152	0.0152	0.0000	44.0621	44.0621	0.0143	0.0000	44.4184
Paving	6.6800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0365**	**0.3094**	**0.3224**	**5.0000e-004**		**0.0166**	**0.0166**		**0.0152**	**0.0152**	**0.0000**	**44.0621**	**44.0621**	**0.0143**	**0.0000**	**44.4184**

3.5 Paving 1 - 2020

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	1.1100e-003	8.0000e-004	8.2900e-003	3.0000e-005	2.6200e-003	2.0000e-005	2.6300e-003	7.0000e-004	2.0000e-005	7.1000e-004	0.0000	2.2961	2.2961	6.0000e-005	0.0000	2.2975
Total	**1.1100e-003**	**8.0000e-004**	**8.2900e-003**	**3.0000e-005**	**2.6200e-003**	**2.0000e-005**	**2.6300e-003**	**7.0000e-004**	**2.0000e-005**	**7.1000e-004**	**0.0000**	**2.2961**	**2.2961**	**6.0000e-005**	**0.0000**	**2.2975**

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	7.3500e-003	0.2209	0.3805	5.0000e-004		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	44.0620	44.0620	0.0143	0.0000	44.4183
Paving	6.6800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0140**	**0.2209**	**0.3805**	**5.0000e-004**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**44.0620**	**44.0620**	**0.0143**	**0.0000**	**44.4183**

3.5 Paving 1 - 2020

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	1.1100e-003	8.0000e-004	8.2900e-003	3.0000e-005	2.6200e-003	2.0000e-005	2.6300e-003	7.0000e-004	2.0000e-005	7.1000e-004	0.0000	2.2961	2.2961	6.0000e-005	0.0000	2.2975
Total	**1.1100e-003**	**8.0000e-004**	**8.2900e-003**	**3.0000e-005**	**2.6200e-003**	**2.0000e-005**	**2.6300e-003**	**7.0000e-004**	**2.0000e-005**	**7.1000e-004**	**0.0000**	**2.2961**	**2.2961**	**6.0000e-005**	**0.0000**	**2.2975**

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	0.0700	0.6331	0.5560	8.9000e-004		0.0369	0.0369		0.0347	0.0347	0.0000	76.4313	76.4313	0.0187	0.0000	76.8975
Total	**0.0700**	**0.6331**	**0.5560**	**8.9000e-004**		**0.0369**	**0.0369**		**0.0347**	**0.0347**	**0.0000**	**76.4313**	**76.4313**	**0.0187**	**0.0000**	**76.8975**

3.6 Building Construction - 2020

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	9.3900e-003	0.2688	0.0691	6.4000e-004	0.0154	1.3700e-003	0.0168	4.4500e-003	1.3100e-003	5.7700e-003	0.0000	61.1177	61.1177	3.0000e-003	0.0000	61.1926
Worker	0.0356	0.0258	0.2669	8.2000e-004	0.0843	5.6000e-004	0.0848	0.0224	5.2000e-004	0.0229	0.0000	73.9348	73.9348	1.8200e-003	0.0000	73.9802
Total	**0.0450**	**0.2946**	**0.3360**	**1.4600e-003**	**0.0997**	**1.9300e-003**	**0.1016**	**0.0269**	**1.8300e-003**	**0.0287**	**0.0000**	**135.0525**	**135.0525**	**4.8200e-003**	**0.0000**	**135.1728**

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	0.0176	0.3601	0.5898	8.9000e-004		2.7900e-003	2.7900e-003		2.7900e-003	2.7900e-003	0.0000	76.4312	76.4312	0.0187	0.0000	76.8974
Total	**0.0176**	**0.3601**	**0.5898**	**8.9000e-004**		**2.7900e-003**	**2.7900e-003**		**2.7900e-003**	**2.7900e-003**	**0.0000**	**76.4312**	**76.4312**	**0.0187**	**0.0000**	**76.8974**

3.6 Building Construction - 2020

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	9.3900e-003	0.2688	0.0691	6.4000e-004	0.0154	1.3700e-003	0.0168	4.4500e-003	1.3100e-003	5.7700e-003	0.0000	61.1177	61.1177	3.0000e-003	0.0000	61.1926
Worker	0.0356	0.0258	0.2669	8.2000e-004	0.0843	5.6000e-004	0.0848	0.0224	5.2000e-004	0.0229	0.0000	73.9348	73.9348	1.8200e-003	0.0000	73.9802
Total	**0.0450**	**0.2946**	**0.3360**	**1.4600e-003**	**0.0997**	**1.9300e-003**	**0.1016**	**0.0269**	**1.8300e-003**	**0.0287**	**0.0000**	**135.0525**	**135.0525**	**4.8200e-003**	**0.0000**	**135.1728**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

3.6 Building Construction - 2021

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	0.0303	0.9577	0.2433	2.5000e-003	0.0609	2.1500e-003	0.0631	0.0176	2.0500e-003	0.0197	0.0000	239.5174	239.5174	0.0111	0.0000	239.7954
Worker	0.1302	0.0910	0.9623	3.1200e-003	0.3333	2.1700e-003	0.3354	0.0886	1.9900e-003	0.0906	0.0000	282.0130	282.0130	6.4100e-003	0.0000	282.1732
Total	**0.1605**	**1.0487**	**1.2056**	**5.6200e-003**	**0.3942**	**4.3200e-003**	**0.3985**	**0.1063**	**4.0400e-003**	**0.1103**	**0.0000**	**521.5304**	**521.5304**	**0.0175**	**0.0000**	**521.9686**

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	0.0696	1.4240	2.3325	3.5100e-003		0.0110	0.0110		0.0110	0.0110	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total	**0.0696**	**1.4240**	**2.3325**	**3.5100e-003**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

3.6 Building Construction - 2021

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	0.0303	0.9577	0.2433	2.5000e-003	0.0609	2.1500e-003	0.0631	0.0176	2.0500e-003	0.0197	0.0000	239.5174	239.5174	0.0111	0.0000	239.7954
Worker	0.1302	0.0910	0.9623	3.1200e-003	0.3333	2.1700e-003	0.3354	0.0886	1.9900e-003	0.0906	0.0000	282.0130	282.0130	6.4100e-003	0.0000	282.1732
Total	**0.1605**	**1.0487**	**1.2056**	**5.6200e-003**	**0.3942**	**4.3200e-003**	**0.3985**	**0.1063**	**4.0400e-003**	**0.1103**	**0.0000**	**521.5304**	**521.5304**	**0.0175**	**0.0000**	**521.9686**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0555	0.5075	0.5318	8.8000e-004		0.0263	0.0263		0.0247	0.0247	0.0000	75.3107	75.3107	0.0180	0.0000	75.7618
Total	**0.0555**	**0.5075**	**0.5318**	**8.8000e-004**		**0.0263**	**0.0263**		**0.0247**	**0.0247**	**0.0000**	**75.3107**	**75.3107**	**0.0180**	**0.0000**	**75.7618**

3.6 Building Construction - 2022

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	7.0400e-003	0.2253	0.0568	6.2000e-004	0.0152	4.6000e-004	0.0156	4.3900e-003	4.4000e-004	4.8300e-003	0.0000	59.0847	59.0847	2.6300e-003	0.0000	59.1504
Worker	0.0301	0.0203	0.2202	7.5000e-004	0.0830	5.3000e-004	0.0835	0.0221	4.9000e-004	0.0226	0.0000	67.6254	67.6254	1.4300e-003	0.0000	67.6612
Total	**0.0372**	**0.2456**	**0.2770**	**1.3700e-003**	**0.0982**	**9.9000e-004**	**0.0992**	**0.0265**	**9.3000e-004**	**0.0274**	**0.0000**	**126.7102**	**126.7102**	**4.0600e-003**	**0.0000**	**126.8116**

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	0.0173	0.3547	0.5809	8.8000e-004		2.7500e-003	2.7500e-003		2.7500e-003	2.7500e-003	0.0000	75.3106	75.3106	0.0180	0.0000	75.7617
Total	**0.0173**	**0.3547**	**0.5809**	**8.8000e-004**		**2.7500e-003**	**2.7500e-003**		**2.7500e-003**	**2.7500e-003**	**0.0000**	**75.3106**	**75.3106**	**0.0180**	**0.0000**	**75.7617**

3.6 Building Construction - 2022

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	7.0400e-003	0.2253	0.0568	6.2000e-004	0.0152	4.6000e-004	0.0156	4.3900e-003	4.4000e-004	4.8300e-003	0.0000	59.0847	59.0847	2.6300e-003	0.0000	59.1504
Worker	0.0301	0.0203	0.2202	7.5000e-004	0.0830	5.3000e-004	0.0835	0.0221	4.9000e-004	0.0226	0.0000	67.6254	67.6254	1.4300e-003	0.0000	67.6612
Total	**0.0372**	**0.2456**	**0.2770**	**1.3700e-003**	**0.0982**	**9.9000e-004**	**0.0992**	**0.0265**	**9.3000e-004**	**0.0274**	**0.0000**	**126.7102**	**126.7102**	**4.0600e-003**	**0.0000**	**126.8116**

3.7 Utilities 2 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4065	0.0000	0.4065	0.2234	0.0000	0.2234	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0875	0.9112	0.4760	8.6000e-004		0.0460	0.0460		0.0423	0.0423	0.0000	75.2304	75.2304	0.0243	0.0000	75.8386
Total	**0.0875**	**0.9112**	**0.4760**	**8.6000e-004**	**0.4065**	**0.0460**	**0.4525**	**0.2234**	**0.0423**	**0.2658**	**0.0000**	**75.2304**	**75.2304**	**0.0243**	**0.0000**	**75.8386**

3.7 Utilities 2 - 2021

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	1.2500e-003	8.8000e-004	9.2700e-003	3.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.7181	2.7181	6.0000e-005	0.0000	2.7196
Total	**1.2500e-003**	**8.8000e-004**	**9.2700e-003**	**3.0000e-005**	**3.2100e-003**	**2.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.7181**	**2.7181**	**6.0000e-005**	**0.0000**	**2.7196**

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					0.1829	0.0000	0.1829	0.0905	0.0000	0.0905	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0157	0.2736	0.5166	8.6000e-004		1.4000e-003	1.4000e-003		1.4000e-003	1.4000e-003	0.0000	75.2303	75.2303	0.0243	0.0000	75.8386
Total	**0.0157**	**0.2736**	**0.5166**	**8.6000e-004**	**0.1829**	**1.4000e-003**	**0.1843**	**0.0905**	**1.4000e-003**	**0.0919**	**0.0000**	**75.2303**	**75.2303**	**0.0243**	**0.0000**	**75.8386**

3.7 Utilities 2 - 2021

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	1.2500e-003	8.8000e-004	9.2700e-003	3.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.7181	2.7181	6.0000e-005	0.0000	2.7196
Total	**1.2500e-003**	**8.8000e-004**	**9.2700e-003**	**3.0000e-005**	**3.2100e-003**	**2.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.7181**	**2.7181**	**6.0000e-005**	**0.0000**	**2.7196**

3.8 Mass Grading 2 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2022	0.0000	0.2022	0.0820	0.0000	0.0820	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0943	1.0440	0.6948	1.4000e-003		0.0447	0.0447		0.0411	0.0411	0.0000	122.6137	122.6137	0.0397	0.0000	123.6051
Total	**0.0943**	**1.0440**	**0.6948**	**1.4000e-003**	**0.2022**	**0.0447**	**0.2469**	**0.0820**	**0.0411**	**0.1231**	**0.0000**	**122.6137**	**122.6137**	**0.0397**	**0.0000**	**123.6051**

3.8 Mass Grading 2 - 2021

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	0.0607	2.0917	0.4146	6.0600e-003	0.1324	6.6100e-003	0.1390	0.0364	6.3200e-003	0.0427	0.0000	585.0982	585.0982	0.0257	0.0000	585.7397
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	1.3900e-003	9.7000e-004	0.0103	3.0000e-005	3.5700e-003	2.0000e-005	3.5900e-003	9.5000e-004	2.0000e-005	9.7000e-004	0.0000	3.0201	3.0201	7.0000e-005	0.0000	3.0218
Total	**0.0621**	**2.0927**	**0.4249**	**6.0900e-003**	**0.1359**	**6.6300e-003**	**0.1426**	**0.0373**	**6.3400e-003**	**0.0437**	**0.0000**	**588.1183**	**588.1183**	**0.0257**	**0.0000**	**588.7615**

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					0.0910	0.0000	0.0910	0.0332	0.0000	0.0332	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.4336	0.8263	1.4000e-003		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003	0.0000	122.6136	122.6136	0.0397	0.0000	123.6050
Total	**0.0228**	**0.4336**	**0.8263**	**1.4000e-003**	**0.0910**	**2.2800e-003**	**0.0933**	**0.0332**	**2.2800e-003**	**0.0355**	**0.0000**	**122.6136**	**122.6136**	**0.0397**	**0.0000**	**123.6050**

3.8 Mass Grading 2 - 2021

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	0.0607	2.0917	0.4146	6.0600e-003	0.1324	6.6100e-003	0.1390	0.0364	6.3200e-003	0.0427	0.0000	585.0982	585.0982	0.0257	0.0000	585.7397
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	1.3900e-003	9.7000e-004	0.0103	3.0000e-005	3.5700e-003	2.0000e-005	3.5900e-003	9.5000e-004	2.0000e-005	9.7000e-004	0.0000	3.0201	3.0201	7.0000e-005	0.0000	3.0218
Total	**0.0621**	**2.0927**	**0.4249**	**6.0900e-003**	**0.1359**	**6.6300e-003**	**0.1426**	**0.0373**	**6.3400e-003**	**0.0437**	**0.0000**	**588.1183**	**588.1183**	**0.0257**	**0.0000**	**588.7615**

3.9 Paving 2 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0138	0.1421	0.1612	2.5000e-004		7.4500e-003	7.4500e-003		6.8600e-003	6.8600e-003	0.0000	22.0258	22.0258	7.1200e-003	0.0000	22.2039
Paving	6.6800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0205**	**0.1421**	**0.1612**	**2.5000e-004**		**7.4500e-003**	**7.4500e-003**		**6.8600e-003**	**6.8600e-003**	**0.0000**	**22.0258**	**22.0258**	**7.1200e-003**	**0.0000**	**22.2039**

3.9 Paving 2 - 2021

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	5.1000e-004	3.6000e-004	3.7800e-003	1.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.1074	1.1074	3.0000e-005	0.0000	1.1080
Total	**5.1000e-004**	**3.6000e-004**	**3.7800e-003**	**1.0000e-005**	**1.3100e-003**	**1.0000e-005**	**1.3200e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.1074**	**1.1074**	**3.0000e-005**	**0.0000**	**1.1080**

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	3.6700e-003	0.1104	0.1903	2.5000e-004		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	22.0258	22.0258	7.1200e-003	0.0000	22.2039
Paving	6.6800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.1104**	**0.1903**	**2.5000e-004**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**22.0258**	**22.0258**	**7.1200e-003**	**0.0000**	**22.2039**

3.9 Paving 2 - 2021

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	5.1000e-004	3.6000e-004	3.7800e-003	1.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.1074	1.1074	3.0000e-005	0.0000	1.1080
Total	**5.1000e-004**	**3.6000e-004**	**3.7800e-003**	**1.0000e-005**	**1.3100e-003**	**1.0000e-005**	**1.3200e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.1074**	**1.1074**	**3.0000e-005**	**0.0000**	**1.1080**

3.10 Exterior Finishes - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.4875					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.0761	0.0979	1.6000e-004		4.4100e-003	4.4100e-003		4.4100e-003	4.4100e-003	0.0000	13.7876	13.7876	9.0000e-004	0.0000	13.8100
Total	**2.4985**	**0.0761**	**0.0979**	**1.6000e-004**		**4.4100e-003**	**4.4100e-003**		**4.4100e-003**	**4.4100e-003**	**0.0000**	**13.7876**	**13.7876**	**9.0000e-004**	**0.0000**	**13.8100**

3.10 Exterior Finishes - 2022

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	9.9500e-003	6.7100e-003	0.0727	2.5000e-004	0.0274	1.7000e-004	0.0276	7.2900e-003	1.6000e-004	7.4500e-003	0.0000	22.3329	22.3329	4.7000e-004	0.0000	22.3447
Total	**9.9500e-003**	**6.7100e-003**	**0.0727**	**2.5000e-004**	**0.0274**	**1.7000e-004**	**0.0276**	**7.2900e-003**	**1.6000e-004**	**7.4500e-003**	**0.0000**	**22.3329**	**22.3329**	**4.7000e-004**	**0.0000**	**22.3447**

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	2.4875					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9400e-003	0.0572	0.0990	1.6000e-004		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	13.7876	13.7876	9.0000e-004	0.0000	13.8100
Total	**2.4904**	**0.0572**	**0.0990**	**1.6000e-004**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**13.7876**	**13.7876**	**9.0000e-004**	**0.0000**	**13.8100**

3.10 Exterior Finishes - 2022

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	9.9500e-003	6.7100e-003	0.0727	2.5000e-004	0.0274	1.7000e-004	0.0276	7.2900e-003	1.6000e-004	7.4500e-003	0.0000	22.3329	22.3329	4.7000e-004	0.0000	22.3447
Total	**9.9500e-003**	**6.7100e-003**	**0.0727**	**2.5000e-004**	**0.0274**	**1.7000e-004**	**0.0276**	**7.2900e-003**	**1.6000e-004**	**7.4500e-003**	**0.0000**	**22.3329**	**22.3329**	**4.7000e-004**	**0.0000**	**22.3447**

3.11 Landscaping - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3975	0.0000	0.3975	0.2185	0.0000	0.2185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0697	0.7278	0.4334	8.4000e-004		0.0355	0.0355		0.0326	0.0326	0.0000	73.5667	73.5667	0.0238	0.0000	74.1615
Total	**0.0697**	**0.7278**	**0.4334**	**8.4000e-004**	**0.3975**	**0.0355**	**0.4329**	**0.2185**	**0.0326**	**0.2511**	**0.0000**	**73.5667**	**73.5667**	**0.0238**	**0.0000**	**74.1615**

3.11 Landscaping - 2022

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	1.1400e-003	7.7000e-004	8.3300e-003	3.0000e-005	3.1400e-003	2.0000e-005	3.1600e-003	8.4000e-004	2.0000e-005	8.5000e-004	0.0000	2.5590	2.5590	5.0000e-005	0.0000	2.5603
Total	**1.1400e-003**	**7.7000e-004**	**8.3300e-003**	**3.0000e-005**	**3.1400e-003**	**2.0000e-005**	**3.1600e-003**	**8.4000e-004**	**2.0000e-005**	**8.5000e-004**	**0.0000**	**2.5590**	**2.5590**	**5.0000e-005**	**0.0000**	**2.5603**

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					0.1789	0.0000	0.1789	0.0885	0.0000	0.0885	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.2676	0.5051	8.4000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	73.5666	73.5666	0.0238	0.0000	74.1614
Total	**0.0153**	**0.2676**	**0.5051**	**8.4000e-004**	**0.1789**	**1.3700e-003**	**0.1802**	**0.0885**	**1.3700e-003**	**0.0899**	**0.0000**	**73.5666**	**73.5666**	**0.0238**	**0.0000**	**74.1614**

3.11 Landscaping - 2022

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	1.1400e-003	7.7000e-004	8.3300e-003	3.0000e-005	3.1400e-003	2.0000e-005	3.1600e-003	8.4000e-004	2.0000e-005	8.5000e-004	0.0000	2.5590	2.5590	5.0000e-005	0.0000	2.5603
Total	**1.1400e-003**	**7.7000e-004**	**8.3300e-003**	**3.0000e-005**	**3.1400e-003**	**2.0000e-005**	**3.1600e-003**	**8.4000e-004**	**2.0000e-005**	**8.5000e-004**	**0.0000**	**2.5590**	**2.5590**	**5.0000e-005**	**0.0000**	**2.5603**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5040	2.3149	5.6837	0.0199	1.7524	0.0169	1.7693	0.4702	0.0158	0.4860	0.0000	1,819.3529	1,819.3529	0.0656	0.0000	1,820.9920
Unmitigated	0.5040	2.3149	5.6837	0.0199	1.7524	0.0169	1.7693	0.4702	0.0158	0.4860	0.0000	1,819.3529	1,819.3529	0.0656	0.0000	1,820.9920

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,031.75	2,031.75	2031.75	4,692,545	4,692,545
Parking Lot	0.00	0.00	0.00		
Total	2,031.75	2,031.75	2,031.75	4,692,545	4,692,545

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.586711	0.038259	0.185486	0.120728	0.016377	0.005053	0.010699	0.024311	0.001622	0.001773	0.005406	0.002738	0.000835
Parking Lot	0.586711	0.038259	0.185486	0.120728	0.016377	0.005053	0.010699	0.024311	0.001622	0.001773	0.005406	0.002738	0.000835

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

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	201.6126	201.6126	9.1200e-003	1.8900e-003	202.4026
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	421.6040	421.6040	0.0191	3.9400e-003	423.2560
NaturalGas Mitigated	0.0143	0.1225	0.0521	7.8000e-004		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	141.8375	141.8375	2.7200e-003	2.6000e-003	142.6804
NaturalGas Unmitigated	0.0173	0.1480	0.0630	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.4386	171.4386	3.2900e-003	3.1400e-003	172.4574

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					
Apartments Low Rise	3.21264e+006	0.0173	0.1480	0.0630	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.4386	171.4386	3.2900e-003	3.1400e-003	172.4574
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0173**	**0.1480**	**0.0630**	**9.4000e-004**		**0.0120**	**0.0120**		**0.0120**	**0.0120**	**0.0000**	**171.4386**	**171.4386**	**3.2900e-003**	**3.1400e-003**	**172.4574**

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					
Apartments Low Rise	2.65793e+006	0.0143	0.1225	0.0521	7.8000e-004		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	141.8375	141.8375	2.7200e-003	2.6000e-003	142.6804
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0143**	**0.1225**	**0.0521**	**7.8000e-004**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**141.8375**	**141.8375**	**2.7200e-003**	**2.6000e-003**	**142.6804**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.36987e +006	398.5115	0.0180	3.7300e-003	400.0730
Parking Lot	79380	23.0926	1.0400e-003	2.2000e-004	23.1830
Total		**421.6040**	**0.0191**	**3.9500e-003**	**423.2560**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	653348	190.0664	8.5900e-003	1.7800e-003	190.8111
Parking Lot	39690	11.5463	5.2000e-004	1.1000e-004	11.5915
Total		**201.6127**	**9.1100e-003**	**1.8900e-003**	**202.4026**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4152	0.0438	3.3475	2.1200e-003		0.1560	0.1560		0.1560	0.1560	14.3608	9.7294	24.0901	0.0268	9.4000e-004	25.0406
Unmitigated	2.4152	0.0438	3.3475	2.1200e-003		0.1560	0.1560		0.1560	0.1560	14.3608	9.7294	24.0901	0.0268	9.4000e-004	25.0406

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	0.2488					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3685					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7268	0.0167	1.0008	1.9900e-003		0.1431	0.1431		0.1431	0.1431	14.3608	5.8987	20.2594	0.0231	9.4000e-004	21.1171
Landscaping	0.0712	0.0271	2.3467	1.2000e-004		0.0130	0.0130		0.0130	0.0130	0.0000	3.8307	3.8307	3.7100e-003	0.0000	3.9235
Total	**2.4152**	**0.0438**	**3.3475**	**2.1100e-003**		**0.1560**	**0.1560**		**0.1560**	**0.1560**	**14.3608**	**9.7294**	**24.0901**	**0.0268**	**9.4000e-004**	**25.0406**

6.2 Area by SubCategory

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	0.2488					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.3685					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7268	0.0167	1.0008	1.9900e-003		0.1431	0.1431		0.1431	0.1431	14.3608	5.8987	20.2594	0.0231	9.4000e-004	21.1171
Landscaping	0.0712	0.0271	2.3467	1.2000e-004		0.0130	0.0130		0.0130	0.0130	0.0000	3.8307	3.8307	3.7100e-003	0.0000	3.9235
Total	**2.4152**	**0.0438**	**3.3475**	**2.1100e-003**		**0.1560**	**0.1560**		**0.1560**	**0.1560**	**14.3608**	**9.7294**	**24.0901**	**0.0268**	**9.4000e-004**	**25.0406**

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

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	44.2283	0.5368	0.0130	61.5209
Unmitigated	51.9918	0.6708	0.0162	73.5946

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	20.5235 / 12.9387	51.9918	0.6708	0.0162	73.5946
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**51.9918**	**0.6708**	**0.0162**	**73.5946**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	16.4188 / 12.9387	44.2283	0.5368	0.0130	61.5209
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**44.2283**	**0.5368**	**0.0130**	**61.5209**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	29.4134	1.7383	0.0000	72.8704
Unmitigated	29.4134	1.7383	0.0000	72.8704

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	144.9	29.4134	1.7383	0.0000	72.8704
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**29.4134**	**1.7383**	**0.0000**	**72.8704**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	144.9	29.4134	1.7383	0.0000	72.8704
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**29.4134**	**1.7383**	**0.0000**	**72.8704**

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

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	495.6000	0.0000	0.0000	495.6000

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	700	495.6000	0.0000	0.0000	495.6000
Total		**495.6000**	**0.0000**	**0.0000**	**495.6000**

```
**
***************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.7.0
** Lakes Environmental Software Inc.
** Date: 9/20/2019
** File: C:\Lakes\AERMOD View\Lafayette_UNMIT_NEWSCHED\Lafayette_UNMIT_NEWSCHED.ADI
**
***************************************
**
**
***************************************
** AERMOD Control Pathway
***************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\Lafayette, PM10Exhaust\Lafayette, PM10Exhaust.i
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 26103
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL Lafayette_UNMIT_NEWSCHED.err
CO FINISHED
**
***************************************
** AERMOD Source Pathway
***************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   579275.330  4195314.870      102.400
** Source Parameters **
   SRCPARAM PAREA1         9.0E-08     3.000         4
   AREAVERT PAREA1       579275.330 4195314.870 579389.730 4195056.500
   AREAVERT PAREA1       579305.280 4194913.820 578994.760 4194833.910
   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED
**
***************************************
** AERMOD Receptor Pathway
***************************************
**
**
RE STARTING
```

```
   INCLUDED Lafayette_UNMIT_NEWSCHED.rou
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE "C:\Users\kheck\Desktop\MET Data\SF Airport\724940.SFC"
   PROFFILE "C:\Users\kheck\Desktop\MET Data\SF Airport\724940.PFL"
   SURFDATA 23234 2009 SAN_FRANCISCO/INT'L_ARPT
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 0.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL LAFAYETTE_UNMIT_NEWSCHED.AD\AN00GALL.PLT 31
   SUMMFILE Lafayette_UNMIT_NEWSCHED.sum
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        14:57:27

                                   PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                            ***     MODEL SETUP OPTIONS SUMMARY
  ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
```

```
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for     1 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =     26103.0 ;  Urban Roughness Length =  1.000 m

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Urban Roughness Length of 1.0 Meter Assumed.

 **Other Options Specified:
         CCVR_Sub - Meteorological data includes CCVR substitutions
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  PM_10

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:      1 Source(s);       1 Source Group(s); and     100
Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:      1 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with      0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing
Hours
```

```
                                                                  b for Both Calm
and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     0.00 ;  Decay
Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                               ;
Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.5 MB of RAM.

 **Input Runstream File:          aermod.inp

 **Output Print File:             aermod.out


 **Detailed Error/Message File:   Lafayette_UNMIT_NEWSCHED.err

 **File for Summary of Results:   Lafayette_UNMIT_NEWSCHED.sum

↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        14:57:27

                                   PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                *** AREAPOLY SOURCE DATA ***


               NUMBER EMISSION RATE   LOCATION OF AREA  BASE     RELEASE  NUMBER
  INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC       X        Y      ELEV.    HEIGHT  OF VERTS.
   SZ     SOURCE  SCALAR VARY
     ID         CATS.   /METER**2)   (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - -

 PAREA1           0   0.90000E-07  579275.3 4195314.9   102.4     3.00       4
   0.00     YES
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        14:57:27

                                   PAGE   3
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
```

*** SOURCE IDs DEFINING SOURCE GROUPS ***

```
 SRCGROUP ID                                                  SOURCE IDs
 -----------                                                  ----------

  ALL        PAREA1      ,
```


*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

```
  URBAN ID   URBAN POP                                        SOURCE IDs
  --------   ---------                                        ----------

                26103.   PAREA1      ,
```


*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
     ( 579376.8, 4195265.4,      96.5,     341.0,       0.0);         ( 579366.5, 4195290.1,      96.9,     341.0,       0.0);
     ( 579388.6, 4195362.4,      96.8,     341.0,       0.0);         ( 579394.4, 4195328.2,      96.5,     341.0,       0.0);
     ( 579420.7, 4195338.1,      95.8,     341.0,       0.0);         ( 579422.2, 4195332.1,      95.7,     341.0,       0.0);
     ( 579448.4, 4195352.7,      94.9,     341.0,       0.0);         ( 579475.9, 4195365.2,      94.9,     341.0,       0.0);
     ( 579383.1, 4195368.5,      97.0,     341.0,       0.0);         ( 579408.1, 4195379.2,      96.2,     341.0,       0.0);
     ( 579438.3, 4195396.2,      96.0,     341.0,       0.0);         ( 579477.8, 4195365.9,      94.9,     341.0,       0.0);
```

(579449.4, 4195351.4, 94.9, 341.0, 0.0); (579478.7, 4195365.5, 94.8, 341.0, 0.0);
(579479.2, 4195418.1, 96.5, 341.0, 0.0); (579534.5, 4195363.6, 93.9, 335.0, 0.0);
(579555.5, 4195347.4, 93.4, 335.0, 0.0); (579512.6, 4195313.3, 93.0, 335.0, 0.0);
(579554.8, 4195348.7, 93.4, 335.0, 0.0); (579554.6, 4195317.8, 92.6, 335.0, 0.0);
(579589.3, 4195341.0, 93.2, 335.0, 0.0); (579554.3, 4195316.3, 92.5, 335.0, 0.0);
(579559.8, 4195303.1, 92.0, 335.0, 0.0); (579526.0, 4195263.7, 91.6, 335.0, 0.0);
(579559.8, 4195303.1, 92.0, 335.0, 0.0); (579564.4, 4195276.9, 91.0, 335.0, 0.0);
(579566.5, 4195251.2, 90.9, 335.0, 0.0); (579622.4, 4195265.0, 90.6, 335.0, 0.0);
(579573.5, 4195248.8, 90.7, 335.0, 0.0); (579513.6, 4195237.8, 91.0, 335.0, 0.0);
(579472.3, 4195224.9, 91.1, 341.0, 0.0); (579436.4, 4195155.2, 92.0, 341.0, 0.0);
(579478.6, 4195183.9, 91.0, 335.0, 0.0); (579514.0, 4195198.3, 90.8, 335.0, 0.0);
(579543.5, 4195198.3, 90.3, 335.0, 0.0); (579571.9, 4195210.4, 90.0, 335.0, 0.0);
(579595.7, 4195214.3, 90.0, 335.0, 0.0); (579628.1, 4195222.0, 90.0, 325.0, 0.0);
(579447.4, 4195129.9, 90.9, 341.0, 0.0); (579490.8, 4195149.1, 90.3, 335.0, 0.0);
(579536.1, 4195154.2, 89.9, 335.0, 0.0); (579599.6, 4195156.9, 89.0, 335.0, 0.0);
(579535.1, 4195154.5, 89.9, 335.0, 0.0); (579427.5, 4195281.2, 94.7, 341.0, 0.0);
(579455.3, 4195308.1, 94.6, 341.0, 0.0); (579625.1, 4195224.4, 90.0, 335.0, 0.0);
(579597.6, 4195215.3, 90.0, 335.0, 0.0); (579541.9, 4195198.5, 90.3, 335.0, 0.0);
(579510.0, 4195191.3, 90.8, 335.0, 0.0); (579473.0, 4195182.5, 91.0, 341.0, 0.0);
(579433.8, 4195157.5, 92.4, 341.0, 0.0); (579439.3, 4195127.9, 91.5, 341.0, 0.0);
(579491.0, 4195150.0, 90.3, 335.0, 0.0); (579532.9, 4195156.6, 90.0, 335.0, 0.0);
(579587.6, 4195162.3, 89.2, 335.0, 0.0); (579453.2, 4195091.2, 90.7, 335.0, 0.0);
(579489.1, 4195111.6, 90.0, 335.0, 0.0); (579500.3, 4195086.1, 89.7, 335.0, 0.0);
(579540.2, 4195117.6, 89.0, 335.0, 0.0); (579578.0, 4195114.7, 89.0, 335.0, 0.0);
(579623.2, 4195112.0, 88.0, 325.0, 0.0); (579661.8, 4195112.1, 87.5, 325.0, 0.0);

```
     ( 579670.0, 4195083.6,      87.0,     325.0,       0.0);         ( 579641.6,
4195079.2,      87.2,     325.0,       0.0);
     ( 579631.9, 4195115.7,      87.9,     325.0,       0.0);         ( 579600.7,
4195084.0,      88.4,     325.0,       0.0);
     ( 579574.7, 4195079.2,      88.4,     335.0,       0.0);         ( 579546.3,
4195073.3,      88.7,     335.0,       0.0);
     ( 579499.2, 4195082.3,      89.7,     335.0,       0.0);         ( 579499.8,
4195040.2,      90.0,     335.0,       0.0);
     ( 579565.5, 4195039.9,      88.0,     335.0,       0.0);         ( 579608.1,
4195035.4,      87.0,     325.0,       0.0);
     ( 579608.1, 4195006.7,      86.0,     325.0,       0.0);         ( 579626.0,
4194979.8,      85.0,     325.0,       0.0);
     ( 579654.5, 4194983.4,      84.3,     325.0,       0.0);         ( 579649.1,
4195020.7,      86.0,     325.0,       0.0);
     ( 579680.2, 4195014.7,      86.2,     325.0,       0.0);         ( 579686.9,
4194989.5,      85.5,     325.0,       0.0);
     ( 579695.1, 4194962.2,      84.9,     325.0,       0.0);         ( 579415.7,
4194658.5,      81.8,     325.0,       0.0);
     ( 579171.4, 4194613.6,     104.2,     325.0,       0.0);         ( 579201.4,
4194587.0,     101.2,     325.0,       0.0);
     ( 579144.6, 4194511.7,     122.4,     325.0,       0.0);         ( 579118.0,
4194598.5,     112.3,     325.0,       0.0);
     ( 579097.1, 4194585.0,     113.1,     325.0,       0.0);         ( 579079.5,
4194579.6,     113.6,     325.0,       0.0);
     ( 579054.6, 4194572.9,     113.7,     325.0,       0.0);         ( 579042.0,
4194550.6,     117.1,     325.0,       0.0);
     ( 579024.5, 4194544.0,     116.8,     325.0,       0.0);         ( 578981.9,
4194572.9,     108.8,     335.0,       0.0);
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        14:57:27

                                   PAGE   6
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                             *** DISCRETE CARTESIAN RECEPTORS ***
                                           (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
                                                           (METERS)

     ( 578875.7, 4194520.8,      92.7,     341.0,       0.0);         ( 578876.6,
4194497.0,      90.6,     341.0,       0.0);
     ( 578880.4, 4194470.3,      89.0,     341.0,       0.0);         ( 578919.5,
4194533.1,     101.2,     335.0,       0.0);
     ( 578916.7, 4194498.3,      98.2,     341.0,       0.0);         ( 578927.0,
4194465.2,      96.4,     335.0,       0.0);
     ( 579339.7, 4195512.0,     100.4,     341.0,       0.0);         ( 578544.1,
4194771.5,     102.0,     343.0,       0.0);
     ( 578515.8, 4194768.6,     106.6,     343.0,       0.0);         ( 578933.5,
4194936.4,     132.7,     335.0,       0.0);
```

↑ *** AERMOD - VERSION 18081 ***   *** C:\Lakes\AERMOD View\Lafayette, PM10Exhaust\Lafayette, PM10Exhaust.i ***   09/20/19
*** AERMET - VERSION 14134 ***   ***
***   14:57:27

PAGE   7
*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1
1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23,
10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

```
   Surface file:   C:\Users\kheck\Desktop\MET Data\SF Airport\724940.SFC
                 Met Version:  14134
   Profile file:   C:\Users\kheck\Desktop\MET Data\SF Airport\724940.PFL

   Surface format: FREE

   Profile format: FREE

   Surface station no.:    23234                  Upper air station no.:    23230
                 Name: SAN_FRANCISCO/INT'L_ARPT                  Name:
OAKLAND/WSO_AP
                 Year:   2009                                   Year:   2009

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN
ALBEDO  REF WS   WD     HT  REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
 09 01 01   1 01  -28.0  0.491 -9.000 -9.000 -999.  826.    386.1  0.49   0.45
1.00    3.86   71.   10.0  282.5    2.0
 09 01 01   1 02  -15.7  0.275 -9.000 -9.000 -999.  390.    121.4  0.49   0.45
1.00    2.36   78.   10.0  282.5    2.0
 09 01 01   1 03  -24.0  0.421 -9.000 -9.000 -999.  656.    284.0  0.49   0.45
1.00    3.36   94.   10.0  282.5    2.0
 09 01 01   1 04  -20.7  0.364 -9.000 -9.000 -999.  529.    211.5  0.32   0.45
1.00    3.36   43.   10.0  282.0    2.0
 09 01 01   1 05  -17.2  0.301 -9.000 -9.000 -999.  398.    144.1  0.32   0.45
1.00    2.86   13.   10.0  281.4    2.0
 09 01 01   1 06  -27.0  0.472 -9.000 -9.000 -999.  779.    355.0  0.44   0.45
1.00    3.86  352.   10.0  280.9    2.0
 09 01 01   1 07  -27.9  0.486 -9.000 -9.000 -999.  812.    374.7  0.32   0.45
1.00    4.36   15.   10.0  280.4    2.0
 09 01 01   1 08  -20.9  0.364 -9.000 -9.000 -999.  538.    209.6  0.32   0.45
1.00    3.36   13.   10.0  279.9    2.0
 09 01 01   1 09   -8.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
0.38    0.00    0.   10.0  280.4    2.0
 09 01 01   1 10    4.9  0.280  0.224  0.016   83.  355.   -405.2  0.32   0.45
0.25    2.36   21.   10.0  280.9    2.0
 09 01 01   1 11   10.7 -9.000 -9.000 -9.000  147. -999. -99999.0  0.51   0.45
0.20    0.00    0.   10.0  280.4    2.0
 09 01 01   1 12   14.1  0.289  0.429  0.016  203.  373.   -156.0  0.32   0.45
0.19    2.36   26.   10.0  280.9    2.0
 09 01 01   1 13   14.7 -9.000 -9.000 -9.000  247. -999. -99999.0  0.51   0.45
0.18    0.00    0.   10.0  280.9    2.0
 09 01 01   1 14   61.1 -9.000 -9.000 -9.000  379. -999. -99999.0  0.51   0.45
0.19    0.00    0.   10.0  282.0    2.0
 09 01 01   1 15   43.2  0.307  0.805  0.017  439.  408.    -60.8  0.32   0.45
0.22    2.36   22.   10.0  282.5    2.0
 09 01 01   1 16   17.1  0.345  0.594  0.015  445.  487.   -219.0  0.32   0.45
0.30    2.86   14.   10.0  282.5    2.0
```

```
 09 01 01   1 17   -7.0  0.102 -9.000 -9.000 -999.  169.     13.7  0.32   0.45
0.54    1.76   31.   10.0  282.5    2.0
 09 01 01   1 18   -9.9  0.112 -9.000 -9.000 -999.   91.     13.0  0.44   0.45
1.00    1.76  357.   10.0  282.0    2.0
 09 01 01   1 19  -18.1  0.159 -9.000 -9.000 -999.  152.     20.2  0.32   0.45
1.00    2.36    4.   10.0  282.0    2.0
 09 01 01   1 20 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 21 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  282.0    2.0
 09 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  282.0    2.0
 09 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 24   -9.9  0.173 -9.000 -9.000 -999.  173.     47.9  0.49   0.45
1.00    1.76  100.   10.0  281.4    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 09 01 01 01   10.0 1   71.    3.86   282.6   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                       ***        14:57:27

                                   PAGE   9
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                    **

       X-COORD (M)   Y-COORD (M)        CONC                        X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -
         579376.79    4195265.37        0.08424                        579366.50
4195290.12        0.07243
         579388.61    4195362.37        0.03602                        579394.44
4195328.16        0.04533
         579420.71    4195338.11        0.03828                        579422.17
```

4195332.14 0.03962
579448.41 4195352.68 0.03193 579475.89
4195365.23 0.02761
579383.10 4195368.53 0.03506 579408.11
4195379.24 0.03064
579438.30 4195396.25 0.02598 579477.79
4195365.90 0.02737
579449.41 4195351.37 0.03207 579478.73
4195365.51 0.02734
579479.19 4195418.14 0.02148 579534.50
4195363.61 0.02366
579555.54 4195347.36 0.02393 579512.59
4195313.28 0.03181
579554.78 4195348.72 0.02384 579554.61
4195317.76 0.02719
579589.31 4195340.96 0.02239 579554.34
4195316.30 0.02739
579559.84 4195303.10 0.02846 579525.99
4195263.67 0.03825
579559.84 4195303.10 0.02846 579564.36
4195276.88 0.03126
579566.46 4195251.21 0.03457 579622.43
4195265.05 0.02709
579573.50 4195248.79 0.03400 579513.56
4195237.83 0.04528
579472.32 4195224.94 0.05868 579436.40
4195155.20 0.10424
579478.64 4195183.88 0.06906 579514.02
4195198.32 0.05383
579543.48 4195198.32 0.04681 579571.94
4195210.43 0.03962
579595.65 4195214.35 0.03566 579628.05
4195221.97 0.03097
579447.35 4195129.93 0.10578 579490.84
4195149.08 0.07369
579536.08 4195154.24 0.05662 579599.61
4195156.89 0.04209
579535.07 4195154.47 0.05687 579427.54
4195281.16 0.05436
579455.30 4195308.08 0.04055 579625.13
4195224.37 0.03102
579597.64 4195215.33 0.03528 579541.92
4195198.50 0.04711
579509.98 4195191.30 0.05655 579473.03
4195182.53 0.07177
579433.77 4195157.54 0.10559 579439.29
4195127.94 0.11403
579491.04 4195150.05 0.07335 579532.90
4195156.57 0.05713
579587.63 4195162.32 0.04357 579453.17

4195091.25   0.11419
579489.13   4195111.64   0.08357   579500.28
4195086.06   0.08219
579540.25   4195117.64   0.06116   579577.99
4195114.72   0.05134
579623.15   4195111.99   0.04239   579661.76
4195112.06   0.03652
579669.97   4195083.60   0.03700   579641.56
4195079.20   0.04139
579631.93   4195115.66   0.04063   579600.67
4195083.95   0.04887
579574.71   4195079.16   0.05529   579546.34
4195073.35   0.06408
579499.21   4195082.27   0.08321   579499.80
4195040.24   0.08573
579565.47   4195039.92   0.05947   579608.11
4195035.38   0.04903
579608.12   4195006.71   0.04879   579625.95
4194979.77   0.04465
579654.52   4194983.36   0.04026   579649.11
4195020.72   0.04172
579680.24   4195014.73   0.03740   579686.87
4194989.46   0.03638
579695.08   4194962.20   0.03487   579415.74
4194658.45   0.01462

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** THE ANNUAL AVERAGE CONCENTRATION   VALUES AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL   ***
INCLUDING SOURCE(S):   PAREA1   ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10   IN MICROGRAMS/M**3 **

X-COORD (M)   Y-COORD (M)   CONC   X-COORD (M)
Y-COORD (M)   CONC
- -
579171.37   4194613.65   0.00943   579201.36
4194587.03   0.00825
579144.58   4194511.73   0.00455   579118.00

4194598.46 0.00776
579097.07 4194584.95 0.00725 579079.46
4194579.64 0.00703
579054.64 4194572.92 0.00676 579041.98
4194550.60 0.00585
579024.54 4194543.97 0.00564 578981.86
4194572.89 0.00640
578875.71 4194520.79 0.00425 578876.60
4194496.98 0.00400
578880.42 4194470.26 0.00378 578919.48
4194533.14 0.00504
578916.70 4194498.30 0.00454 578927.03
4194465.24 0.00424
579339.74 4195512.02 0.01803 578544.14
4194771.46 0.00212
578515.83 4194768.61 0.00196 578933.53
4194936.41 0.00936

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

NETWORK
GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID
- -

ALL 1ST HIGHEST VALUE IS 0.11419 AT (579453.17, 4195091.25, 90.74, 335.00, 0.00) DC
2ND HIGHEST VALUE IS 0.11403 AT (579439.29, 4195127.94, 91.45, 341.00, 0.00) DC
3RD HIGHEST VALUE IS 0.10578 AT (579447.35, 4195129.93, 90.89, 341.00, 0.00) DC
4TH HIGHEST VALUE IS 0.10559 AT (579433.77, 4195157.54, 92.37, 341.00, 0.00) DC
5TH HIGHEST VALUE IS 0.10424 AT (579436.40, 4195155.20, 91.97, 341.00, 0.00) DC
6TH HIGHEST VALUE IS 0.08573 AT (579499.80, 4195040.24,

```
90.01,   335.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.08424 AT (  579376.79,  4195265.37,
96.54,   341.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.08357 AT (  579489.13,  4195111.64,
90.00,   335.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.08321 AT (  579499.21,  4195082.27,
89.68,   335.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.08219 AT (  579500.28,  4195086.06,
89.74,   335.00,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of         6306 Informational Message(s)

 A Total of        43872 Hours Were Processed

 A Total of         5804 Calm Hours Identified

 A Total of          502 Missing Hours Identified (  1.14 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 MX W481   43873         MAIN: Data Remaining After End of Year. Number of Hours=
       48

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.7.0
** Lakes Environmental Software Inc.
** Date: 9/20/2019
** File: C:\Lakes\AERMOD View\Lafayette_MIT_New Schedule_Tier 4I\Lafayette_MIT_New
Schedule_Tier 4I.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\Lafayette, PM10Exhaust\Lafayette, PM10Exhaust.i
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 26103
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL "Lafayette_MIT_New Schedule_Tier 4I.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   579275.330  4195314.870      102.400
** Source Parameters **
   SRCPARAM PAREA1         9.8E-09     3.000         4
   AREAVERT PAREA1       579275.330 4195314.870 579389.730 4195056.500
   AREAVERT PAREA1       579305.280 4194913.820 578994.760 4194833.910
   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
```

```
RE STARTING
   INCLUDED "Lafayette_MIT_New Schedule_Tier 4I.rou"
RE FINISHED
**
***************************************
** AERMOD Meteorology Pathway
***************************************
**
**
ME STARTING
   SURFFILE "C:\Users\kheck\Desktop\MET Data\SF Airport\724940.SFC"
   PROFFILE "C:\Users\kheck\Desktop\MET Data\SF Airport\724940.PFL"
   SURFDATA 23234 2009 SAN_FRANCISCO/INT'L_ARPT
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 0.0 METERS
ME FINISHED
**
***************************************
** AERMOD Output Pathway
***************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "LAFAYETTE_MIT_NEW SCHEDULE_TIER 4I.AD\AN00GALL.PLT" 31
   SUMMFILE "Lafayette_MIT_New Schedule_Tier 4I.sum"
OU FINISHED

 **********************************
 *** SETUP Finishes Successfully ***
 **********************************

↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        15:05:53

                                   PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                            ***     MODEL SETUP OPTIONS SUMMARY
  ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
```

```
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for     1 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =     26103.0 ;  Urban Roughness Length =  1.000 m

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Urban Roughness Length of 1.0 Meter Assumed.

 **Other Options Specified:
         CCVR_Sub - Meteorological data includes CCVR substitutions
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  PM_10

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:      1 Source(s);       1 Source Group(s); and     100
Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:      1 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with      0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing
```

```
Hours
                                                                  b for Both Calm
and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     0.00 ;  Decay
Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                ;
Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.5 MB of RAM.

 **Input Runstream File:          aermod.inp

 **Output Print File:             aermod.out


 **Detailed Error/Message File:   Lafayette_MIT_New Schedule_Tier 4I.err

 **File for Summary of Results:   Lafayette_MIT_New Schedule_Tier 4I.sum

↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        15:05:53

                                   PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                *** AREAPOLY SOURCE DATA ***

               NUMBER EMISSION RATE   LOCATION OF AREA  BASE     RELEASE  NUMBER
  INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC       X         Y      ELEV.    HEIGHT  OF VERTS.
   SZ      SOURCE  SCALAR VARY
     ID         CATS.   /METER**2)   (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - -

 PAREA1           0   0.98000E-08  579275.3 4195314.9   102.4     3.00       4
   0.00     YES
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        15:05:53

                                   PAGE   3
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
```

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID   SOURCE IDs
-----------   ----------

ALL   PAREA1   ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID   URBAN POP   SOURCE IDs
--------   ---------   ----------

26103.   PAREA1   ,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(579376.8, 4195265.4,   96.5,   341.0,   0.0);   (579366.5, 4195290.1,   96.9,   341.0,   0.0);
(579388.6, 4195362.4,   96.8,   341.0,   0.0);   (579394.4, 4195328.2,   96.5,   341.0,   0.0);
(579420.7, 4195338.1,   95.8,   341.0,   0.0);   (579422.2, 4195332.1,   95.7,   341.0,   0.0);
(579448.4, 4195352.7,   94.9,   341.0,   0.0);   (579475.9, 4195365.2,   94.9,   341.0,   0.0);
(579383.1, 4195368.5,   97.0,   341.0,   0.0);   (579408.1, 4195379.2,   96.2,   341.0,   0.0);
(579438.3, 4195396.2,   96.0,   341.0,   0.0);   (579477.8,

```
4195365.9,      94.9,     341.0,         0.0);
     ( 579449.4, 4195351.4,      94.9,     341.0,         0.0);           ( 579478.7,
4195365.5,      94.8,     341.0,         0.0);
     ( 579479.2, 4195418.1,      96.5,     341.0,         0.0);           ( 579534.5,
4195363.6,      93.9,     335.0,         0.0);
     ( 579555.5, 4195347.4,      93.4,     335.0,         0.0);           ( 579512.6,
4195313.3,      93.0,     335.0,         0.0);
     ( 579554.8, 4195348.7,      93.4,     335.0,         0.0);           ( 579554.6,
4195317.8,      92.6,     335.0,         0.0);
     ( 579589.3, 4195341.0,      93.2,     335.0,         0.0);           ( 579554.3,
4195316.3,      92.5,     335.0,         0.0);
     ( 579559.8, 4195303.1,      92.0,     335.0,         0.0);           ( 579526.0,
4195263.7,      91.6,     335.0,         0.0);
     ( 579559.8, 4195303.1,      92.0,     335.0,         0.0);           ( 579564.4,
4195276.9,      91.0,     335.0,         0.0);
     ( 579566.5, 4195251.2,      90.9,     335.0,         0.0);           ( 579622.4,
4195265.0,      90.6,     335.0,         0.0);
     ( 579573.5, 4195248.8,      90.7,     335.0,         0.0);           ( 579513.6,
4195237.8,      91.0,     335.0,         0.0);
     ( 579472.3, 4195224.9,      91.1,     341.0,         0.0);           ( 579436.4,
4195155.2,      92.0,     341.0,         0.0);
     ( 579478.6, 4195183.9,      91.0,     335.0,         0.0);           ( 579514.0,
4195198.3,      90.8,     335.0,         0.0);
     ( 579543.5, 4195198.3,      90.3,     335.0,         0.0);           ( 579571.9,
4195210.4,      90.0,     335.0,         0.0);
     ( 579595.7, 4195214.3,      90.0,     335.0,         0.0);           ( 579628.1,
4195222.0,      90.0,     325.0,         0.0);
     ( 579447.4, 4195129.9,      90.9,     341.0,         0.0);           ( 579490.8,
4195149.1,      90.3,     335.0,         0.0);
     ( 579536.1, 4195154.2,      89.9,     335.0,         0.0);           ( 579599.6,
4195156.9,      89.0,     335.0,         0.0);
     ( 579535.1, 4195154.5,      89.9,     335.0,         0.0);           ( 579427.5,
4195281.2,      94.7,     341.0,         0.0);
     ( 579455.3, 4195308.1,      94.6,     341.0,         0.0);           ( 579625.1,
4195224.4,      90.0,     335.0,         0.0);
     ( 579597.6, 4195215.3,      90.0,     335.0,         0.0);           ( 579541.9,
4195198.5,      90.3,     335.0,         0.0);
     ( 579510.0, 4195191.3,      90.8,     335.0,         0.0);           ( 579473.0,
4195182.5,      91.0,     341.0,         0.0);
     ( 579433.8, 4195157.5,      92.4,     341.0,         0.0);           ( 579439.3,
4195127.9,      91.5,     341.0,         0.0);
     ( 579491.0, 4195150.0,      90.3,     335.0,         0.0);           ( 579532.9,
4195156.6,      90.0,     335.0,         0.0);
     ( 579587.6, 4195162.3,      89.2,     335.0,         0.0);           ( 579453.2,
4195091.2,      90.7,     335.0,         0.0);
     ( 579489.1, 4195111.6,      90.0,     335.0,         0.0);           ( 579500.3,
4195086.1,      89.7,     335.0,         0.0);
     ( 579540.2, 4195117.6,      89.0,     335.0,         0.0);           ( 579578.0,
4195114.7,      89.0,     335.0,         0.0);
     ( 579623.2, 4195112.0,      88.0,     325.0,         0.0);           ( 579661.8,
```

```
4195112.1,      87.5,     325.0,       0.0);
     ( 579670.0, 4195083.6,      87.0,     325.0,       0.0);          ( 579641.6,
4195079.2,      87.2,     325.0,       0.0);
     ( 579631.9, 4195115.7,      87.9,     325.0,       0.0);          ( 579600.7,
4195084.0,      88.4,     325.0,       0.0);
     ( 579574.7, 4195079.2,      88.4,     335.0,       0.0);          ( 579546.3,
4195073.3,      88.7,     335.0,       0.0);
     ( 579499.2, 4195082.3,      89.7,     335.0,       0.0);          ( 579499.8,
4195040.2,      90.0,     335.0,       0.0);
     ( 579565.5, 4195039.9,      88.0,     335.0,       0.0);          ( 579608.1,
4195035.4,      87.0,     325.0,       0.0);
     ( 579608.1, 4195006.7,      86.0,     325.0,       0.0);          ( 579626.0,
4194979.8,      85.0,     325.0,       0.0);
     ( 579654.5, 4194983.4,      84.3,     325.0,       0.0);          ( 579649.1,
4195020.7,      86.0,     325.0,       0.0);
     ( 579680.2, 4195014.7,      86.2,     325.0,       0.0);          ( 579686.9,
4194989.5,      85.5,     325.0,       0.0);
     ( 579695.1, 4194962.2,      84.9,     325.0,       0.0);          ( 579415.7,
4194658.5,      81.8,     325.0,       0.0);
     ( 579171.4, 4194613.6,     104.2,     325.0,       0.0);          ( 579201.4,
4194587.0,     101.2,     325.0,       0.0);
     ( 579144.6, 4194511.7,     122.4,     325.0,       0.0);          ( 579118.0,
4194598.5,     112.3,     325.0,       0.0);
     ( 579097.1, 4194585.0,     113.1,     325.0,       0.0);          ( 579079.5,
4194579.6,     113.6,     325.0,       0.0);
     ( 579054.6, 4194572.9,     113.7,     325.0,       0.0);          ( 579042.0,
4194550.6,     117.1,     325.0,       0.0);
     ( 579024.5, 4194544.0,     116.8,     325.0,       0.0);          ( 578981.9,
4194572.9,     108.8,     335.0,       0.0);
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                                    *** DISCRETE CARTESIAN RECEPTORS ***
                                                  (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
                                                                  (METERS)

     ( 578875.7, 4194520.8,      92.7,     341.0,       0.0);          ( 578876.6,
4194497.0,      90.6,     341.0,       0.0);
     ( 578880.4, 4194470.3,      89.0,     341.0,       0.0);          ( 578919.5,
4194533.1,     101.2,     335.0,       0.0);
     ( 578916.7, 4194498.3,      98.2,     341.0,       0.0);          ( 578927.0,
4194465.2,      96.4,     335.0,       0.0);
     ( 579339.7, 4195512.0,     100.4,     341.0,       0.0);          ( 578544.1,
4194771.5,     102.0,     343.0,       0.0);
     ( 578515.8, 4194768.6,     106.6,     343.0,       0.0);          ( 578933.5,
```

4194936.4, 132.7, 335.0, 0.0);

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

```
   Surface file:   C:\Users\kheck\Desktop\MET Data\SF Airport\724940.SFC
                  Met Version:  14134
   Profile file:   C:\Users\kheck\Desktop\MET Data\SF Airport\724940.PFL

   Surface format: FREE

   Profile format: FREE

   Surface station no.:    23234                  Upper air station no.:    23230
                  Name: SAN_FRANCISCO/INT'L_ARPT                  Name:
OAKLAND/WSO_AP
                  Year:   2009                                  Year:   2009

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN
ALBEDO  REF WS   WD     HT  REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
 09 01 01   1 01  -28.0  0.491 -9.000 -9.000 -999.  826.    386.1  0.49   0.45
1.00    3.86   71.   10.0  282.5    2.0
 09 01 01   1 02  -15.7  0.275 -9.000 -9.000 -999.  390.    121.4  0.49   0.45
1.00    2.36   78.   10.0  282.5    2.0
 09 01 01   1 03  -24.0  0.421 -9.000 -9.000 -999.  656.    284.0  0.49   0.45
1.00    3.36   94.   10.0  282.5    2.0
 09 01 01   1 04  -20.7  0.364 -9.000 -9.000 -999.  529.    211.5  0.32   0.45
1.00    3.36   43.   10.0  282.0    2.0
 09 01 01   1 05  -17.2  0.301 -9.000 -9.000 -999.  398.    144.1  0.32   0.45
1.00    2.86   13.   10.0  281.4    2.0
 09 01 01   1 06  -27.0  0.472 -9.000 -9.000 -999.  779.    355.0  0.44   0.45
1.00    3.86  352.   10.0  280.9    2.0
 09 01 01   1 07  -27.9  0.486 -9.000 -9.000 -999.  812.    374.7  0.32   0.45
1.00    4.36   15.   10.0  280.4    2.0
 09 01 01   1 08  -20.9  0.364 -9.000 -9.000 -999.  538.    209.6  0.32   0.45
1.00    3.36   13.   10.0  279.9    2.0
 09 01 01   1 09   -8.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
0.38    0.00    0.   10.0  280.4    2.0
 09 01 01   1 10    4.9  0.280  0.224  0.016   83.  355.   -405.2  0.32   0.45
0.25    2.36   21.   10.0  280.9    2.0
 09 01 01   1 11   10.7 -9.000 -9.000 -9.000  147. -999. -99999.0  0.51   0.45
0.20    0.00    0.   10.0  280.4    2.0
 09 01 01   1 12   14.1  0.289  0.429  0.016  203.  373.   -156.0  0.32   0.45
0.19    2.36   26.   10.0  280.9    2.0
 09 01 01   1 13   14.7 -9.000 -9.000 -9.000  247. -999. -99999.0  0.51   0.45
0.18    0.00    0.   10.0  280.9    2.0
 09 01 01   1 14   61.1 -9.000 -9.000 -9.000  379. -999. -99999.0  0.51   0.45
0.19    0.00    0.   10.0  282.0    2.0
 09 01 01   1 15   43.2  0.307  0.805  0.017  439.  408.    -60.8  0.32   0.45
0.22    2.36   22.   10.0  282.5    2.0
 09 01 01   1 16   17.1  0.345  0.594  0.015  445.  487.   -219.0  0.32   0.45
```

```
0.30    2.86   14.   10.0  282.5    2.0
 09 01 01   1 17   -7.0  0.102 -9.000 -9.000 -999.  169.     13.7  0.32   0.45
0.54    1.76   31.   10.0  282.5    2.0
 09 01 01   1 18   -9.9  0.112 -9.000 -9.000 -999.   91.     13.0  0.44   0.45
1.00    1.76  357.   10.0  282.0    2.0
 09 01 01   1 19  -18.1  0.159 -9.000 -9.000 -999.  152.     20.2  0.32   0.45
1.00    2.36    4.   10.0  282.0    2.0
 09 01 01   1 20 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 21 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  282.0    2.0
 09 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  282.0    2.0
 09 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.51   0.45
1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 24   -9.9  0.173 -9.000 -9.000 -999.  173.     47.9  0.49   0.45
1.00    1.76  100.   10.0  281.4    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 09 01 01 01   10.0 1   71.    3.86   282.6   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS ***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3                   **

       X-COORD (M)   Y-COORD (M)        CONC                        X-COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         579376.79    4195265.37        0.00917                       579366.50    4195290.12        0.00789
         579388.61    4195362.37        0.00392                       579394.44    4195328.16        0.00494
```

579420.71	4195338.11	0.00417	579422.17	4195332.14	0.00431
579448.41	4195352.68	0.00348	579475.89	4195365.23	0.00301
579383.10	4195368.53	0.00382	579408.11	4195379.24	0.00334
579438.30	4195396.25	0.00283	579477.79	4195365.90	0.00298
579449.41	4195351.37	0.00349	579478.73	4195365.51	0.00298
579479.19	4195418.14	0.00234	579534.50	4195363.61	0.00258
579555.54	4195347.36	0.00261	579512.59	4195313.28	0.00346
579554.78	4195348.72	0.00260	579554.61	4195317.76	0.00296
579589.31	4195340.96	0.00244	579554.34	4195316.30	0.00298
579559.84	4195303.10	0.00310	579525.99	4195263.67	0.00416
579559.84	4195303.10	0.00310	579564.36	4195276.88	0.00340
579566.46	4195251.21	0.00376	579622.43	4195265.05	0.00295
579573.50	4195248.79	0.00370	579513.56	4195237.83	0.00493
579472.32	4195224.94	0.00639	579436.40	4195155.20	0.01135
579478.64	4195183.88	0.00752	579514.02	4195198.32	0.00586
579543.48	4195198.32	0.00510	579571.94	4195210.43	0.00431
579595.65	4195214.35	0.00388	579628.05	4195221.97	0.00337
579447.35	4195129.93	0.01152	579490.84	4195149.08	0.00802
579536.08	4195154.24	0.00617	579599.61	4195156.89	0.00458
579535.07	4195154.47	0.00619	579427.54	4195281.16	0.00592
579455.30	4195308.08	0.00442	579625.13	4195224.37	0.00338
579597.64	4195215.33	0.00384	579541.92	4195198.50	0.00513
579509.98	4195191.30	0.00616	579473.03	4195182.53	0.00781
579433.77	4195157.54	0.01150	579439.29	4195127.94	0.01242
579491.04	4195150.05	0.00799	579532.90	4195156.57	0.00622

```
         579587.63    4195162.32        0.00474                          579453.17
4195091.25        0.01243
         579489.13    4195111.64        0.00910                          579500.28
4195086.06        0.00895
         579540.25    4195117.64        0.00666                          579577.99
4195114.72        0.00559
         579623.15    4195111.99        0.00462                          579661.76
4195112.06        0.00398
         579669.97    4195083.60        0.00403                          579641.56
4195079.20        0.00451
         579631.93    4195115.66        0.00442                          579600.67
4195083.95        0.00532
         579574.71    4195079.16        0.00602                          579546.34
4195073.35        0.00698
         579499.21    4195082.27        0.00906                          579499.80
4195040.24        0.00934
         579565.47    4195039.92        0.00648                          579608.11
4195035.38        0.00534
         579608.12    4195006.71        0.00531                          579625.95
4194979.77        0.00486
         579654.52    4194983.36        0.00438                          579649.11
4195020.72        0.00454
         579680.24    4195014.73        0.00407                          579686.87
4194989.46        0.00396
         579695.08    4194962.20        0.00380                          579415.74
4194658.45        0.00159
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        15:05:53

                                   PAGE  10
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                    **

       X-COORD (M)   Y-COORD (M)        CONC                           X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         579171.37    4194613.65        0.00103                          579201.36
4194587.03        0.00090
```

```
         579144.58    4194511.73        0.00050                          579118.00
4194598.46        0.00084
         579097.07    4194584.95        0.00079                          579079.46
4194579.64        0.00077
         579054.64    4194572.92        0.00074                          579041.98
4194550.60        0.00064
         579024.54    4194543.97        0.00061                          578981.86
4194572.89        0.00070
         578875.71    4194520.79        0.00046                          578876.60
4194496.98        0.00044
         578880.42    4194470.26        0.00041                          578919.48
4194533.14        0.00055
         578916.70    4194498.30        0.00049                          578927.03
4194465.24        0.00046
         579339.74    4195512.02        0.00196                          578544.14
4194771.46        0.00023
         578515.83    4194768.61        0.00021                          578933.53
4194936.41        0.00102
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                       ***        15:05:53

                                   PAGE  11
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER   5 YEARS ***


                                    ** CONC OF PM_10    IN MICROGRAMS/M**3
                **



                         NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR,
ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - 

ALL       1ST HIGHEST VALUE IS       0.01243 AT (  579453.17,  4195091.25,
90.74,   335.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01242 AT (  579439.29,  4195127.94,
91.45,   341.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01152 AT (  579447.35,  4195129.93,
90.89,   341.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01150 AT (  579433.77,  4195157.54,
92.37,   341.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01135 AT (  579436.40,  4195155.20,
91.97,   341.00,    0.00)  DC
```

```
         6TH HIGHEST VALUE IS       0.00934 AT (  579499.80,  4195040.24,
90.01,   335.00,    0.00)  DC
         7TH HIGHEST VALUE IS       0.00917 AT (  579376.79,  4195265.37,
96.54,   341.00,    0.00)  DC
         8TH HIGHEST VALUE IS       0.00910 AT (  579489.13,  4195111.64,
90.00,   335.00,    0.00)  DC
         9TH HIGHEST VALUE IS       0.00906 AT (  579499.21,  4195082.27,
89.68,   335.00,    0.00)  DC
        10TH HIGHEST VALUE IS       0.00895 AT (  579500.28,  4195086.06,
89.74,   335.00,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
↑ *** AERMOD - VERSION  18081 ***   *** C:\Lakes\AERMOD View\Lafayette,
PM10Exhaust\Lafayette, PM10Exhaust.i ***        09/20/19
 *** AERMET - VERSION  14134 ***   ***
                        ***        15:05:53

                                   PAGE  12
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of         6306 Informational Message(s)

 A Total of        43872 Hours Were Processed

 A Total of         5804 Calm Hours Identified

 A Total of          502 Missing Hours Identified (  1.14 Percent)


    ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


    ********   WARNING MESSAGES   ********
 MX W481   43873         MAIN: Data Remaining After End of Year. Number of Hours=
       48

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

Attachment B

EV Parking GHG Reduction

BACKGROUND

Consistent with California Air Resources Board's (CARB) recommendation that at least 10% of proposed parking spaces in multifamily homes be installed with EV charging units,[1] the project will commit to installing 56 EV parking spots, see **MM AQ-4**. The calculations presented below demonstrate that in 2022, the earliest year that the project will be operational, the reduction in GHG emissions as a result of these charging stations will be approximately 120 MT CO_2e/year.

METHODOLOGY

The methodology to calculate GHG emissions reductions for this measure is based on CARB sources, and other inputs as necessary, as summarized in the discussion table below.

The overall methodology and key inputs were derived from a technical analysis produced by CARB, "*Electric Vehicle (EV) Charging Infrastructure: Multifamily Building Standards,"* in 2018 to study the effectiveness of EV charging stations, which includes a calculation of the GHG emissions reductions produced the EV charging stations based on the estimated electric vehicle miles traveled per unit.

This estimate of GHG emissions reductions for residential EV charging units conservatively assumes that each unit will be used to charge one electric vehicle that travels the average number of miles per year for vehicles in the Bay Area Air Basin based on CARB's EMFAC2017 Web Database, and that 80% of electric vehicle charging activity occurs at home based on a study of electric vehicle use in the *Electric Vehicle Driving, Charging, and Load Shape Analysis Report* from the Electric Power Research Institute in 2018.

Using CARB-derived methodology, the assumptions and calculated inputs described below were used to derive the emissions reductions estimates:

A. The average annual vehicle miles traveled per light duty auto vehicle in the BAAQMD was calculated using information from EMFAC2017 Web Database, see **Table 1**.

B. The estimated EV miles traveled per residential EV charging unit were calculated by multiplying the average annual vehicle miles traveled per vehicle by the percentage of home charging (80%) determined by the Electric Power Research Institute (12,444 x .80 = 9,955 VMT for home charging stations), see **Table 1**.

[1] California Air Resources Board. 2018. Electric Vehicle (EV) Charging Infrastructure: Multifamily Building Standards. Available online at: https://ww3.arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf.

C. The MWh used per EV charging station was calculated multiplying the average annual vehicle miles traveled per EV vehicle (calculated in step B) by the fuel economy of an EV, see **Table 2**.

D. Avoided fossil-fueled vehicle emissions per EV charging station were calculated by multiplying the estimated EV miles per residential EV charging station by the annual GHG emission factors derived from EMFAC2017 Web Database, see **Table 3**.

E. Indirect emissions associated with the use of electricity to power the EV charging units were calculated by multiplying the calculated MWh used per EV charging station by annual estimated Pacific Gas & Electric (PG&E) emission factors, see **Table 4**.

F. Net emission reductions per residential EV charging station were calculated by subtracting the EV charging station's indirect emissions (see step E) from the avoided emissions produced by fossil-fuel vehicle miles traveled (see step D), see **Table 5**.

Table 1
Average Daily Vehicle Miles Traveled

Parameter *(italicized values were calculated based on parameters listed above them)*	**Calculated**
Average daily LDA VMT, BAAQMD	100,135,822[a]
Vehicle Population	2,792,271[a]
Calculated Average Daily VMT per LDA	*35.86*
LDA Days of Operation per Year	347[b]
Calculated Annual VMT per LDA	*12,444*

[a] California Air Resources Board, EMFAC2017 Web Database, assuming an operational year of 2022.
[b] California Air Resources Board, EMFAC 2017 Volume III Technical Documentation.

Table 2
Summary of Assumptions to Calculate EV Charging Station Reductions

Parameter *(italicized values were calculated based on parameters listed above them)*	**Assumption**
Annual Gasoline-Fueled VMT Reduction (Light-Duty Autos, BAAQMD)	12,444[a]
Portion of EV Charging Activity at Home (per vehicle)	80%[b]
Calculated Annual Gasoline-Fueled Vehicle VMT Reduction per EV charging unit	*9,955*
Fuel Economy of an EV (kWh/mile)	0.25[c]
Fuel Economy of an EV (MWh/mile)	0.00025
Calculated MWh used per EV charging unit per year	2.49

[a] California Air Resources Board, EMFAC2017 Web Database; EMFAC 2017 Volume III Technical Documentation. See **Table 1** for calculations.
[b] Electric Power Research Institute, *Electric Vehicle Driving, Charging, and Load Shape Analysis Report*.
[c] California Air Resources Board, *Electric Vehicle (EV) Charging Infrastructure: Multifamily Building Standards, Appendix H: Greenhouse Gas Reduction Estimates*, Table H1.

Table 3
Gasoline Vehicle GHG Emissions Factors

Year	CO2 (grams/ mile)	CH4 (grams/mile)	N2O (grams/mile)	MT CO2e/mile	Fossil Fuel Vehicle Annual VMT displaced by EV VMT per Unit[a]	Avoided Fossil Fuel Vehicle Emissions (MT CO2e)[b]
2022	261.50	0.0028	0.0047	0.000262	9,955	2.608

Source: California Air Resources Board, EMFAC2017 Web Database, assuming LDA Vehicle Class, 30 mph, RUNEX emissions factors for the BAAQMD.
[a] Calculated in **Table 1**.
[b] 0.000262 x 9,955 = 2.608 MT CO2e/station

Table 4
Residential EV Charging Unit GHG Emissions Factors (Emissions per MWh)

Year	MT CO2e/MWH	Calculated MWh Used per EV Charging Unit per Year[a]	Indirect Emissions from EV Charging (MT CO2e)
2015	0.1837	2.49	0.457[b]

Source: Pacific Gas & Electric. Climate Change. See PG&E's Voluntary GHG Emissions for CO2 Emissions, 2015 represents the most recent year for which verified data are available. See:
http://www.pgecorp.com/corp_responsibility/reports/2017/en02_climate_change.html.
[a] Calculated in **Table 1**.
[b] 0.1837 x 2.49 = 0.457 MT CO2e.

Table 5
Net GHG Emissions Reductions per Residential EV Charging Unit

Year	Fossil Fuel Vehicle Annual VMT displaced by EV VMT per Unit[a]	Avoided Fossil Fuel Vehicle Emissions (MT CO2e)[b]	Indirect Emissions from EV Charging (MT CO2e)[c]	Net Emissions Reductions[d]
2022	9,955	2.608	0.457	2.151

[a] Calculated in **Table 1**.
[b] Calculated in **Table 3**.
[c] Calculated in **Table 4**.
[d] 2.608 – 0.457 = 2.151 MT CO2e

RESULTS

As demonstrated in **Table 5**, the net reduction in emissions per EV Charging Station is approximately 2.15 MT CO2e/year. Therefore, if the project commits to 56 EV charging stations, the use of these stations will result in a GHG reduction of approximately 120 MT CO2e/year.