MEMORANDUM

Date: 26 October 2020

To: Geoff Reilly, Senior Associate Environmental Planner, WRA, Inc.

From: Yilin Tian, Environmental Engineer II, Baseline Environmental Consulting

Subject: Air Quality and Greenhouse Gas Technical Study, Petaluma Station, Petaluma, California.

This technical study evaluates the potential air quality and greenhouse gas (GHG) emissions impacts associated with the construction and operation of the Petaluma Station Project (proposed project) located at 315 East D Street in Petaluma, California. The proposed project consists of a mixed-use transit-oriented development. The project would include two five-story buildings containing 402 multi-family residential units, approximately 5,100 square-feet of retail space, and 624 parking spaces. The proposed project also includes upsizing of the drainage outfall from Weller Street to the Turning Basin of the Petaluma River.

This technical memorandum describes the environmental and regulatory setting relevant to the proposed project analysis, and evaluates the potential air quality and GHG emission impacts associated with implementation of the proposed project. This study will be used to support environmental review of the proposed project under the California Environmental Quality Act (CEQA).

ENVIRONMENTAL SETTING

The proposed project is located within the San Francisco Bay Area Air Basin (SFBAAB). Some air basins have natural characteristics that limit the ability of natural processes to either dilute or transport air pollutants. The major determinants of air pollution transport and dilution are climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Wind and terrain can combine to transport pollutants away from upwind areas, while solar energy can chemically transform pollutants in the air to create secondary photochemical pollutants such as ozone. The following discussion provides an overview of the existing air quality conditions in the SFBAAB.

Air Pollutants of Concern

The California Air Resources Board (CARB) and U.S. Environmental Protection Agency (EPA) focus on the following air pollutants as regional indicators of ambient air quality:

- Ozone
- Suspended particulate matter—both respirable (PM_{10}) and fine ($PM_{2.5}$)
- Nitrogen dioxide (NO_2)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Lead

Because these are the most prevalent air pollutants known to be harmful to human health, based on extensive criteria documents, they are referred to as "criteria air pollutants." In the SFBAAB, the primary criteria air pollutants of concern are ground-level ozone formed through reactions of oxides of nitrogen (NO_x) and reactive organic gases (ROG), PM_{10}, and $PM_{2.5}$. In addition to criteria air pollutants, local emissions of toxic air contaminants (TACs), such as diesel particulate matter (DPM), are a concern for nearby receptors. These primary air pollutants of concern are discussed further below.

Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation, it can be harmful to the human respiratory system and to sensitive species of plants when it reaches elevated concentrations in the lower atmosphere. Ozone is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between ROG and NO_x in the presence of sunlight. Anthropogenic sources of ROG and NO_x include vehicle tailpipe emissions and evaporation of solvents, paints, and fuels.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small, suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate matter, like pollen, forest fires, and windblown dust, are naturally occurring. In populated areas, however, most particulate matter is caused by road dust, combustion by-products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by condensation of SO_2 and ROG.

Particulate matter exposure can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

Toxic Air Contaminants

TACs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria air pollutants, which generally affect regional air quality, TAC emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount (dose), duration, chemical form, and any simultaneous exposure to other chemicals.

For risk assessment purposes, TACs are separated into carcinogens and non-carcinogens. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per 1 million exposed individuals over a lifetime of exposure. Non-carcinogenic substances are generally assumed to have a safe threshold below which health impacts would not occur. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the sum of expected exposure levels divided by the corresponding acceptable exposure levels. In the SFBAAB, adverse air quality impacts on public health from TACs are predominantly from DPM.

DPM and $PM_{2.5}$ from diesel-powered engines are a complex mixture of soot, ash particulates, metallic abrasion particles, volatile organic compounds, and other components that can contribute to a range of health problems. In 1998, CARB identified DPM from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects.[1] While diesel exhaust is a complex mixture that includes hundreds of individual constituents, under California regulatory guidelines, DPM is used as a surrogate measure of exposure for the mixture of chemicals that make up diesel exhaust as a whole. More than 90 percent of DPM is less than 1 micron in diameter, and thus is a subset of $PM_{2.5}$.[2] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

Existing Sources and Levels of Local Air Pollution

In the Bay Area, stationary and mobile sources are the primary contributors of TACs and $PM_{2.5}$ emissions to local air pollution. In an effort to promote healthy infill development from an air

[1] California Air Resources Board (CARB), 1998. Initial Statement of Reasons for Rulemaking; Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, June.

[2] California Air Resources Board (CARB), 2016. Overview: Diesel Exhaust and Health. Available at: https://www.arb.ca.gov/research/diesel/diesel-health.htm, accessed January 13, 2017. Last updated April 12, 2016.

quality perspective, the Bay Area Air Quality Management District (BAAQMD) has prepared guidance entitled *Planning Healthy Places*.[3] The purpose of this guidance document is to encourage local governments to address and minimize potential local air pollution issues early in the land-use planning process, and to provide technical tools to assist them in doing so. Based on a screening-level cumulative analysis of mobile and stationary sources in the Bay Area, the BAAQMD mapped localized areas of elevated air pollution that: 1) exceed an excess cancer risk of 100 in a million; 2) exceed $PM_{2.5}$ concentrations of 0.8 micrograms per cubic meter ($\mu g/m^3$); or 3) are located within 500 feet of a freeway, 175 feet of a major roadway (with more than 30,000 annual average daily vehicle trips), or 500 feet of a ferry terminal. Within these localized areas of elevated air pollution, the BAAQMD encourages local governments to implement best practices to reduce exposure to and emissions from local sources of air pollutants. As shown on **Figure 1**, elevated concentrations of $PM_{2.5}$ and TAC pollution currently extend across the northwest portion of the project site.

Existing Sensitive Receptors

Sensitive receptors are individuals who are more susceptible to air-quality-related health problems compared to other members of the public, such as the very young, the old, and the infirm. Sensitive land uses are places where sensitive receptors are most likely to spend their time, such as schools, convalescent homes, and hospitals. Residential areas are also considered sensitive to poor air quality because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. Parks, with outdoor exposure of congregations of people, are also considered sensitive land uses, particularly since park patrons frequently engage in strenuous activities that elevate respiration levels, increasing their susceptibility to airborne pollutants.

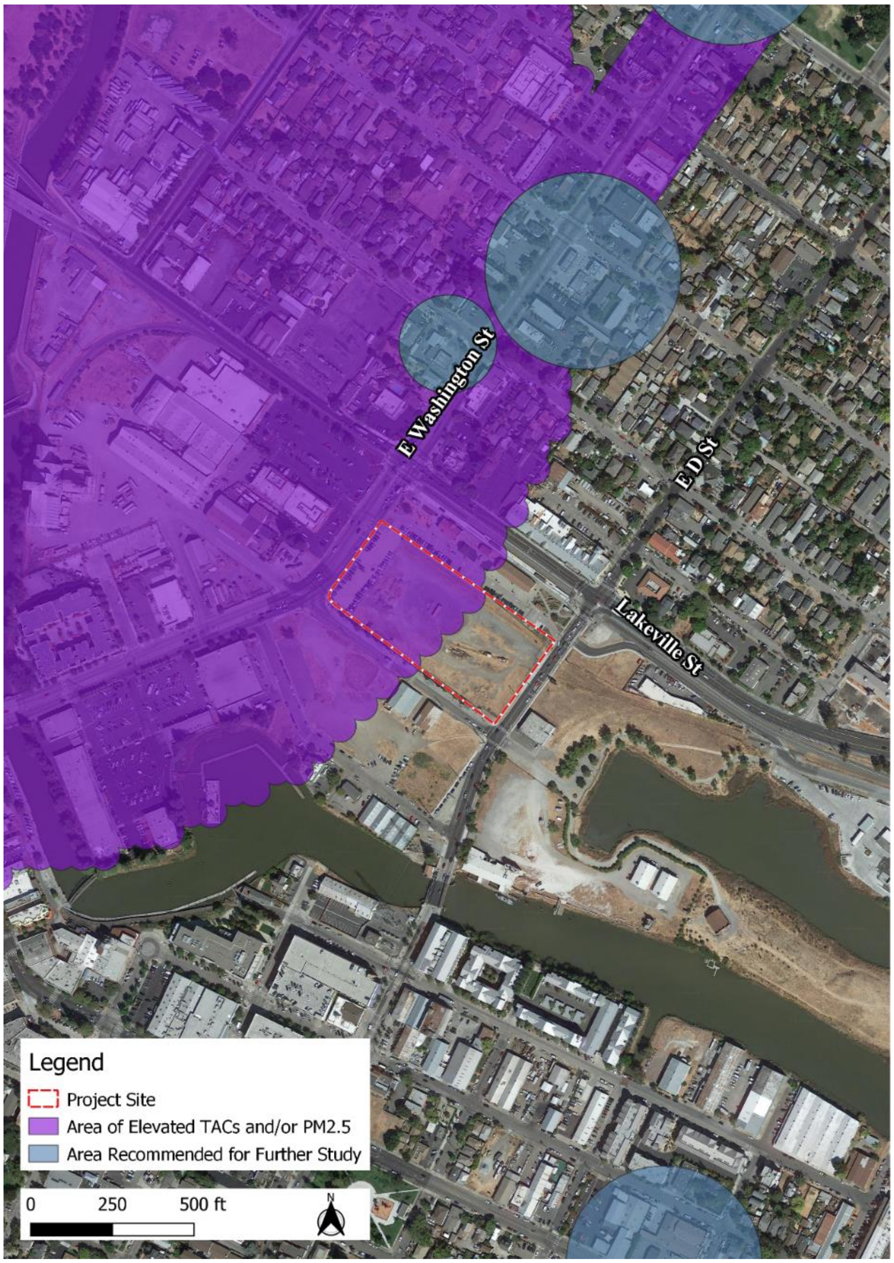
Existing sensitive land uses near the project site include single-family residential homes located about 470 feet northeast of the project site and a home daycare located about 520 feet northeast of the project site. Immediate to the west of the proposed project, a mixed-use residential development entitled Haystack Project has been approved by the City of Petaluma. Although construction of the Haystack Project has not been initiated, future occupants of the Haystack Project were considered as sensitive receptors in the construction-related health risk analysis due to the proximity to the proposed project.

As the construction of the proposed project would occur in two phases, there would be on-site residential receptors during the second phase of construction. Based on the estimated TAC concentrations from project construction, it was conservatively assumed that the South Building located in the predominant downwind direction would be constructed during the first

[3] Bay Area Air Quality Management District (BAAQMD), 2016. Planning Healthy Places; A Guidebook for Addressing Local Sources of Air Pollutants in Community Planning, May.

phase, followed by the construction of the North Building during the second phase. The future occupants of the multifamily residential units in the South Building were considered as on-site sensitive receptors during construction of the North Building.

Figure 1. Localized Areas of Elevated Air Pollution



Climate Change and GHG Emissions

Climate change refers to change in the Earth's weather patterns, including the rise in temperature due to an increase in heat-trapping GHGs in the atmosphere. Existing GHGs allow about two-thirds of the visible and ultraviolet light from the sun to pass through the atmosphere and be absorbed by the Earth's surface. To balance the absorbed incoming energy, the surface radiates thermal energy back to space at longer wavelengths primarily in the infrared part of the spectrum. Much of the thermal radiation emitted from the surface is absorbed by the GHGs in the atmosphere and is re-radiated in all directions. Since part of the re-radiation is back toward the surface and the lower atmosphere, the global surface temperatures are elevated above what they would be in the absence of GHGs. This process of trapping heat in the lower atmosphere is known as the greenhouse effect.

An increase of GHGs in the atmosphere affects the energy balance of the Earth and results in a global warming trend. Increases in global average temperatures have been observed since the mid-20th century and have been linked to observed increases in GHG emissions from anthropogenic sources. The primary GHG emissions of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), but their contribution to climate change is less than 1 percent of the total GHGs that are well-mixed (i.e., that have atmospheric lifetimes long enough to be homogeneously mixed in the troposphere).[4] Each GHG has a different global warming potential (GWP). For instance, CH_4 traps about 21 times more heat per molecule than CO_2. As a result, emissions of GHGs are reported in metric tons of carbon dioxide equivalents (CO_2e), wherein each GHG is weighted by its GWP relative to CO_2.

According to the Intergovernmental Panel on Climate Change (IPCC), the atmospheric concentrations of CO_2, CH_4, and N_2O have increased to levels unprecedented in at least the last 800,000 years due to anthropogenic sources. In 2011, the concentrations of CO_2, CH_4, and N_2O exceeded the pre-industrial era (before 1750) levels by about 40, 150, and 20 percent, respectively.[5] Earth's global surface temperatures in 2018 were the fourth warmest since 1880, which was behind those of 2016, 2017 and 2015. The past five years from 2014 to 2018 are collectively the warmest years in the modern record.[6]

[4] Intergovernmental Panel on Climate Change, 2013. Climate Change 2013; the Physical Science Basis; Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
[5] Bay Area Air Quality Management District (BAAQMD), 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases, Base Year 2011, January.
[6] National Aeronautics and Space Administration (NASA), 2019. 2018 Fourth Warmest Year in Continued Warming Trend, According to NASA, NOAA. Available at: https://www.giss.nasa.gov/research/news/20190206/, accessed April 15, 2019. Posted February 6.

The global increases in CO_2 concentration are due primarily to fossil fuel combustion and land use change (e.g., deforestation). The dominant anthropogenic sources of CH_4 are from ruminant livestock, fossil fuel extraction and use, rice paddy agriculture, and landfills, while the dominant anthropogenic sources of N_2O are from ammonia for fertilizer and industrial activity. All emissions of HFCs, PFCs, and SF_6 are not naturally-occurring and originate from industrial processes such as semiconductor manufacturing, use as refrigerants and other products, and electric power transmission and distribution.[7]

In October 2018, the IPCC published a special report on potential long-term climate change impacts based on the projected increases in temperature due to global climate change. The IPCC report found that we are already seeing the consequences of global warming due to a 1 degree Celsius (°C) increase in pre-industrial levels, such as extreme weather, rising sea levels, and diminishing Arctic sea ice. Global warming is likely to reach 1.5°C above pre-industrial levels between 2030 and 2052 if it continues to increase at the current rate. Some of the impacts due to ongoing global warming could be avoided by limiting future global warming to 1.5°C compared to 2°C. For example, by limiting global warming to 1.5°C or lower, the likelihood of an Arctic Ocean free of sea ice in summer would be ten times lower compared to the likelihood under the scenario of 2°C increase. Beyond the 1.5°C threshold, there would be significant increases in the risk associated with long-lasting or irreversible changes, such as the loss of ecosystems. The IPCC states that in order to limit the global warming to 1.5°C, rapid transitions are needed in land, energy, industry, building, transport, and urban sectors to reach the goal of carbon neutrality by 2050, which means that the Earth's production of GHG emissions each year would be removed completely through carbon offsetting, sequestration, or other means.[8]

REGULATORY SETTING

Statewide Greenhouse Gas Regulations

Executive Order S-3-05

In 2005, Governor Schwarzenegger issued Executive Order S-3-05, which states that California is vulnerable to the effects of climate change, including reduced snowpack in the Sierra Nevada Mountains, exacerbation of California's existing air quality problems, and sea level rise. To address these concerns, the executive order established the following statewide GHG emissions reduction targets:

- By 2010, reduce GHG emissions to 2000 levels.

[7] Bay Area Air Quality Management District (BAAQMD), 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases, Base Year 2011, January.
[8] IPCC, 2018. IPCC Press Release, Summary for Policymakers of IPCC Special Report on Global Warning of 1.5°C approved by governments. October 8.

- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

It should be noted that executive orders are legally binding only on State agencies and have no direct effect on local government or the private sector.

California Global Warming Solutions Act of 2006 – AB 32

In 2006, Governor Schwarzenegger signed AB 32, the California Global Warming Solutions Act, which requires California to reduce statewide GHG emissions to 1990 levels by 2020. In December 2008, CARB adopted the Scoping Plan, which outlines a statewide strategy to achieve AB 32 goals. In response to SB 375 (see below), the Association of Bay Area Governments has developed a Sustainable Communities Strategy (SCS) to integrate land use and transportation planning in the Bay Area to reduce future motor vehicle travel and decrease GHG emissions. In addition, the BAAQMD is implementing a wide range of programs that promote energy efficiency, reduce vehicle miles traveled (VMTs), and develop alternative sources of energy.

Executive Order B-30-15 and Senate Bill 32

In 2015, Governor Brown issued Executive Order B-30-15, which set a statewide GHG emissions reduction target of 40 percent below 1990 levels by 2030. This target is in addition to the previous GHG emissions reduction targets established in Executive Order S-3-05 for 2010, 2020, and 2050. In September 2016, Governor Brown signed SB 32, which codifies the GHG emissions reduction target in Executive Order B-30-15.

As required by Executive Order B-30-15 and SB 32, CARB updated the Scoping Plan to identify measures to meet the 2030 target. The revised scoping plan was adopted December 14, 2017 and builds upon the initial scoping plan initiatives used for achieving 2020 targets, such as implementation of SCSs, LCFS, and RPS. Policies target building efficiency; renewable power investment; clean and renewable fuels; vehicle emissions; walkable/bikeable communities with transit; cleaner freight and goods movement; reducing pollutants from dairies, landfills, and refrigerants; and capping emission from transportation, industry, natural gas, and electricity sources.

Title 24 Building Efficiency Standards

The State regulates energy consumption under Title 24 Building Standards Code, Part 6 of the California Code of Regulations (also known as the California Energy Code). The Title 24 Building Energy Efficiency Standards were developed by the California Energy Commission and apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and nonresidential buildings. The California Energy Code is updated every three years, with the most recent iteration (2016) effective as of January 1, 2017, and the next version (2019) planned to go into effect on January 1, 2020. The California Energy Commission's long-term vision is that future updates to the California Energy Code will support zero-net energy consumption for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and nonresidential buildings by 2030.

Title 24 California Green Building Standards Code

Title 24 Building Standards Code, Part 11 of the California Code of Regulations is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental air quality.

Local Air Quality and Greenhouse Gas Regulations

Bay Area Air Quality Management District Responsibilities

The BAAQMD is primarily responsible for ensuring that the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for criteria air pollutants are attained and maintained in the within the SFBAAB. The BAAQMD fulfills this responsibility by adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions.

The BAAQMD's CEQA Air Quality Guidelines[9] include thresholds of significance to assist lead agencies in evaluating and mitigating air quality impacts under CEQA. The BAAQMD's thresholds established levels at which emissions of ozone precursors (ROG and NOx), PM_{10}, $PM_{2.5}$, and TACs could cause significant air quality impacts. The scientific soundness of the thresholds is supported by substantial evidence presented in the BAAQMD's Revised Draft Options and Justification Report.[10] The BAAQMD's thresholds of significance are summarized in **Table 1**.

The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the SFBAAB. The climate protection program includes measures that promote energy efficiency, reduce VMTs, and develop alternative

[9] Bay Area Air Quality Management District (BAAQMD), 2017. California Environmental Quality Act Air Quality Guidelines, May.
[10] Bay Area Air Quality Management District (BAAQMD), 2009. Revised Draft Options and Justification Report; California Environmental Quality Act Thresholds of Significance, October.

sources of energy, all of which assist in reducing emissions of GHGs and in reducing air pollutants that affect the health of residents. The BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

Table 1. BAAQMD Project-level Thresholds of Significance

Impact Analysis	Pollutant	Threshold of Significance
Regional Air Quality (Construction)	ROG	54 pounds/day (average daily emission)
	NO_x	54 pounds/day (average daily emission)
	Exhaust PM_{10}	82 pounds/day (average daily emission)
	Exhaust $PM_{2.5}$	54 pounds/day (average daily emission)
	Fugitive dust (PM_{10} and $PM_{2.5}$)	Best management practices
Regional Air Quality (Operation)	ROG	54 pounds/day (average daily emission) 10 tons/year (maximum annual emission)
	NO_x	54 pounds/day (average daily emission) 10 tons/year (maximum annual emission)
	Exhaust PM_{10}	82 pounds/day (average daily emission) 15 tons/year (maximum annual emission)
	Exhaust $PM_{2.5}$	54 pounds/day (average daily emission) 10 tons/year (maximum annual emission)
	Exhaust $PM_{2.5}$ (project)	0.3 $\mu g/m^3$ (annual average)
	TACs (project)	Cancer risk increase > 10 in one million Chronic hazard index (HI) > 1.0
	Exhaust $PM_{2.5}$ (cumulative)	0.8 $\mu g/m^3$ (annual average)
	TACs (cumulative)	Cancer risk > 100 in one million Chronic hazard index > 10.0

Note: ROG = reactive organic gases; NO_x = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; $\mu g/m^3$ = micrograms per cubic meter; PPM = parts per million
Source: BAAQMD, 2017.

Sonoma County Regional Climate Action Plan – Climate Action 2020 and Beyond

The Sonoma County Regional Climate Protection Authority (RCPA) prepared a Sonoma County Regional Climate Action Plan titled "Climate Action 2020 and Beyond (CA2020)".[11] CA2020 is a collaborative effort among all nine cities and the County of Sonoma to reduce GHG emissions and respond to the impacts of climate change. The CA2020 Environmental Impact Report (EIR) was challenged in court and the court issued an adverse ruling. RCPA decided not to appeal the

[11] Sonoma County Regional Climate Protection Authority, 2016. Climate Action 2020 and Beyond - Sonoma County Regional Climate Action Plan. July

legal challenge to the CA2020 EIR.[12] Therefore, CA2020 cannot be used for CEQA-tiering of a project-level GHG analysis.

City of Petaluma Building Codes

The City of Petaluma has adopted the following codes related to GHG emissions and energy use of buildings for future projects:

- 2019 California Building Code
- 2019 California Green Building Standards Code (CALGreen Code)
- 2019 California Energy Code

City of Petaluma General Plan 2025

The Air Quality and Greenhouse Gas Elements of the City of Petaluma General Plan 2025[13] contain the following policies and programs that are applicable to the proposed project:

4-P-6 Improve air quality through required planting of trees along streets and within park and urban separators, and retaining tree and plant resources along the river and creek corridors.

A. Require planting of trees for every significant tree removed at a project site. Replacement planting may occur on the project site or on a publicly owned area, with long-term maintenance assured.

4-P-9 Require a percentage of parking spaces in large parking lots or garages to provide electrical vehicle charging facilities.

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

A. Continue to work with the Bay Area Air Quality Management District to achieve emissions reductions for non-attainment pollutants; including carbon monoxide, ozone, and PM_{10}, by implementation of air pollution control measures as required by State and federal statutes. *The BAAQMD's CEQA Guidelines should be used as the foundation for the City's review of air quality impacts under CEQA.*

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[12] RCPA Climate Action 2020 Blog. Available at: https://rcpa.ca.gov/projects/climate-action-2020/blog/. Accessed on July 23rd,2020.

[13] City of Petaluma, 2008. City of Petaluma: General Plan 2025. May

B. Continue to use Petaluma's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.
C. Continue to require development projects to abide by the standard construction dust abatement measures included in the BAAQMD's CEQA Guidelines. *These measures would reduce exhaust and particulate emissions from construction and grading activities.*
D. Reduce emissions from residential and commercial uses by requiring the following:
    - (…)
    - Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;
    - (…)
    - (…)
    - (…)

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

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

4-P-17 To avoid potential health effects and citizen complaints that may be caused by sources of odors, dust from agricultural uses, or toxic air contaminants the following measures may be considered:

- (…)
- Include buffer zones within new residential and sensitive receptor site plans to separate those uses from potential sources of odors, dust from agricultural uses, and stationary sources of toxic air contaminants.

4-P-24 Comply with AB32 and its governing regulations to the full extent of the City's jurisdictional authority.

TECHNICAL ANALYSIS

Approach to Analysis

The analysis potential project impacts related to air quality and GHG emissions was prepared in accordance with the BAAQMD CEQA Air Quality Guidelines.[14] The project's estimated emissions and/or health risks associated with ROG, NO_x, PM_{10}, $PM_{2.5}$, and TACs were compared to the BAAQMND's thresholds of significance (see **Table 1)**. The BAAQMD has also adopted and incorporated GHG thresholds of significance into their CEQA Guidelines to determine if land-use sector projects would comply with the statewide 2020 GHG reduction goal under AB 32 to reduce GHG emissions to 1990 levels. The scientific soundness of the GHG thresholds is supported by substantial evidence presented in the BAAQMD's Revised Draft Options and Justification Report.[15] The BAAQMD is in the process of updating their CEQA Guidelines to include revised significance thresholds to evaluate long-term GHG reduction goals beyond 2020.

Because the proposed project would be developed after 2020, the statewide 2030 GHG reduction goal under SB 32 to reduce GHG emissions 40 percent below 1990 levels is considered in this study for land-use sector emissions. In the absence of an updated BAAQMD threshold to evaluate if a project's land-use sector GHG emissions will achieve substantial progress toward the statewide 2030 target, an interim GHG threshold of significance has been developed for this analysis. While this interim threshold can serve to evaluate the significance of GHG emissions from construction and operation of the proposed project, this significance threshold does not necessarily set precedent for all future City projects.[16]

The interim 2030 GHG threshold of significance was developed using the same methodology used by the BAAQMD to create the 2020 GHG efficiency threshold. As shown in **Table 2**, the

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[14] Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May.

[15] Bay Area Air Quality Management District (BAAQMD). 2009. Revised Draft Options and Justification Report: California Environmental Quality Act Thresholds of Significance. October.

[16] Project-specific thresholds are not required to be formally adopted because the requirement for formal adoption of thresholds under 14 Cal Code Regs Section I 5064(b) applies only to thresholds of general application. In addition, a lead agency has discretion to accept a threshold of significance developed by the experts preparing the EIR (Mount Shasta Bioregional Ecology Ctr. v County of Siskiyou [2012] 2010 CA4th 184, 204) and the threshold of significance may be tailored to the project reviewed in the EIR (Save Cuyama Valley v County of Santa Barbara [2013] 2013 CA4th 1059, 1068).

interim 2030 GHG threshold was developed by dividing 60 percent of the 1990 land-use sector GHG emissions (assuming a 40 percent reduction) by the projected 2030 service population.

Table 2. Interim 2030 GHG Threshold of Significance

	1990[A]	2020[A]	2030[B]
Population	29,758,213	44,135,923	42,850,000
Employment	14,294,100	20,194,661	19,109,000
Service Population	44,052,313	64,330,584	61,959,000
GHG Reduction Goal	--	0%	40%
Land-Use Sector GHG Emission Goals ($MTCO_2e$)	295,530,000	295,530,000	177,318,000
Statewide GHG Efficiency Threshold ($MTCO_2e$/SP)	**6.7**	**4.6**	**2.9**

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent; SP = service population; "--" = not applicable
[A] Bay Area Air Quality Management District (BAAQMD), 2009. Revised Draft Options and Justification Report: California Environmental Quality Act Thresholds of Significance, October.
[B] The California Economic Forecast, 2018. California-County Level Economic Forecast 2018-2050. September.
Source: Baseline Environmental Consulting, 2019.

Analysis and Findings

The proposed project would generate both construction and operational emissions of criteria air pollutants and GHG. The BAAQMD recommends using the most current version of the California Emissions Estimator Model (CalEEMod Version 2016.3.2) to estimate construction and operational emissions of pollutants resulting from a proposed project. CalEEMod uses widely accepted models for emission estimates combined with appropriate default data for a variety of land-use projects that can be used if site-specific information is not available. The primary input data used to estimate emissions associated with each of the proposed project's land-use types are summarized in **Table 3**. A copy of the CalEEMod report for the project, which summarizes the input parameters, assumptions, and findings, is included as **Appendix A**.

Table 3. Project Land-Use Input Parameters

Project Development	CalEEMod Land-Use Type	Unit	Amount
Residential	Apartment Mid Rise	Dwelling Unit	402
Retail	Regional Shopping Center	1,000 square feet	5.13
Parking	Enclosed Parking with Elevator	624	Space

Note: These land use input parameters were used to evaluate emissions during both project construction and operation.
Source: A copy of CalEEMod report is provided in Appendix A.

Criteria Air Pollutants from Construction

Project construction activities would generate criteria air pollutant emissions that could potentially adversely affect regional air quality. Construction activities would include site preparation, grading, building construction, paving, and applications of architectural coatings. The primary pollutant emissions of concern during project construction would be ROG, NO_x, PM_{10}, and $PM_{2.5}$ from the exhaust of off-road construction equipment and on-road vehicles related to worker vehicles, vendor trucks, and haul trucks. In addition, fugitive ROG emissions would result from the application of architectural coatings and paving. Emissions of ROG, NO_x, PM_{10}, and $PM_{2.5}$ during project construction were estimated using the CalEEMod input parameters summarized in **Table 3** and additional assumptions summarized in **Table 4**.

Table 4. Construction Assumptions for CalEEMod

CalEEMod Input Category	Construction Assumptions and Changes to Default Data
Construction Schedule	Construction was assumed to begin in January, 2021. CalEEMod applies default equipment usage and construction phase duration based on the findings of a survey of construction projects of less than 5 acres. Lot acreage and floor surface area for each land use type were provided by the applicant. The proposed project will use a phased approach, which will change the project construction duration but not the total amount of emissions. Therefore, the assumptions described above were used to estimate the overall project construction emissions.
Construction Equipment	CalEEMod default equipment list and usage were applied to all construction phases. A drill rig (8 hr/day) was added to the site preparation phase for pile driving. In addition, the drainage outfall upsizing work was accounted for by adding an additional excavator (8 hr/day) and a pipelayer (2 hr/day) to the 8-day grading phase. Because a pipelayer is not included in the CalEEMod equipment inventory, a crane was selected as a surrogate.
Material Movement	Approximately 797 cubic yards of soil would be off-hauled and about 4,745 cubic yards of aggregate base would be imported for the project site.

Notes: Default CalEEMod data used for all other parameters are not described.
Source: A copy of CalEEMod report is provided in Appendix A.

To analyze daily emission rates, the total emissions estimated during construction were averaged over the shortest expected duration of work days (33 months x 22 work days per month = 726 work days) and compared to the BAAQMD's thresholds of significance. As shown in **Table 5**, the project's estimated emissions for ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ during construction were below the thresholds of significance and, therefore, would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.

Table 5 Estimated Construction Emissions (Pounds Per Day)

Emissions Scenario	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Construction Emissions	5.6	9.7	0.36	0.34
Thresholds of Significance	54	54	82	54
Threshold Exceedance?	**No**	**No**	**No**	**No**

Source: A copy of CalEEMod report is provided in Appendix A.

The generation of fugitive dust PM_{10} and $PM_{2.5}$ emissions from soil disturbance activities could result in a cumulatively considerable net increase in regional PM_{10} and $PM_{2.5}$ concentrations. The City's General Plan 2025 4-P-15. C requires development projects to abide by the standard construction dust abatement measures included in the BAAQMD's CEQA Guidelines. Emissions of fugitive dust would be controlled by implementation of the following best management practices (BMPs) included in the BAAQMD's CEQA Guidelines:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

Implementation of the BAAQMD's BMPs would ensure that emissions of PM_{10} and $PM_{2.5}$ from dust generated during project construction activities would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.

Criteria Air Pollutants from Operation

Common criteria pollutant emissions of concern during the operational phase of a project include ROG, NOx, PM_{10}, and $PM_{2.5}$. Operational emissions from the proposed project would primarily be from mobile sources (i.e., vehicle trips to and from the proposed project). Other common sources of emissions include energy use (e.g., electricity and natural gas), area sources (e.g., consumer products and architectural coatings), and stationary sources (e.g., emergency generators). Operation of the proposed project was assumed to begin as early as 2023. Additional project-specific information used to calculate operational emissions of criteria pollutants and GHG in CalEEMod, including changes to default data, are summarized in **Table 6**.

Table 6. Operation Assumptions for CalEEMod

CalEEMod Input Category	Operation Assumptions and Changes to Default Data
Utility Provider[A]	The default 2008 CO_2 intensity factor for Pacific Gas and Electric (641 pounds per megawatt hour) was updated to the most recent CO_2 intensity factor verified by a third party in 2018 (206 pounds per megawatt hour). The reduction in CO_2 intensity factor was mainly attributable to added renewable energy.
Woodstoves and Fireplaces	Assumed no woodstoves are included in the proposed project and all the fireplaces are natural gas-based.
Vehicle Trips	Daily trip rates for each type of land use were adjusted according to the project traffic analysis by Fehr & Peers.
Energy Use	The default 2016 Title 24 Electricity Energy Intercity and Natural Gas Energy Intensity were updated to 2019 Title 24 values.
Wastewater	No lagoons or septic tanks are used for wastewater treatment in the project area.
Water Use	In accordance with the City's Green Building Ordinance, mandatory measures from the statewide CALGreen Code to reduce indoor water use by approximately 20 percent were included.
Stationary Sources	The proposed project would not have any emergency diesel generator.

Notes: Default CalEEMod data used for all other parameters are not described.
[A] Pacific Gas and Electric Company, 2018.
Source: A copy of CalEEMod report is provided in Appendix A.
Fehr & Peers, 2020. Preliminary Transportation Assessment for the Petaluma Station Project in Petaluma, CA. Dated 2-28-2020.

As shown in **Table 7**, the estimated maximum annual emissions and average daily emissions during the operational phase of the proposed project were below the BAAQMD thresholds of significance and, therefore, would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.

Table 7. Estimated Operation Emissions

Emissions Scenario	Maximum Annual Emissions (Tons)				Average Daily Emissions (Pounds)			
	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Area	1.13	0.05	0.06	0.06	6.18	0.28	0.35	0.35
Energy	0.02	0.16	0.01	0.01	0.10	0.88	0.07	0.07
Mobile	0.56	2.68	0.02	0.02	3.04	14.67	0.10	0.09
Total Emissions	1.13	0.05	0.06	0.06	6.18	0.28	0.35	0.35
Thresholds of Significance	10	10	15	10	54	54	82	54
Threshold Exceedance?	No	No	No	No	No	No	No	No

Source: A copy of CalEEMod report is provided in Appendix A.

GHG Emissions from Construction and Operation

In accordance with the BAAQMD's CEQA guidance for evaluating the GHG thresholds of significance, the construction CO_2e emissions were annualized over a period of 40 years and then added to the expected CO_2e emissions during operation. The land-use sector GHG emissions from operation of the proposed project were evaluated based on an average service population of 1,161 people, which was determined according to the forecasted population of residents and employees.[17]

As shown in **Table 8**, the total average annual CO_2e emissions and the total average annual CO_2e emissions per service population for the proposed project are compared to the interim 2030 GHG threshold of significance. The estimated annual CO_2e emissions per service population generated by the proposed project would be below the interim 2030 GHG threshold of significance and, therefore, the project's cumulative-contribution to statewide GHG emissions would not be substantial.

Health Risk Impacts to Existing and Future Sensitive Receptors from Project Construction

The BAAQMD recommends evaluating a project's potential health risks to sensitive receptors within 1,000 feet of the project during project construction. Construction of the proposed project would generate DPM and $PM_{2.5}$ emissions from off-road diesel construction equipment and on-road heavy-duty diesel trucks that could potentially result in elevated health risks at nearby sensitive receptors.

[17] Based on an average of 2.86 persons per household (CalEEMod default) and a standard assumption of 1 employee per 500 square feet.

Table 8. Average Land-Use Sector GHG Emissions

Emission Source	CO_2e (MT/year/SP)
Construction[A]	0.02
Operation - Area	0.02
Operation - Energy	0.49
Operation - Mobile	1.61
Operation - Waste	0.08
Operation - Water	0.05
Total Project Emissions	2.3
Interim 2030 GHG Threshold	2.9
Threshold Exceedance?	No

Notes: MT = metric tons; SP = service population; "--" = not applicable.
[A] GHG emissions during construction were amortized over 40 years.
Source: A copy of the CalEEMod report is provided in Appendix A.

The annual average concentrations of DPM and exhaust $PM_{2.5}$ concentrations during construction were estimated within 1,000 feet of the project using the EPA's Industrial Source Complex Short Term (ISCST3) air dispersion model. For this analysis, emissions of exhaust PM_{10} were used as a surrogate for DPM, which is a conservative assumption because more than 90 percent of DPM is less than 1 micron in diameter. The input parameters and assumptions used for estimating emission rates of DPM and $PM_{2.5}$ from off-road diesel construction equipment are included in **Appendix B**.

The exhaust from off-road equipment was represented in the ISCST3 model as a series of volume sources with a release height of 5 meters to represent the mid-range of the expected plume rise from frequently used construction equipment. Dispersion of air pollutants from off-road construction equipment was modeled using the χ/Q ("chi over q") method, such that each source has a unit emission rate (e.g., 1 gram per second for volume sources). The annual average concentration profiles from the air dispersion model were then scaled according to the ratio between the unit emission rate and the actual emission rate from each source. Actual emission rates for off-road equipment were based on the actual hours of work and averaged over the entire duration of construction. Daily emissions from construction were assumed to primarily occur between 9:00 AM and 5:00 PM Monday through Friday.

A uniform grid of receptors spaced 10 meters apart with receptor heights of 1.8 meter (for ground-level receptors) was placed around the project site as a means of developing isopleths (i.e., concentration contours) that illustrate the dispersion pattern from the emissions sources. The ISCST3 model input parameters included 5 years of BAAQMD meteorological data from the Petaluma Airport weather station located about 2 miles northeast of the project site.

The air dispersion model was used to estimate annual average concentrations of DPM and $PM_{2.5}$ from project construction.

Based on the results of the air dispersion model (**Appendix C**), potential off-site health risks were evaluated for the existing maximally exposed individual resident (Existing MEIR) located about 470 feet to the northeast of the project site, the proposed Haystack Project maximally exposed individual resident (Haystack MEIR) located west of the project site, and the existing maximally exposed individual student (MEIS) at a daycare center located about 520 feet northeast from the project site. As the construction of the proposed project would occur in two phases, the Phase 1 Building is expected to be occupied during the last seven months of construction for Phase 2. Potential on-site health risk was evaluated for the Phase 1 building maximally exposed individual resident (Project Phase 1 MEIR) based on the results of the air dispersion model (**Appendix C**). It is conservatively assumed that all maximally exposed individuals are on the ground floor. The locations of the existing MEIR, Haystack MEIR, MEIS, and Project Phase 1 MEIR are shown in **Figure 2**.

It was conservatively assumed that the off-site receptors (Existing MEIR, Haystack MEIR, and MEIS) would be exposed to an annual average DPM concentration over the entire estimated duration of construction, which is about 2.8 years (33 months). For the on-site receptor (Project Phase 1 MEIR) the exposure duration was 0.6 year (7 months). At the three MEIR locations, the incremental increase in cancer risk from on-site DPM emissions during construction was assessed for a young child exposed to DPM starting from infancy in the third trimester of pregnancy. At the MEIS location, the incremental increase in cancer risk from on-site DPM emissions during construction was assessed for a pre-school child exposed to DPM starting at the age of 6 months. These exposure scenarios represent the most sensitive individuals who could be exposed to adverse air quality conditions in the vicinity of the project site. The input parameters and results of the health risk assessment are included in **Appendix D**.

Estimates of the health risks at the Existing MEIR, Haystack MEIR, Project Phase 1 MEIR, and MEIS from exposure to DPM and $PM_{2.5}$ concentrations during project construction are summarized and compared to the BAAQMD's thresholds of significance in **Table 9**. For all four locations, the estimated excess cancer risk and chronic HI for DPM and annual average $PM_{2.5}$ concentration from construction emissions were below the thresholds of significance. Therefore, sensitive receptors would not be exposed to substantial concentrations of TACs and $PM_{2.5}$ from project construction.

Figure 2. Cumulative Sources of TACs and $PM_{2.5}$ Emissions

Table 9. Health Risks during Project Construction

Construction Scenario	Diesel Particulate Matter Cancer Risk (per million)	Diesel Particulate Matter Chronic Hazard Index	Exhaust $PM_{2.5}$ Annual Average Concentration ($\mu g/m^3$)
Off-site			
Existing Maximally Exposed Individual Resident	1.8	<0.01	<0.01
Haystack Project Maximally Exposed Individual Resident	4.9	<0.01	<0.01
Maximally Exposed Individual Student	6.7	<0.01	<0.01
On-site			
Project Phase 1 Building Maximally Exposed Individual	5.1	0.02	0.08
Thresholds of Significance	10	1	0.3
Threshold Exceedance?	No	No	No

Notes: $\mu g/m^3$ = micrograms per cubic meter
Source: See Appendix A.

Health Risk Impacts to Existing and Future Sensitive Receptors from Project Operation

The proposed project would not add any stationary source (e.g. diesel emergency generator) that would generate TACs such as DPM and $PM_{2.5}$. Therefore, health risk impacts from project operation were not quantified.

Health Risk Impacts to Existing and Future Sensitive Receptors from Cumulative Sources

Besides health risk impacts from construction of the proposed project, it was conservatively assumed that construction of the Haystack Project would occur simultaneously to present the worst-case-exposure- scenario. To evaluate the cumulative impact of concurrent construction, it was assumed that the Haystack Project would have the same health risk impacts to existing sensitive receptors.

In addition to TACs emissions during construction, the BAAQMD recommends evaluating the potential cumulative health risks to sensitive receptors from existing and reasonably foreseeable future sources of TACs. Cumulative health risks were estimated at the MEIS for the project to represent the worst-case-exposure scenario for sensitive receptors in the project vicinity.

The BAAQMD's online screening tools were used to provide conservative estimates of how much existing and foreseeable future TAC sources would contribute to cancer risk, HI, and $PM_{2.5}$ concentrations at the MEIS. The individual health risks associated with each source were summed to find the cumulative health risk at the MEIS. The supporting health risk calculations are included in **Appendix B**.

Based on the information provided by the project applicant, there is one foreseeable future development within 1,000 feet of the project site, which is the Haystack Project. Based on the BAAQMD's Permitted Stationary Sources Risks and Hazards Screening Tool[18] and confirmation from the BAAQMD staff,[19] two existing stationary sources of TAC emissions were identified within 1,000 feet of the MEIS (**Figure 2**). Preliminary health risk screening values at the MEIS from the stationary sources are presented in **Table 10**.

Preliminary health risk screening values at the MEIS from exposure to mobile sources of TACs were estimated based on the BAAQMD's Bay Area modeling of health risks from highways, railroads, and major roadways with an average annual daily traffic (AADT) volume greater than 30,000 vehicles per day. According to the BAAQMD's modeling of mobile sources, one major roadway (East Washington St) is located within 1,000 feet of the MEIS (see **Table 10** and **Figure 2**).[20] In addition, the Sonoma-Marin Area Rail Transit (SMART) Petaluma Downtown station is adjacent to the project site to the east. The SMART trains are equipped with EPA Tier 4 diesel engines. SMART's fuel-efficient engines feature catalytic reduction technology that reduces particulates emissions.[21] The SMART passenger rail service began on August, 2017. Therefore, emissions from SMART trains were not included in the 2014 BAAQMD modeling of mobile sources. However, according to the SMART Project EIR[22], DPM emissions from the new SMART train operation are not expected to cause a significant cancer risk to nearby sensitive receptors. Worst-case-exposure-scenario results (Train idling at a station scenario-closest residence to any rail station) reported in the EIR were used to compute cumulative health risk in this study.

The BAAQMD also recommends using the Roadway Screening Analysis Calculator[23] to evaluate health risks from roadways with between 10,000 and 30,000 AADT. There is no roadway

[18] Bay Area Air Quality Management District (BAAQMD), 2020. Permitted Stationary Sources Risks and Hazards Screening Tool. Available at https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65.
[19] From: Areana Flores at the Bay Area Air Quality Management District; To: Yilin Tian at Baseline Environmental Consulting, 2020. Email Communication. March 18.
[20] Bay Area Air Quality Management District (BAAQMD), 2014. BAAQMD Planning Healthy Places Highway, Major Street, and Rail health risk raster files.
[21] SMART Train Vehicle Fact Sheet. Available at : https://www.sonomamarintrain.org/sites/default/files/Documents/SMART-Train-Vehicle-Fact-Sheet.pdf
[22] Aspen Environmental Group, 2006. Sonoma Marin Area Rail Transit Project Final Environmental Impact Report (SCH #2002112033). June
[23] Bay Area Air Quality Management District (BAAQMD), 2015. Roadway Screening Analysis Calculator, April 16.

within1,000 feet of the project site whose existing AADT could be between 10,000 and 30,000 AADT, based on the project-specific peak hour traffic information.[24]

Estimates of the cumulative health risks at the MEIS are summarized and compared to the BAAQMD's cumulative screening thresholds for health risk impacts in **Table 10**. The cumulative excess cancer risk, chronic HI, and annual average $PM_{2.5}$ concentrations at the MEIS were below the BAAQMD's screening thresholds. Therefore, the proposed project would not result in a substantial cumulative exposure of sensitive receptors to TAC and $PM_{2.5}$ concentrations.

[24] From: Eleanor Leshner at Fehr & Peers; To: Yilin Tian at Baseline Environmental Consulting, 2020. Email Communication. July 2nd.

Table 10. Cumulative Health Risks at Maximally Exposed Individual Resident (MEIS) during Construction and Operations off the Proposed Project

Source	Source Type	Method Ref	Cancer Risk (10^{-6})	Chronic HI	$PM_{2.5}$ ($\mu g/m^3$)
Project					
Off-Road Construction Equipment	Diesel Exhaust		6.7	0.00	<0.01
Concurrent Construction[A]					
Haystack Project: Off-Road Construction Equipment	Diesel Exhaust		6.7	0.00	<0.01
Existing Stationary Sources					
Petaluma Chevron (Plant #109754)	Gas Station	1,2	1.27	<0.01	NA
Petaluma Valero (Plant #111595)	Gas Station	1,2	0.69	<0.01	NA
Existing Mobile Sources					
Major Roadway	Mobile	3	16.8	NA	0.24
Petaluma Downtown SMART station	Railway	4	2.3	NA	<0.01
Future Stationary Sources					
Haystack Project	Diesel Generator	1	0.5	<0.01	<0.01
		Cumulative Health Risks	35	<0.1	0.2
		Thresholds of Significance	100	10.0	0.8
		Threshold Exceedance?	No	No	No

Notes: $\mu g/m^3$=micrograms per cubic meter; HI=hazard index; NA=not applicable; Ref=reference;
Health risk screening values derived using the following BAAQMD tools and methodologies:
1) BAAQMD's Risk and Hazards Emissions Screening Calculator (Beta Version 4.0).
2) BAAQMD's 2017 stationary source emissions data
3) BAAQMD Planning Healthy Places Highway, Major Street, and Rail health risk raster files, 2014.
4) Aspen Environmental Group, 2006. Sonoma Marin Area Rail Transit Project Final Environmental Impact Report (State Clearing House Number 2002112033). June
[A]: It was assumed that the Haystack Project has the same health risk impacts at MEIS as the proposed project.

Health Risk Impacts to Future Residents from Existing Sources

Future residents on the project site could be exposed to existing and reasonably foreseeable future sources of TAC emissions. While CEQA does not require the analysis or mitigation of potential effects the existing environment may have on a project (with certain exceptions), an analysis of the potential effects existing TAC sources may have on the future sensitive receptors at the project site was performed to provide information to the public and decision makers. The health risks posed to the closest residential receptor on the project site to each TAC source were considered to conservatively analyze cumulative health risks to all future receptors on the project site.

The approach for assessing the cumulative health risks to future sensitive receptors on the project site was the same as the methods described above to determine potential project-level health risks to existing sensitive receptors. Cumulative health risks were estimated for Project Phase 1 MEIR to represent the worst-case-exposure scenario. Existing sources of TAC emissions identified within 1,000 feet of the project included four stationary sources, the SMART Petaluma Downtown station, and one major roadway. There is also one proposed development that could potentially operate emergency diesel generators (**Table 11** and **Figure 2**). The project will introduce sensitive receptors next to trains at the Downtown SMART station. However, DPM emissions from the SMART train operation are not expected to cause a significant cancer risk to nearby sensitive receptors according to the SMART Project EIR. The cancer risk associated with the worst-case-exposure-scenario (Train idling at a station scenario-closest residence to any rail station) is 2.3 per million as presented in **Table 11**. The project will also introduce sensitive receptors next to a bus stop at the Copeland Street Transit Mall. However, idling emissions from buses and other vehicles are already accounted for in the BAAQMD's modeling of health risks from major roadways as presented in **Table 10**.

As shown in **Table 11**, the estimated cumulative cancer risk, the chronic HI, and the annual average $PM_{2.5}$ concentration at the project site would be below the BAAQMD cumulative threshold of significance. Therefore, the existing sources would not result in a substantial cumulative exposure of future project residents to TAC and $PM_{2.5}$ concentrations.

Table 11. Cumulative Health Risks at the Project Phase 1 Building Maximally Exposed Individual Resident (Project Phase 1 MEIR) on the Project Site

Source	Source Type	Method Ref	Cancer Risk (10^{-6})	Chronic HI	$PM_{2.5}$ ($\mu g/m^3$)
Project					
Off-Road Construction Equipment - last 7 months of construction	Diesel Exhaust		5.1	0.02	0.08
Existing Stationary Sources					
Petaluma Chevron (Plant #109754)	Gas Station	1,2	1.04	<0.01	NA
City of Petaluma (Plant #20509)	Diesel Generator	1,2	0.07	<0.01	<0.01
Verizon Wireless (DT Petaluma) (Plant # 19729)	Diesel Generator	1,2	0.16	<0.01	<0.01
Petaluma Valero (Plant #111595)	Gas Station	1,2	0.29	<0.01	NA
Existing Mobile Sources					
Major Roadway	Mobile	3	38.1	NA	0.55
Petaluma Downtown SMART station	Railway	4	2.3	NA	<0.01
Future Stationary Sources					
Haystack Pacifica Mixed-use Project at 215 Weller, East Washington, Copeland East D Street	Diesel Generator	1.0	10	<0.01	<0.01
		Cumulative Health Risks	57	0.02	0.6
		Thresholds of Significance	100	10.0	0.8
		Threshold Exceedance?	No	No	No

Notes: $\mu g/m^3$=micrograms per cubic meter; HI=hazard index; NA=not applicable; Ref=reference

Health risk screening values derived using the following BAAQMD tools and methodologies:

1) BAAQMD's Risk and Hazards Emissions Screening Calculator (Beta Version 4.0).

2) BAAQMD's 2017 stationary source emissions data

3) BAAQMD Planning Healthy Places Highway, Major Street, and Rail health risk raster files, 2014.

4) Aspen Environmental Group, 2006. Sonoma Marin Area Rail Transit Project Final Environmental Impact Report (SCH #2002112033). Train idling at station scenario – closest residence to any rail station. June

Conclusion

Emissions of criteria air pollutants, TACs, and GHGs from construction and operation of the proposed project would not exceed the BAAQMD thresholds of significance.

BASELINE
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APPENDICES

APPENDIX A

CALEEMOD REPORT

Petaluma Station

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	624.00	Space	0.00	214,000.00	0
Apartments Mid Rise	402.00	Dwelling Unit	4.80	209,100.00	1150
Regional Shopping Center	5.13	1000sqft	0.00	5,129.00	10

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2023

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 206 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E's CO2 Intensity Factor modified to most recent value from 2018

Land Use - Lot acreage and sqare feet for each land use type were provided by applicant. Service population of retail assumed 1 employee per 500 sqft.

Construction Phase - no demoliton phase

Off-road Equipment - This project doesn't have demolition phase

Off-road Equipment - Added one excavator and one crane for outfall upsizing work. Crane is used as a surrogate for pipelayer.

Off-road Equipment -

Trips and VMT -

Grading - Import and export volumes provided by the applicant

Vehicle Trips - Trip generation provided by traffic consultant.

Woodstoves - Assume no woodstoves and all fireplaces are natural gas fireplaces. Number of no fireplaces scaled accordingly

Energy Use - Modified for 2019 Title 24

Water And Wastewater - No septic tank or lagoons would be used for wastewater treatment

Water Mitigation - CalGreen: 20 percent reduction.

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	741.44	572.39
tblEnergyUse	LightingElect	5.25	4.34
tblEnergyUse	T24E	332.81	297.20
tblEnergyUse	T24E	2.76	2.46
tblFireplaces	NumberGas	60.30	114.25
tblFireplaces	NumberNoFireplace	16.08	30.47
tblFireplaces	NumberWood	68.34	0.00
tblGrading	MaterialExported	0.00	797.00
tblGrading	MaterialImported	0.00	4,745.00
tblLandUse	LandUseSquareFeet	249,600.00	214,000.00
tblLandUse	LandUseSquareFeet	402,000.00	209,100.00
tblLandUse	LandUseSquareFeet	5,130.00	5,129.00

tblLandUse	LotAcreage	5.62	0.00
tblLandUse	LotAcreage	10.58	4.80
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	Population	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	206
tblVehicleTrips	ST_TR	6.39	4.54
tblVehicleTrips	ST_TR	49.97	38.31
tblVehicleTrips	SU_TR	5.86	4.17
tblVehicleTrips	SU_TR	25.24	19.35
tblVehicleTrips	WD_TR	6.65	4.73
tblVehicleTrips	WD_TR	42.70	32.74
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.4610	3.4041	3.6560	9.3100e-003	0.4769	0.1253	0.6022	0.1476	0.1176	0.2651	0.0000	843.6162	843.6162	0.0965	0.0000	846.0294
2022	1.5610	0.1256	0.1795	3.4000e-004	0.0103	6.0300e-003	0.0163	2.7500e-003	5.6400e-003	8.3800e-003	0.0000	29.7219	29.7219	5.7100e-003	0.0000	29.8647
Maximum	**1.5610**	**3.4041**	**3.6560**	**9.3100e-003**	**0.4769**	**0.1253**	**0.6022**	**0.1476**	**0.1176**	**0.2651**	**0.0000**	**843.6162**	**843.6162**	**0.0965**	**0.0000**	**846.0294**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.4610	3.4041	3.6560	9.3100e-003	0.4769	0.1253	0.6022	0.1476	0.1176	0.2651	0.0000	843.6158	843.6158	0.0965	0.0000	846.0290
2022	1.5610	0.1256	0.1795	3.4000e-004	0.0103	6.0300e-003	0.0163	2.7500e-003	5.6400e-003	8.3800e-003	0.0000	29.7219	29.7219	5.7100e-003	0.0000	29.8647
Maximum	**1.5610**	**3.4041**	**3.6560**	**9.3100e-003**	**0.4769**	**0.1253**	**0.6022**	**0.1476**	**0.1176**	**0.2651**	**0.0000**	**843.6158**	**843.6158**	**0.0965**	**0.0000**	**846.0290**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2021**	**3-31-2021**	0.8228	0.8228
2	**4-1-2021**	**6-30-2021**	1.0036	1.0036
3	**7-1-2021**	**9-30-2021**	1.0146	1.0146
4	**10-1-2021**	**12-31-2021**	1.0303	1.0303
5	**1-1-2022**	**3-31-2022**	1.7448	1.7448
		Highest	1.7448	1.7448

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1284	0.0515	3.2836	1.1700e-003		0.0644	0.0644		0.0644	0.0644	6.2699	19.1499	25.4198	0.0343	2.6000e-004	26.3553
Energy	0.0188	0.1606	0.0686	1.0300e-003		0.0130	0.0130		0.0130	0.0130	0.0000	455.0903	455.0903	0.0415	0.0113	459.4784
Mobile	0.5552	2.6766	6.0952	0.0203	1.6977	0.0178	1.7155	0.4568	0.0167	0.4735	0.0000	1,867.1010	1,867.1010	0.0755	0.0000	1,868.9876
Waste						0.0000	0.0000		0.0000	0.0000	38.6312	0.0000	38.6312	2.2830	0.0000	95.7072
Water						0.0000	0.0000		0.0000	0.0000	9.4012	18.9112	28.3124	0.0350	0.0210	35.4445
Total	**1.7024**	**2.8887**	**9.4474**	**0.0225**	**1.6977**	**0.0952**	**1.7929**	**0.4568**	**0.0940**	**0.5508**	**54.3023**	**2,360.2524**	**2,414.5547**	**2.4693**	**0.0325**	**2,485.9729**

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	1.1284	0.0515	3.2836	1.1700e-003		0.0644	0.0644		0.0644	0.0644	6.2699	19.1499	25.4198	0.0343	2.6000e-004	26.3553
Energy	0.0188	0.1606	0.0686	1.0300e-003		0.0130	0.0130		0.0130	0.0130	0.0000	455.0903	455.0903	0.0415	0.0113	459.4784
Mobile	0.5552	2.6766	6.0952	0.0203	1.6977	0.0178	1.7155	0.4568	0.0167	0.4735	0.0000	1,867.1010	1,867.1010	0.0755	0.0000	1,868.9876
Waste						0.0000	0.0000		0.0000	0.0000	38.6312	0.0000	38.6312	2.2830	0.0000	95.7072
Water						0.0000	0.0000		0.0000	0.0000	7.5210	16.2242	23.7452	0.0282	0.0168	29.4642
Total	**1.7024**	**2.8887**	**9.4474**	**0.0225**	**1.6977**	**0.0952**	**1.7929**	**0.4568**	**0.0940**	**0.5508**	**52.4220**	**2,357.5655**	**2,409.9875**	**2.4624**	**0.0283**	**2,479.9927**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.46**	**0.11**	**0.19**	**0.28**	**12.83**	**0.24**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2021	2/4/2021	5	5	
2	Grading	Grading	2/5/2021	2/16/2021	5	8	
3	Building Construction	Building Construction	2/17/2021	1/4/2022	5	230	
4	Paving	Paving	1/5/2022	1/28/2022	5	18	
5	Architectural Coating	Architectural Coating	1/29/2022	2/23/2022	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 423,428; Residential Outdoor: 141,143; Non-Residential Indoor: 7,694; Non-Residential Outdoor: 2,565; Striped Parking Area: 12,840 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Bore/Drill Rigs	1	8.00	221	0.50
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Cranes	1	2.00	231	0.29
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	593.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	381.00	79.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	76.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0104	0.1088	0.0581	1.2000e-004		5.3400e-003	5.3400e-003		4.9100e-003	4.9100e-003	0.0000	10.4275	10.4275	3.3700e-003	0.0000	10.5118
Total	**0.0104**	**0.1088**	**0.0581**	**1.2000e-004**	**0.0452**	**5.3400e-003**	**0.0505**	**0.0248**	**4.9100e-003**	**0.0297**	**0.0000**	**10.4275**	**10.4275**	**3.3700e-003**	**0.0000**	**10.5118**

3.2 Site Preparation - 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	2.2000e-004	1.5000e-004	1.5800e-003	0.0000	3.9000e-004	0.0000	4.0000e-004	1.0000e-004	0.0000	1.1000e-004	0.0000	0.3490	0.3490	1.0000e-005	0.0000	0.3493
Total	**2.2000e-004**	**1.5000e-004**	**1.5800e-003**	**0.0000**	**3.9000e-004**	**0.0000**	**4.0000e-004**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3490**	**0.3490**	**1.0000e-005**	**0.0000**	**0.3493**

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					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0104	0.1088	0.0581	1.2000e-004		5.3400e-003	5.3400e-003		4.9100e-003	4.9100e-003	0.0000	10.4274	10.4274	3.3700e-003	0.0000	10.5118
Total	**0.0104**	**0.1088**	**0.0581**	**1.2000e-004**	**0.0452**	**5.3400e-003**	**0.0505**	**0.0248**	**4.9100e-003**	**0.0297**	**0.0000**	**10.4274**	**10.4274**	**3.3700e-003**	**0.0000**	**10.5118**

3.2 Site Preparation - 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	2.2000e-004	1.5000e-004	1.5800e-003	0.0000	3.9000e-004	0.0000	4.0000e-004	1.0000e-004	0.0000	1.1000e-004	0.0000	0.3490	0.3490	1.0000e-005	0.0000	0.3493
Total	**2.2000e-004**	**1.5000e-004**	**1.5800e-003**	**0.0000**	**3.9000e-004**	**0.0000**	**4.0000e-004**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3490**	**0.3490**	**1.0000e-005**	**0.0000**	**0.3493**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0265	0.0000	0.0265	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1124	0.0785	1.5000e-004		5.2500e-003	5.2500e-003		4.8300e-003	4.8300e-003	0.0000	12.7434	12.7434	4.1200e-003	0.0000	12.8465
Total	**0.0105**	**0.1124**	**0.0785**	**1.5000e-004**	**0.0265**	**5.2500e-003**	**0.0318**	**0.0135**	**4.8300e-003**	**0.0184**	**0.0000**	**12.7434**	**12.7434**	**4.1200e-003**	**0.0000**	**12.8465**

3.3 Grading - 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	2.2200e-003	0.0806	0.0171	2.3000e-004	4.9200e-003	2.8000e-004	5.1900e-003	1.3500e-003	2.6000e-004	1.6100e-003	0.0000	22.5422	22.5422	1.3900e-003	0.0000	22.5768
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	3.5000e-004	2.5000e-004	2.5200e-003	1.0000e-005	6.3000e-004	0.0000	6.3000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.5584	0.5584	2.0000e-005	0.0000	0.5588
Total	**2.5700e-003**	**0.0808**	**0.0197**	**2.4000e-004**	**5.5500e-003**	**2.8000e-004**	**5.8200e-003**	**1.5200e-003**	**2.6000e-004**	**1.7800e-003**	**0.0000**	**23.1005**	**23.1005**	**1.4100e-003**	**0.0000**	**23.1357**

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					0.0265	0.0000	0.0265	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1124	0.0785	1.5000e-004		5.2500e-003	5.2500e-003		4.8300e-003	4.8300e-003	0.0000	12.7434	12.7434	4.1200e-003	0.0000	12.8465
Total	**0.0105**	**0.1124**	**0.0785**	**1.5000e-004**	**0.0265**	**5.2500e-003**	**0.0318**	**0.0135**	**4.8300e-003**	**0.0184**	**0.0000**	**12.7434**	**12.7434**	**4.1200e-003**	**0.0000**	**12.8465**

3.3 Grading - 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	2.2200e-003	0.0806	0.0171	2.3000e-004	4.9200e-003	2.8000e-004	5.1900e-003	1.3500e-003	2.6000e-004	1.6100e-003	0.0000	22.5422	22.5422	1.3900e-003	0.0000	22.5768
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	3.5000e-004	2.5000e-004	2.5200e-003	1.0000e-005	6.3000e-004	0.0000	6.3000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.5584	0.5584	2.0000e-005	0.0000	0.5588
Total	**2.5700e-003**	**0.0808**	**0.0197**	**2.4000e-004**	**5.5500e-003**	**2.8000e-004**	**5.8200e-003**	**1.5200e-003**	**2.6000e-004**	**1.7800e-003**	**0.0000**	**23.1005**	**23.1005**	**1.4100e-003**	**0.0000**	**23.1357**

3.4 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	0.2167	1.9873	1.8896	3.0700e-003		0.1093	0.1093		0.1028	0.1028	0.0000	264.0665	264.0665	0.0637	0.0000	265.6592
Total	**0.2167**	**1.9873**	**1.8896**	**3.0700e-003**		**0.1093**	**0.1093**		**0.1028**	**0.1028**	**0.0000**	**264.0665**	**264.0665**	**0.0637**	**0.0000**	**265.6592**

3.4 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	0.0286	0.9805	0.2401	2.3800e-003	0.0584	2.4600e-003	0.0608	0.0169	2.3500e-003	0.0192	0.0000	229.7806	229.7806	0.0137	0.0000	230.1220
Worker	0.1920	0.1342	1.3685	3.3600e-003	0.3409	2.6600e-003	0.3435	0.0907	2.4600e-003	0.0932	0.0000	303.1487	303.1487	0.0103	0.0000	303.4050
Total	**0.2206**	**1.1147**	**1.6086**	**5.7400e-003**	**0.3993**	**5.1200e-003**	**0.4044**	**0.1076**	**4.8100e-003**	**0.1124**	**0.0000**	**532.9293**	**532.9293**	**0.0239**	**0.0000**	**533.5270**

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	0.2167	1.9873	1.8896	3.0700e-003		0.1093	0.1093		0.1028	0.1028	0.0000	264.0662	264.0662	0.0637	0.0000	265.6589
Total	**0.2167**	**1.9873**	**1.8896**	**3.0700e-003**		**0.1093**	**0.1093**		**0.1028**	**0.1028**	**0.0000**	**264.0662**	**264.0662**	**0.0637**	**0.0000**	**265.6589**

3.4 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	0.0286	0.9805	0.2401	2.3800e-003	0.0584	2.4600e-003	0.0608	0.0169	2.3500e-003	0.0192	0.0000	229.7806	229.7806	0.0137	0.0000	230.1220
Worker	0.1920	0.1342	1.3685	3.3600e-003	0.3409	2.6600e-003	0.3435	0.0907	2.4600e-003	0.0932	0.0000	303.1487	303.1487	0.0103	0.0000	303.4050
Total	**0.2206**	**1.1147**	**1.6086**	**5.7400e-003**	**0.3993**	**5.1200e-003**	**0.4044**	**0.1076**	**4.8100e-003**	**0.1124**	**0.0000**	**532.9293**	**532.9293**	**0.0239**	**0.0000**	**533.5270**

3.4 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	1.7100e-003	0.0156	0.0164	3.0000e-005		8.1000e-004	8.1000e-004		7.6000e-004	7.6000e-004	0.0000	2.3173	2.3173	5.6000e-004	0.0000	2.3311
Total	**1.7100e-003**	**0.0156**	**0.0164**	**3.0000e-005**		**8.1000e-004**	**8.1000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**2.3173**	**2.3173**	**5.6000e-004**	**0.0000**	**2.3311**

3.4 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	2.3000e-004	8.1700e-003	1.9300e-003	2.0000e-005	5.1000e-004	2.0000e-005	5.3000e-004	1.5000e-004	2.0000e-005	1.7000e-004	0.0000	1.9969	1.9969	1.2000e-004	0.0000	1.9998
Worker	1.5600e-003	1.0500e-003	0.0108	3.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	8.0000e-004	2.0000e-005	8.2000e-004	0.0000	2.5619	2.5619	8.0000e-005	0.0000	2.5639
Total	**1.7900e-003**	**9.2200e-003**	**0.0127**	**5.0000e-005**	**3.5000e-003**	**4.0000e-005**	**3.5400e-003**	**9.5000e-004**	**4.0000e-005**	**9.9000e-004**	**0.0000**	**4.5588**	**4.5588**	**2.0000e-004**	**0.0000**	**4.5637**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7100e-003	0.0156	0.0164	3.0000e-005		8.1000e-004	8.1000e-004		7.6000e-004	7.6000e-004	0.0000	2.3173	2.3173	5.6000e-004	0.0000	2.3311
Total	**1.7100e-003**	**0.0156**	**0.0164**	**3.0000e-005**		**8.1000e-004**	**8.1000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**2.3173**	**2.3173**	**5.6000e-004**	**0.0000**	**2.3311**

3.4 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	2.3000e-004	8.1700e-003	1.9300e-003	2.0000e-005	5.1000e-004	2.0000e-005	5.3000e-004	1.5000e-004	2.0000e-005	1.7000e-004	0.0000	1.9969	1.9969	1.2000e-004	0.0000	1.9998
Worker	1.5600e-003	1.0500e-003	0.0108	3.0000e-005	2.9900e-003	2.0000e-005	3.0100e-003	8.0000e-004	2.0000e-005	8.2000e-004	0.0000	2.5619	2.5619	8.0000e-005	0.0000	2.5639
Total	**1.7900e-003**	**9.2200e-003**	**0.0127**	**5.0000e-005**	**3.5000e-003**	**4.0000e-005**	**3.5400e-003**	**9.5000e-004**	**4.0000e-005**	**9.9000e-004**	**0.0000**	**4.5588**	**4.5588**	**2.0000e-004**	**0.0000**	**4.5637**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.7900e-003	0.0857	0.1098	1.7000e-004		4.3900e-003	4.3900e-003		4.0500e-003	4.0500e-003	0.0000	14.7383	14.7383	4.6300e-003	0.0000	14.8540
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.7900e-003**	**0.0857**	**0.1098**	**1.7000e-004**		**4.3900e-003**	**4.3900e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**14.7383**	**14.7383**	**4.6300e-003**	**0.0000**	**14.8540**

3.5 Paving - 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	7.4000e-004	4.9000e-004	5.0800e-003	1.0000e-005	1.4100e-003	1.0000e-005	1.4200e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2104	1.2104	4.0000e-005	0.0000	1.2113
Total	**7.4000e-004**	**4.9000e-004**	**5.0800e-003**	**1.0000e-005**	**1.4100e-003**	**1.0000e-005**	**1.4200e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.2104**	**1.2104**	**4.0000e-005**	**0.0000**	**1.2113**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.7900e-003	0.0857	0.1098	1.7000e-004		4.3900e-003	4.3900e-003		4.0500e-003	4.0500e-003	0.0000	14.7383	14.7383	4.6300e-003	0.0000	14.8540
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.7900e-003**	**0.0857**	**0.1098**	**1.7000e-004**		**4.3900e-003**	**4.3900e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**14.7383**	**14.7383**	**4.6300e-003**	**0.0000**	**14.8540**

3.5 Paving - 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	7.4000e-004	4.9000e-004	5.0800e-003	1.0000e-005	1.4100e-003	1.0000e-005	1.4200e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2104	1.2104	4.0000e-005	0.0000	1.2113
Total	**7.4000e-004**	**4.9000e-004**	**5.0800e-003**	**1.0000e-005**	**1.4100e-003**	**1.0000e-005**	**1.4200e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.2104**	**1.2104**	**4.0000e-005**	**0.0000**	**1.2113**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.5433					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8400e-003	0.0127	0.0163	3.0000e-005		7.4000e-004	7.4000e-004		7.4000e-004	7.4000e-004	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**1.5452**	**0.0127**	**0.0163**	**3.0000e-005**		**7.4000e-004**	**7.4000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 Architectural Coating - 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	2.8000e-003	1.8800e-003	0.0193	5.0000e-005	5.3700e-003	4.0000e-005	5.4100e-003	1.4300e-003	4.0000e-005	1.4700e-003	0.0000	4.5993	4.5993	1.4000e-004	0.0000	4.6029
Total	**2.8000e-003**	**1.8800e-003**	**0.0193**	**5.0000e-005**	**5.3700e-003**	**4.0000e-005**	**5.4100e-003**	**1.4300e-003**	**4.0000e-005**	**1.4700e-003**	**0.0000**	**4.5993**	**4.5993**	**1.4000e-004**	**0.0000**	**4.6029**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.5433					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8400e-003	0.0127	0.0163	3.0000e-005		7.4000e-004	7.4000e-004		7.4000e-004	7.4000e-004	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**1.5452**	**0.0127**	**0.0163**	**3.0000e-005**		**7.4000e-004**	**7.4000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 Architectural Coating - 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	2.8000e-003	1.8800e-003	0.0193	5.0000e-005	5.3700e-003	4.0000e-005	5.4100e-003	1.4300e-003	4.0000e-005	1.4700e-003	0.0000	4.5993	4.5993	1.4000e-004	0.0000	4.6029
Total	**2.8000e-003**	**1.8800e-003**	**0.0193**	**5.0000e-005**	**5.3700e-003**	**4.0000e-005**	**5.4100e-003**	**1.4300e-003**	**4.0000e-005**	**1.4700e-003**	**0.0000**	**4.5993**	**4.5993**	**1.4000e-004**	**0.0000**	**4.6029**

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	0.5552	2.6766	6.0952	0.0203	1.6977	0.0178	1.7155	0.4568	0.0167	0.4735	0.0000	1,867.1010	1,867.1010	0.0755	0.0000	1,868.9876
Unmitigated	0.5552	2.6766	6.0952	0.0203	1.6977	0.0178	1.7155	0.4568	0.0167	0.4735	0.0000	1,867.1010	1,867.1010	0.0755	0.0000	1,868.9876

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,901.46	1,825.08	1676.34	4,292,148	4,292,148
Enclosed Parking with Elevator	0.00	0.00	0.00		
Regional Shopping Center	167.96	196.53	99.27	284,430	284,430
Total	2,069.42	2,021.61	1,775.61	4,576,578	4,576,578

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 Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.594113	0.036394	0.166849	0.102253	0.024126	0.006070	0.030484	0.028024	0.003137	0.001706	0.004997	0.000880	0.000967
Enclosed Parking with Elevator	0.594113	0.036394	0.166849	0.102253	0.024126	0.006070	0.030484	0.028024	0.003137	0.001706	0.004997	0.000880	0.000967
Regional Shopping Center	0.594113	0.036394	0.166849	0.102253	0.024126	0.006070	0.030484	0.028024	0.003137	0.001706	0.004997	0.000880	0.000967

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	269.1060	269.1060	0.0379	7.8400e-003	272.3888
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	269.1060	269.1060	0.0379	7.8400e-003	272.3888
NaturalGas Mitigated	0.0188	0.1606	0.0686	1.0300e-003		0.0130	0.0130		0.0130	0.0130	0.0000	185.9843	185.9843	3.5600e-003	3.4100e-003	187.0895
NaturalGas Unmitigated	0.0188	0.1606	0.0686	1.0300e-003		0.0130	0.0130		0.0130	0.0130	0.0000	185.9843	185.9843	3.5600e-003	3.4100e-003	187.0895

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 Mid Rise	3.47306e+006	0.0187	0.1600	0.0681	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	185.3357	185.3357	3.5500e-003	3.4000e-003	186.4370
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	12155.7	7.0000e-005	6.0000e-004	5.0000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6487	0.6487	1.0000e-005	1.0000e-005	0.6525
Total		**0.0188**	**0.1606**	**0.0686**	**1.0200e-003**		**0.0130**	**0.0130**		**0.0130**	**0.0130**	**0.0000**	**185.9843**	**185.9843**	**3.5600e-003**	**3.4100e-003**	**187.0895**

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 Mid Rise	3.47306e+006	0.0187	0.1600	0.0681	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	185.3357	185.3357	3.5500e-003	3.4000e-003	186.4370
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	12155.7	7.0000e-005	6.0000e-004	5.0000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6487	0.6487	1.0000e-005	1.0000e-005	0.6525
Total		**0.0188**	**0.1606**	**0.0686**	**1.0200e-003**		**0.0130**	**0.0130**		**0.0130**	**0.0130**	**0.0000**	**185.9843**	**185.9843**	**3.5600e-003**	**3.4100e-003**	**187.0895**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.57732e +006	147.3851	0.0208	4.2900e-003	149.1831
Enclosed Parking with Elevator	1.25404e +006	117.1775	0.0165	3.4100e-003	118.6070
Regional Shopping Center	48622.9	4.5433	6.4000e-004	1.3000e-004	4.5988
Total		**269.1060**	**0.0379**	**7.8300e-003**	**272.3888**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.57732e +006	147.3851	0.0208	4.2900e-003	149.1831
Enclosed Parking with Elevator	1.25404e +006	117.1775	0.0165	3.4100e-003	118.6070
Regional Shopping Center	48622.9	4.5433	6.4000e-004	1.3000e-004	4.5988
Total		**269.1060**	**0.0379**	**7.8300e-003**	**272.3888**

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	1.1284	0.0515	3.2836	1.1700e-003		0.0644	0.0644		0.0644	0.0644	6.2699	19.1499	25.4198	0.0343	2.6000e-004	26.3553
Unmitigated	1.1284	0.0515	3.2836	1.1700e-003		0.0644	0.0644		0.0644	0.0644	6.2699	19.1499	25.4198	0.0343	2.6000e-004	26.3553

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	0.1543					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8505					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0331	0.0170	0.2923	1.0200e-003		0.0478	0.0478		0.0478	0.0478	6.2699	14.2629	20.5328	0.0296	2.6000e-004	21.3503
Landscaping	0.0905	0.0345	2.9913	1.6000e-004		0.0166	0.0166		0.0166	0.0166	0.0000	4.8870	4.8870	4.7200e-003	0.0000	5.0050
Total	**1.1284**	**0.0515**	**3.2836**	**1.1800e-003**		**0.0644**	**0.0644**		**0.0644**	**0.0644**	**6.2699**	**19.1499**	**25.4198**	**0.0343**	**2.6000e-004**	**26.3553**

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	0.1543					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8505					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0331	0.0170	0.2923	1.0200e-003		0.0478	0.0478		0.0478	0.0478	6.2699	14.2629	20.5328	0.0296	2.6000e-004	21.3503
Landscaping	0.0905	0.0345	2.9913	1.6000e-004		0.0166	0.0166		0.0166	0.0166	0.0000	4.8870	4.8870	4.7200e-003	0.0000	5.0050
Total	**1.1284**	**0.0515**	**3.2836**	**1.1800e-003**		**0.0644**	**0.0644**		**0.0644**	**0.0644**	**6.2699**	**19.1499**	**25.4198**	**0.0343**	**2.6000e-004**	**26.3553**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	23.7452	0.0282	0.0168	29.4642
Unmitigated	28.3124	0.0350	0.0210	35.4445

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	26.1919 / 16.5123	27.9097	0.0345	0.0207	34.9398
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.379992 / 0.232898	0.4027	5.0000e-004	3.0000e-004	0.5047
Total		**28.3124**	**0.0350**	**0.0210**	**35.4445**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	20.9535 / 16.5123	23.4078	0.0278	0.0166	29.0451
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.303994 / 0.232898	0.3374	4.0000e-004	2.4000e-004	0.4192
Total		**23.7452**	**0.0282**	**0.0168**	**29.4642**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	38.6312	2.2830	0.0000	95.7072
Unmitigated	38.6312	2.2830	0.0000	95.7072

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	184.92	37.5371	2.2184	0.0000	92.9966
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.39	1.0941	0.0647	0.0000	2.7106
Total		**38.6312**	**2.2830**	**0.0000**	**95.7072**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	184.92	37.5371	2.2184	0.0000	92.9966
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.39	1.0941	0.0647	0.0000	2.7106
Total		**38.6312**	**2.2830**	**0.0000**	**95.7072**

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

APPENDIX B

SUMMARY OF ISCST3 MODEL PARAMETERS, ASSUMPTIONS, AND RESULTS FOR DPM AND PM2.5 EMISSIONS DURING CONSTRUCTION

Summary of ISCST3 Model Parameters, Assumptions, and Results for DPM and $PM_{2.5}$ Emissions during Construction

ISCST3 Model Parameters and Assumptions			
Source Type	**Units**	**Value**	**Notes**
Volume Source: Off-Road Equipment Exhaust			
Hours/Work Day	hours/day	8.00	Assume construction would occur 9AM-5PM Monday through Friday
DPM Emission Rate	gram/second	0.005464	Exhaust PM_{10} from off-road equipment
Number of Sources	count	133	SMAQMD, 2015
Emission Rate/Source	gram/second	0.000041	Scaling factor is (1/Emission Rate) to convert result from ISCST3
Release Height	meters	5.0	SMAQMD, 2015
Length of Side	meters	10.0	SMAQMD, 2015
Initial Lateral Dimension	meters	2.3	ISCST3 Calculator
Initial Vertical Dimension	meters	1.0	SMAQMD, 2015
ISCST3 Model Results			
Sensitive Receptor	**Pollutant**	**Annual Average Concentration**	**Notes**
Existing MEIR	DPM (μg/m^3)	0.0050	Nearest existing residential receptor
	$PM_{2.5}$ (μg/m^3)	0.0047	Nearest existing residential receptor
MEIS	DPM (μg/m^3)	0.0045	Nearest school receptor
	$PM_{2.5}$ (μg/m^3)	0.0042	Nearest school receptor
Project Phase 1 MEIR	DPM (μg/m^3)	0.0874	Project phase 1 residential receptor
	$PM_{2.5}$ (μg/m^3)	0.0822	Project phase 1 residential receptor
Haystack MEIR	DPM (μg/m^3)	0.0135	Haystack project residential receptor
	$PM_{2.5}$ (μg/m^3)	0.0127	Haystack project residential receptor

Notes:

DPM = diesel particulate matter

PM_{10} = particulate matter with aerodynamic resistance diameters equal to or less than 10 microns

$PM_{2.5}$ = particulate matter with aerodynamic resistance diameters equal to or less than 2.5 microns

μg/m^3 = micrograms per cubic meter

Sacramento Metropolitan Air Quality Management District (SMAQMD), 2015. *Guide to Air Quality Assessment in Sacramento County* . June.

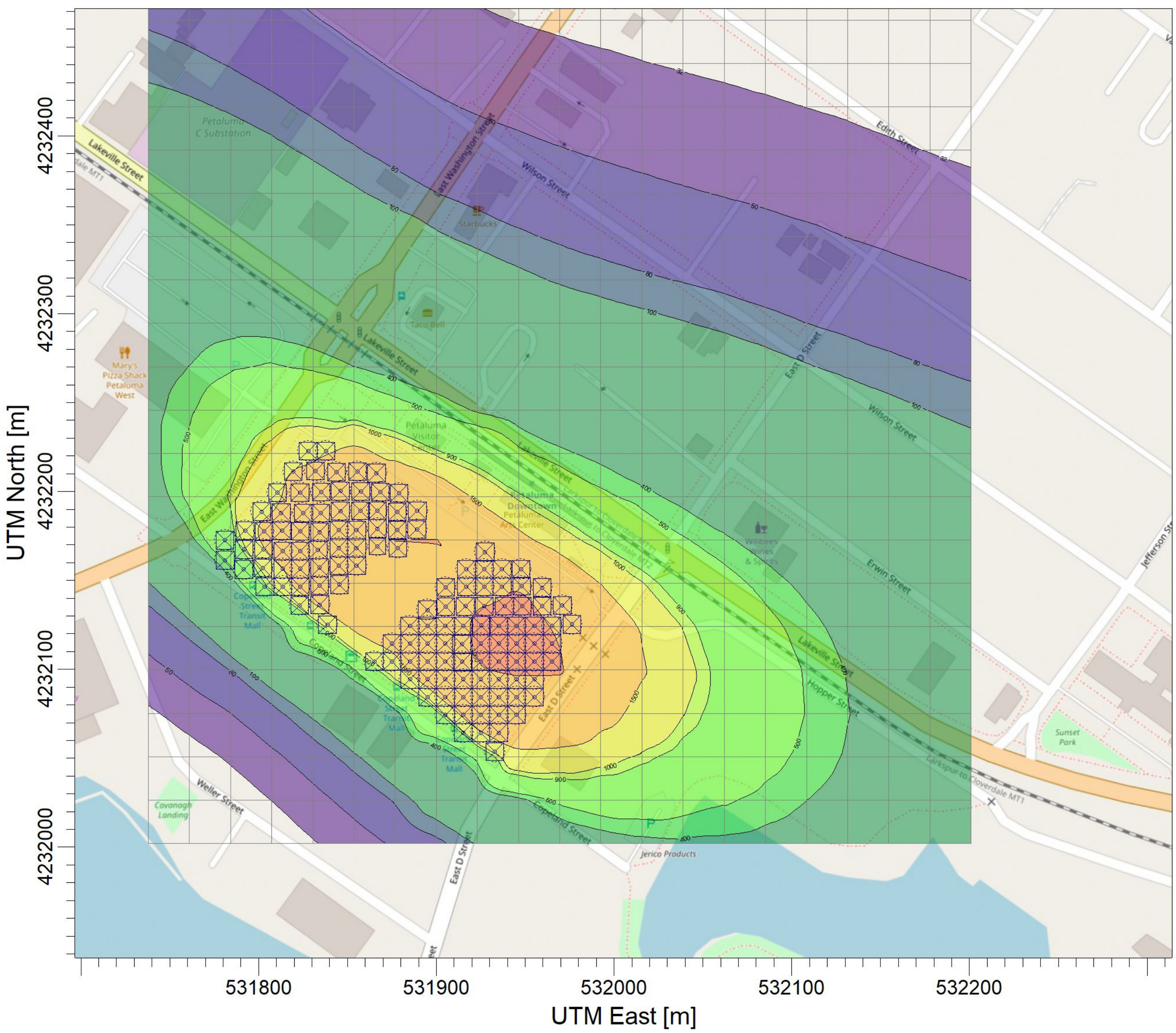
BASELINE ENVIRONMENTAL CONSULTING

APPENDIX C

AERMOD REPORT

PROJECT TITLE:

P:\Base\20302-00 WRA Smart Parcel Petaluma\AERMOD\AERMOD.isc



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m^3

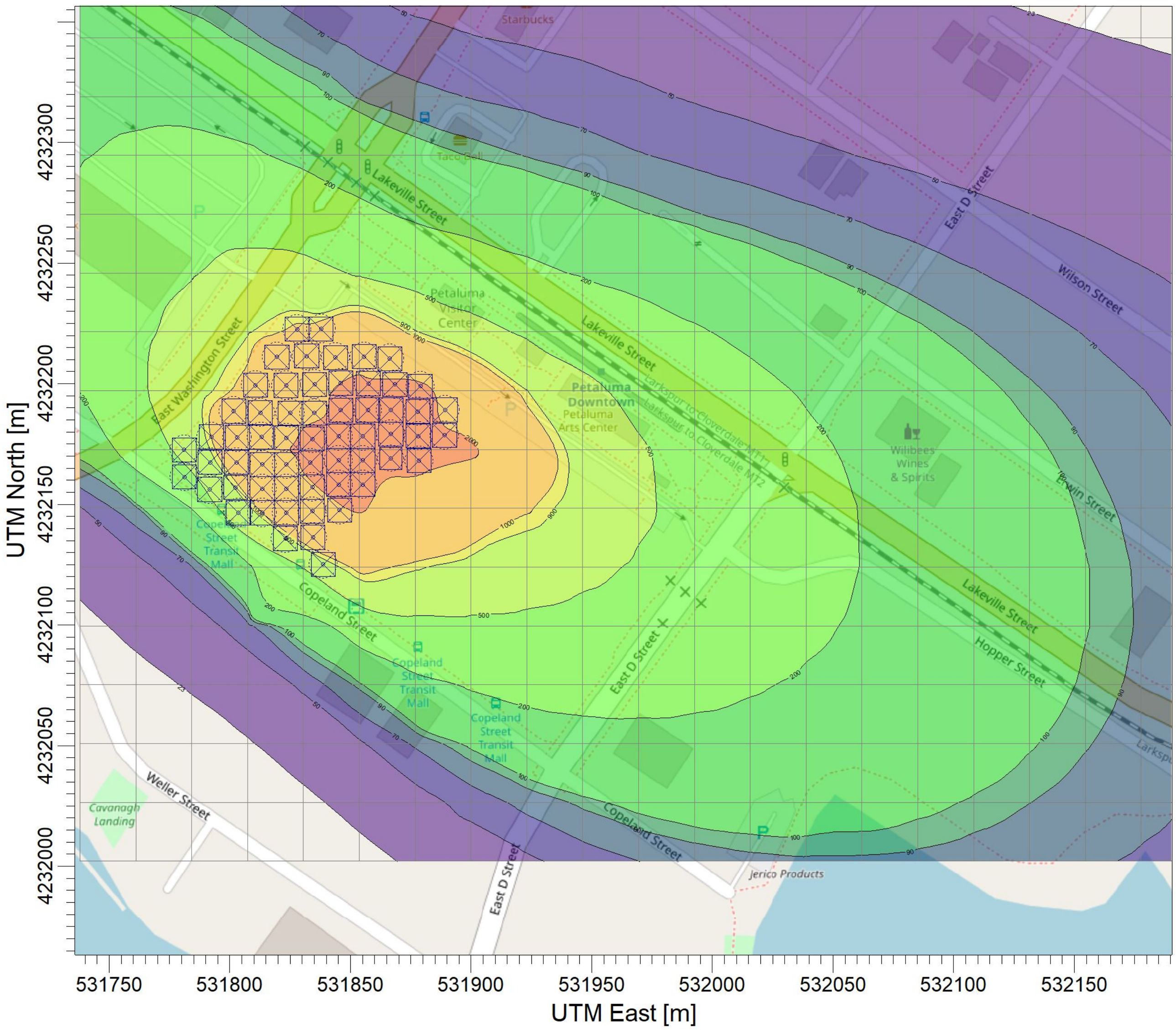
Max: 3244 [ug/m^3] at (531946.25, 4232124.00)

32 50 80 100 400 500 900 1000 1500 3000 3244

COMMENTS:	SOURCES: **133**	COMPANY NAME:	
	RECEPTORS: **441**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:3,883 (0 — 0.1 km)	
	MAX: **3244 ug/m^3**	DATE: **7/24/2020**	PROJECT NO.:

PROJECT TITLE:

P:\Base\20302-00 WRA Smart Parcel Petaluma\AERMOD\AERMOD.isc



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m^3

Max: 2308 [ug/m^3] at (531876.75, 4232172.50)

23 | 50 | 70 | 90 | 100 | 200 | 500 | 900 | 1000 | 2000 | 2308

COMMENTS: For Phase 1 Building MEIR	SOURCES: **59**	COMPANY NAME:	
	RECEPTORS: **441**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:2,860 0 — 0.1 km	
	MAX: **2308 ug/m^3**	DATE: **10/23/2020**	PROJECT NO.:

BASELINE
ENVIRONMENTAL CONSULTING

APPENDIX D

HEALTH RISK ASSESSMENT INPUT PARAMETERS AND RESULTS

Summary of Health Risk Assessment at Existing MEIR for DPM Emissions during Construction

Health Risk Assessment Parameters and Results				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		3rd Trimester	**0-2 Years**	
DPM Concentration (C)	μg/m^3	0.005	0.005	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	361	1090	95th percentile (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	mg-m^3/μg-L	0.000001	0.000001	Conversion of μg to mg and L to m^3
Dose	mg/kg/day	0.000002	0.000005	C*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	(mg/kg/day)$^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.25	2.50	Based on total construction period of 33 months
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	0.06	1.76	D*CPF*ASF*ED/AT*FAH*CF (OEHHA, 2015)
Total Cancer Risk	per million	1.82		At Existing MEIR location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	μg/m^3	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.00	At Existing MEIR location	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

μg/m^3 = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

(mg/kg/day)$^{-1}$ = 1/milligrams per kilograms per day

Existing MEIR = maximum exposed individual resident

Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February.*

Summary of Health Risk Assessment at Haystack MEIR for DPM Emissions during Construction

Health Risk Assessment Parameters and Results				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		3rd Trimester	**0-2 Years**	
DPM Concentration (C)	$\mu g/m^3$	0.014	0.014	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	361	1090	95th percentile (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	$mg\text{-}m^3/\mu g\text{-}L$	0.000001	0.000001	Conversion of µg to mg and L to m^3
Dose	mg/kg/day	0.000005	0.000014	C*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	$(mg/kg/day)^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.25	2.50	Based on total construction period of 33 months
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	0.16	4.73	D*CPF*ASF*ED/AT*FAH*CF (OEHHA, 2015)
Total Cancer Risk	per million	4.88		At Haystack MEIR location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	$\mu g/m^3$	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.00	At Haystack MEIR location	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

$\mu g/m^3$ = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

$(mg/kg/day)^{-1}$ = 1/milligrams per kilograms per day

Haystack MEIR = maximum exposed individual resident at the Haystack Project

Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February.*

Summary of Health Risk Assessment at MEIS for DPM Emissions during Construction

Health Risk Assessment Parameters and Results				
DPM Emissions without SCA-AIR-1				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		0-2 years	**2-9 Years**	
DPM Concentration (C)	$\mu g/m^3$	0.004	0.004	ISCST3 Annual Average
Worker Adjustment Factor (WAF)	unitless	4.2	4.2	OEHHA,2015 4-44 to 4-45
Daily Breathing Rate (DBR)	L/kg-8 Hr	1200	640	95th percentile, moderate intensity (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.68	0.7	250 days/365 days(OEHHA, 2015)
Dose Conversion Factor (CF_D)	$mg\text{-}m^3/\mu g\text{-}L$	0.000001	0.000001	Conversion of µg to mg and L to m^3
Dose	mg/kg/day	0.000015	0.000015	C*WAF*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	$(mg/kg/day)^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	1.50	1.25	Based on total construction period of 33 months
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	3.64	3.03	D*CPF*ASF*ED/AT*CF (OEHHA, 2015)
Total Cancer Risk	per million	6.67		At MEIS location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	$\mu g/m^3$	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.00	At MEIS location	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

$\mu g/m^3$ = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

$(mg/kg/day)^{-1}$ = 1/milligrams per kilograms per day

MEIS = maximum exposed individual student

Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February.*

Summary of Health Risk Assessment at Project Phase 1 MEIR for DPM Emissions during Construction				
Health Risk Assessment Parameters and Results				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		3rd Trimester	**0-2 Years**	
DPM Concentration (C)	μg/m^3	0.087	0.087	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	361	1090	95th percentile (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	mg-m^3/μg-L	0.000001	0.000001	Conversion of μg to mg and L to m^3
Dose	mg/kg/day	0.000030	0.000091	C*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	(mg/kg/day)$^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.25	0.33	7 months overlap with construction period
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	1.01	4.07	D*CPF*ASF*ED/AT*FAH*CF (OEHHA, 2015)
Total Cancer Risk	per million	5.08		At Project Phase 1 MEIR location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	μg/m^3	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.02	At Project Phase 1 MEIR location	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

μg/m^3 = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

(mg/kg/day)$^{-1}$ = 1/milligrams per kilograms per day

Project Phase 1 MEIR = maximum exposed individual resident at Building 1 of the project

Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February.*