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**Via Email:** [ahawkins@pacificacompanies.com](mailto:ahawkins@pacificacompanies.com)

**Subject: Haystack Pacifica Mixed Use Construction TAC & GHG Analysis –  
Petaluma, CA – Project 14-039**

Dear Abbie:

This letter reports the revised community risk assessment and greenhouse gas (GHG) emissions associated with the proposed Haystack Pacifica Mixed-Use Project in Petaluma, California. Previously, Illingworth & Rodkin, Inc. provided memorandums that reported greenhouse gas emissions and community risk impacts separately. The purpose of this letter is (1) to combined both reports, (2) update the analyses to include the most recent planned building sizes and corresponding traffic analysis, and (3) update the community risk assessment to add additional nearby sensitive receptors base results upon the AERMOD dispersion model (instead of the ISCST3 model).

The project is located in West Petaluma, on a largely vacant 4.10-acre site bordered by Washington, Copeland, D and Weller Streets. Compared to the May 2018 memorandum, the project's land uses increased slightly with more dwelling units and parking provided. The project would remain four stories high but would now include 178 mid-rise apartments and 24,855 square feet (SF) of retail space. The project would also provide 256 parking spaces in an enclosed parking facility. The project was modified to include the slight increase in land uses but it was assumed that the provided construction schedule and activity would not change.

### **Air Quality Setting**

The project is located in the Sonoma County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM10), and fine particulate matter (PM2.5).

### Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

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

### Toxic Air Contaminants

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

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

### Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. The closest sensitive receptors to the project site are

residences in apartments to the west-northwest of the project site. Other residences are located to the east and southwest of the project site.

### Significance Thresholds

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

**Table 1. BAAQMD Air Quality CEQA Significance Thresholds**

Health Risks and Hazards	Single Sources Within 1,000-foot Zone of Influence	Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)
Excess Cancer Risk	>10.0 per one million	>100 per one million
Hazard Index	>1.0	>10.0
Incremental annual PM <sub>2.5</sub>	>0.3 µg/m <sup>3</sup>	>0.8 µg/m <sup>3</sup>
<b>Greenhouse Gas Emissions</b>		
Land Use Projects – direct and indirect emissions		Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) and adjusted to 2.6 metric tons per capita (for 2030)*
Note: ROG = reactive organic gases, NO <sub>x</sub> = nitrogen oxides, PM <sub>10</sub> = coarse particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, PM <sub>2.5</sub> = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.		
*BAAQMD does not have a recommended post-2020 GHG threshold.		

## **Construction Community Health Risk Assessment**

### Project Construction Activity

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust are known as a TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to PM<sub>2.5</sub>. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects of sensitive receptors at these nearby residences from

construction emissions of DPM and PM<sub>2.5</sub>.<sup>1</sup> Dispersion modeling was conducted to predict the off-site concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

### CalEEMod Modeling

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from construction of the site assuming full build-out of the project. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The model output from CalEEMod is included as *Attachment 1*.

CalEEMod provided annual emissions for construction and estimates emissions for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and schedule, was based information provided by the project applicant. The proposed project land uses are as follows:

- 178 dwelling units entered as “Apartment Mid Rise”,
- 24,855-sf entered as “General Office Building”,
- 256 parking spaces entered as “Enclosed Parking with Elevator”,
- 100 tons of pavement hauled during demolition,
- 2,500 cubic yards of soil exported during grading,
- 400 round-trip cement hauling trips during building construction and
- 500 cubic yards of asphalt hauled during paving.

The CalEEMod model also provided total annual PM<sub>10</sub> exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.0994 tons (199 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive PM<sub>2.5</sub> dust emissions were calculated by CalEEMod as 0.13625 tons (273 pounds) for the overall construction period.

### Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and PM<sub>2.5</sub> concentrations at sensitive receptors (residences) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.<sup>2</sup> The modeling utilized two area sources to represent the on-site construction emissions, one for exhaust emissions and one

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<sup>1</sup> DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

<sup>2</sup> Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards*, Version 3.0. May.

for fugitive dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive PM<sub>2.5</sub> emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area source. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. to 7 p.m. per the project applicant's construction schedule.

The modeling used a five-year data set (2013-2017) of hourly meteorological data produced by Lakes Environmental Software for use with the AERMOD model. Annual DPM and PM<sub>2.5</sub> concentrations from construction activities during the 2020-2021 period were calculated using the model. DPM and PM<sub>2.5</sub> concentrations were calculated at nearby sensitive receptors. Receptor heights of 4.5 meters (15 feet) and 7.5 meters (25 feet) were used to represent the breathing heights of residents in nearby mixed-use buildings where the residences began on the second-floor.

### Community Risk Impacts

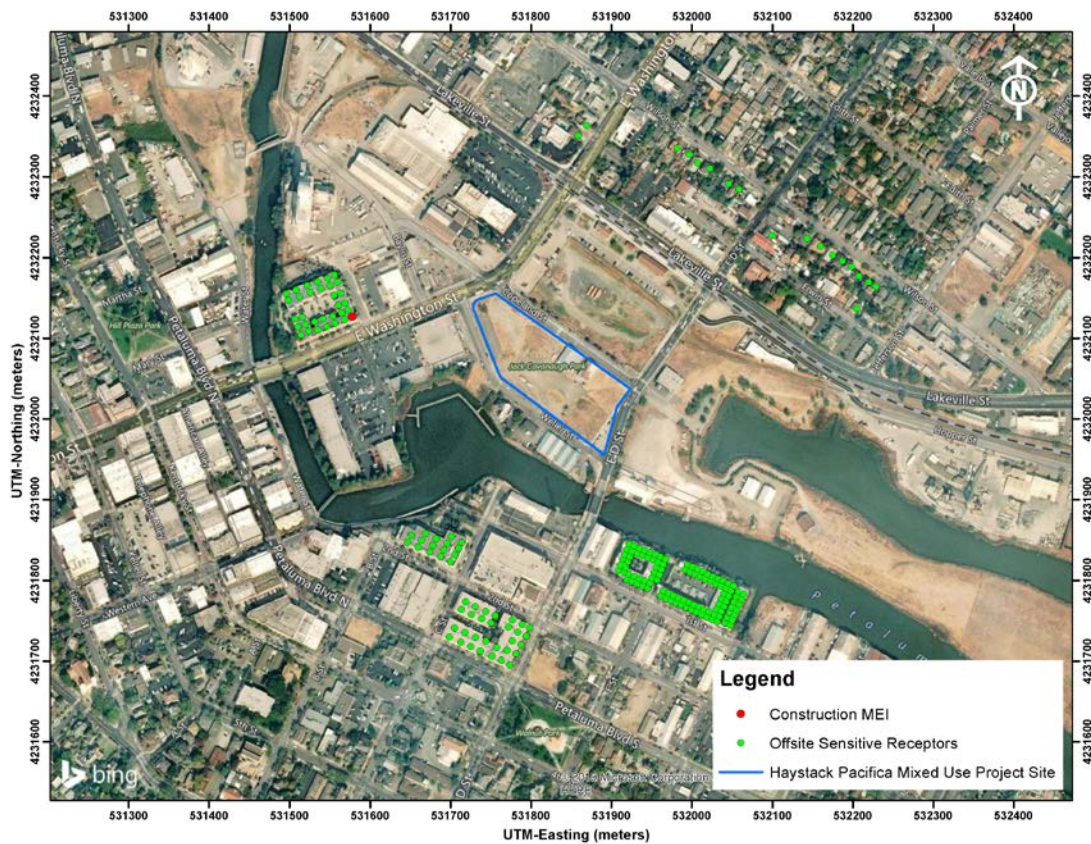
Figure 1 shows the locations where the maximum-modeled DPM and PM<sub>2.5</sub> concentrations occurred. The maximum concentrations occurred at the southeast corner of an apartment building on the second-floor (i.e. breathing height of 4.5 meters). The maximum increased cancer risk at the location of the maximally exposed individual (MEI) was calculated using the BAAQMD recommended methods and the maximum annual modeled DPM concentration. The cancer risk calculations are based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. BAAQMD-recommended exposure parameters were used for the cancer risk calculations, as described in *Attachment 2*. Infant and adult exposures were assumed to occur at all residences through the entire construction period. *Attachment 3* includes the construction emission calculations and source information used in the modeling and the cancer risk calculations.

Results of this assessment indicated that the unmitigated risks would not exceed the BAAQMD significance threshold for cancer risk, maximum annual PM<sub>2.5</sub> concentration nor the hazard index (HI). Table 2 summarizes the health risk impacts at the Construction MEI.

**Table 2. Construction Health Risks at the Construction MEI**

Source	Maximum Cancer Risk (per million)	PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> )	Hazard Index
Project Construction	1.8 (infant)	<b>0.02</b>	<0.01
<b><i>BAAQMD Single-Source Threshold</i></b>	<b>&gt;10.0</b>	<b>&gt;0.3</b>	<b>&gt;1.0</b>
<b><i>Significant?</i></b>	<i>No</i>	<i>No</i>	<i>No</i>

**Figure 1. Project Construction Site and Locations of Off-Site Sensitive Receptors and TAC Impacts**



### Cumulative Impact on Construction MEI

Cumulative community risk impacts were addressed through evaluation of sources located within 1,000 feet of the project site. Within this area, there is E. Washington, D Street, Lakeville Street, and two stationary sources of air pollutant or TAC emissions that affect the area. None of these sources are substantial enough such that the cumulative cancer risk would exceed 100 chances per million or the annual PM<sub>2.5</sub> concentration would exceed 0.08 $\mu\text{g}/\text{m}^3$ .

### **Greenhouse Gases**

#### Setting

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO<sub>2</sub>) and water vapor but there are also several others, most importantly methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO<sub>2</sub> and N<sub>2</sub>O are byproducts of fossil fuel combustion.
- N<sub>2</sub>O is associated with agricultural operations such as fertilization of crops.
- CH<sub>4</sub> is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO<sub>2</sub> being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO<sub>2</sub> equivalents (CO<sub>2</sub>e).

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

### Recent Regulatory Actions

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

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

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



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

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

*SB 350 Renewable Portfolio Standards*

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

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

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

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State's emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings (note that new
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities
- Greatly increase the number of electric vehicles on the road and reduce oil demand in



half;

- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce “super pollutants” by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

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

#### *City of Petaluma General Plan*

The City of Petaluma’s General Plan 2025, adopted in 2010, includes goals and policies addressing GHG emissions in Section 4.5 *Greenhouse Gas Emissions*.

Policy 4-P-24: Comply with AB 32 and its governing regulations to the full extent of the City’s jurisdictional authority.

Policy 4-P-25: To the full extent of the City’s jurisdictional authority, implement any additional adopted State legislative or regulatory standards, policies and practices designed to reduce greenhouse gas emissions, as those measures are developed.

Policy 4-P-26: Implement all measures identified in the municipal Climate Action Plan to meet the municipal target set in Resolution 2005-118 (20% below 2000 levels by 2010).

Policy 4-P-30: Continue to monitor new technology and innovative sustainable design practices for applicability to insure future development minimizes or eliminates the use of fossil fuel and GHG-emitting energy consumption

The City of Petaluma’s Greenhouse Gas Emissions Reduction Action Plan addresses emissions from municipal government activities and sources per Resolution 2002-117. The purpose of the plan is to identify and prioritize programs, projects, and procedural policies that will help the City government achieve the municipal GHG emission goals of Resolution 2005-118 by more than 20 percent below 2000 levels by 2015. The plan does not apply to land development projects.

The Sonoma County Regional Climate Action Plan, developed in 2016, includes 2020 GHG emission reduction measures for Petaluma<sup>3</sup>. This plan is an advisory document that the City uses to assist in achieving reduction of GHG emissions. Development projects within the City of Petaluma are encouraged to comply with the intent of the Climate Action Plan and realize GHG reductions through voluntary application of reduction measures. The reduction measures are categorized by goals for State and Regional Measures and then by Local Measures. Under a

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<sup>3</sup> Sonoma County Regional Climate Protection Authority. 2016. *Climate Action 2020 and Beyond*. July.

Business as Usual scenario, emissions in Petaluma would be 542,970 metric tons (MT) in 2020. State measures (e.g., vehicle reduction, cap and trade, renewable portfolios) would reduce these emissions by 119,660 MT. Regional measures are anticipated to reduce emissions by another 28,200 MT and Local Measures would reduce emissions by 18,490 MT. Under this plan, Petaluma's GHG emissions would be reduced to 376,620 MT in 2020. These emissions would be 31 percent below business as usual projection and below estimated 1990 emission of 387,020 MT.

### GHG Significance Thresholds

For quantified emissions, the BAAQMD guidelines recommended a GHG threshold of 1,100 metric tons or 4.6 metric tons (MT) per capita. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur beyond 2020, so a threshold that addresses a future target is appropriate. Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO<sub>2e</sub>/year/service population and a bright-line threshold of 660 MT CO<sub>2e</sub>/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on a 40-percent reduction of the 2020 threshold recommended by BAAQMD that is assumed to be equivalent to the 1990 emission level. The 2030 bright-line threshold is also a 40 percent reduction of the 2020 1,100 MT CO<sub>2e</sub>/year threshold.

### CalEEMod Modeling

CalEEMod was used to predict GHG emissions from operation of the site assuming full build-out of the project. The project land use types and size and other project-specific information were input to the model, as described below. CalEEMod output is included in *Attachment 1*.

#### *Trip Generation Rates*

CalEEMod allows the user to enter specific vehicle trip generation rates, which were input to the model using the daily trip generation rate provided in the project trip generation table. Usually, the Saturday and Sunday trip rates were assumed to be the weekday rate adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips.

The project applicant provided project trip generation values for the general light industry facility.<sup>4</sup> The weekday trip rate used for the project was 4.11, which was based on 732 trips divided by 178 dwelling units. This changed the Saturday trip rate to 3.95 trips per day and the Sunday trip rate to 3.62 trips per day.

#### *Model Year*

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the

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<sup>4</sup> W-Trans. 2019. *Traffic Impact Study for the Haystack Pacific Project*. March

model, the higher the emission rates utilized by CalEEMod. To be consistent with past reports, it was assumed that the project would be fully operational in the year 2020.

### *Energy*

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. Indirect emissions from electricity were computed in CalEEMod. The model has a default rate of 641.3 pounds of CO<sub>2</sub> per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. The rate was adjusted to account for PG&E's projected 2020 CO<sub>2</sub> intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO<sub>2</sub> per megawatt of electricity delivered.<sup>5</sup>

### *Other Inputs*

Default model assumptions for GHG emissions associated with area sources, solid waste generation and water/wastewater use were applied to the project.

### Service Population Emissions

The project service population efficiency rate is based on the number of future residents and future employees. For this project, the number of future residents was estimated by multiplying the total number of units by the persons per household rate for Petaluma found in the California Department of Finance Population and Housing Estimate report.<sup>6</sup> Using the 2.72 persons per household 2018 estimate for Petaluma, the number of future residents was estimated to be 484 individuals. The total future population used to calculate the per capita emissions would be 484 residents.

### Construction GHG Emissions

GHG emissions associated with construction were computed to be 347 MT of CO<sub>2</sub>e, anticipated to occur over the entire construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted Threshold of Significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable.

### Operational GHG Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate daily emissions associated with operation of the fully-developed site under the proposed project. As shown in Table 3, annual emissions resulting from operation of the proposed project are predicted to be 1,164 MT of CO<sub>2</sub>e for the year 2020 and 982 MT of CO<sub>2</sub>e for the year 2030. The

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<sup>5</sup> Pacific Gas & Electric, 2015. *Greenhouse Gas Emission Factors: Guidance for PG&E Customers*. November.

<sup>6</sup> State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011-2018*. Sacramento, California, May 2018.

Service Population Emissions for the year 2020 would be 2.4 MT CO<sub>2e</sub>/year/service population and 2.0 MT CO<sub>2e</sub>/year/service population for the year 2030.

To be considered significant, the project must exceed both the GHG significance threshold in metric tons per year and the service population significance threshold. Both the 2020 and 2030 GHG emissions do not exceed either the metric ton significance threshold or the per capita significance threshold for their respective years. Therefore, the project would have a *less-than-significant* impact regarding GHG emissions.

**Table 3. Annual GHG Emissions (CO<sub>2e</sub>) in Metric Tons & Per Capita**

Source Category	Proposed Project in 2020	Proposed Project in 2030
Area	9	9
Energy Consumption	340	338
Mobile	736	561
Solid Waste Generation	53	53
Water Usage	26	21
Total	<b>1,164</b>	<b>982</b>
<i>Significance Threshold</i>	<i>1,100 MT CO<sub>2e</sub>/year</i>	<i>660 MT CO<sub>2e</sub>/year</i>
Service Population Emissions (MT CO <sub>2e</sub> /year/service population)	<b>2.4</b>	<b>2.0</b>
<i>Significance Threshold</i>	<i>4.6 in 2020</i>	<i>2.8 in 2030</i>
<i>Significant (Exceeds both thresholds)?</i>		<b>No</b>

\* \* \*

This concludes our assessment of the construction health risk impacts and the GHG emissions associated with the proposed Haystack Pacifica Mixed Use Project. Please feel free to contact us with any questions or if you need additional information.

Sincerely,

James A. Reyff  
Principal Consultant  
***Illingworth & Rodkin, Inc.***  
14-039

Attachments

## **Attachment 1: CalEEMod Model Outputs**

Project Name: Haystack								Complete ALL Portions in Yellow
See Equipment Type TAB for type, horsepower and load factor								
Project Size		174 Dwelling Units		1.59 total project acres disturbed				
		170182 s.f. residential						
		N/A s.f. retail						
		22999 s.f. office/commercial						
		N/A s.f. other, specify:						
		73907 s.f. parking garage		219 spaces				
		N/A s.f. parking lot		N/A spaces				
Construction Hours		7:00 am to		7:00 pm				
Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
	Demolition	Start Date:	1/2/2018	Total phase:	20			Overall Import/Export Volumes
		End Date:	2/1/2018					
	Concrete/Industrial Saws	81	0.73			0	0	Demolition Volume
	Excavators	162	0.38	8	5	2	0	Square footage of buildings to be demolished
	Rubber-Tired Dozers	255	0.4	8	5	2	0	(or total tons to be hauled)
	Tractors/Loaders/Backhoes	97	0.37	8	5	2	0	? square feet or
								Hauling volume (tons)
	Site Preperation	Start Date:	1/10/2018	Total phase:	2			Any pavement demolished and hauled? 100 tons
		End Date:	2/15/2018					
	Graders	174	0.41	8	20	80	0	
	Rubber Tired Dozers	255	0.4	8	20	80	0	
	Tractors/Loaders/Backhoes	97	0.37	8	20	80	0	
	Grading / Excavation	Start Date:	1/10/2018	Total phase:	4			
		End Date:	2/10/2018					Soil Hauling Volume
	Excavators	162	0.38	8	20	40	0	Export volume = 2500 cubic yards?
	Graders	174	0.41	8	20	40	0	Import volume = 0 cubic yards?
	Rubber Tired Dozers	255	0.4	8	20	40	0	
	Tractors/Loaders/Backhoes	97	0.37	8	20	40	0	
	Other Equipment?							
	Trenching	Start Date:	2/10/2018	Total phase:	10			
		End Date:	5/10/2018					
	Tractor/Loader/Backhoe	97	0.37	8	66	52.8	0	
	Excavators	162	0.38	8	66	52.8		
	Other Equipment?							
	Building - Exterior	Start Date:	5/10/2018	Total phase:	200			Cement Trucks? 400 Total Round-Trips
		End Date:	9/10/2018					
	Cranes	226	0.29	8	15	0.6	0	Electric? (Y/N) Otherwise assumed diesel
	Forklifts	89	0.2	8	88	3.52	0	Liquid Propane (LPG)? (Y/N) Otherwise Assumed diesel
	Generator Sets	84	0.74			0	0	Or temporary line power? (Y/N)
	Tractors/Loaders/Backhoes	97	0.37			0	0	
	Welders	46	0.45			0	0	
	Other Equipment?					0		
	Building - Interior/Architectural Coating	Start Date:	9/10/2018	Total phase:	10			
		End Date:	2/10/2019					
	Air Compressors	78	0.48	8	110	88	0	
	Aerial Lift	62	0.31	8	110	88	0	
	Other Equipment?							
	Paving	Start Date:	2/10/2019	Total phase:	10			Asphalt? 500 cubic yards or round trips?
		Start Date:	3/10/2019					
	Cement and Mortar Mixers	9	0.56	8	22	17.6	0	
	Pavers	125	0.42	8	22	17.6	0	
	Paving Equipment	130	0.36	8	22	17.6	0	
	Rollers	80	0.38	8	22	17.6	0	
	Tractors/Loaders/Backhoes	97	0.37	8	22	17.6	0	
	Other Equipment?							

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

## Haystack, Petaluma, AQ

### Sonoma-San Francisco County, Annual

## 1.0 Project Characteristics

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### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	24.86	1000sqft	0.00	24,855.00	0
Enclosed Parking with Elevator	256.00	Space	0.00	102,400.00	0
Apartments Mid Rise	178.00	Dwelling Unit	4.10	172,686.00	509

### 1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	75
Climate Zone	4			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

### 1.3 User Entered Comments & Non-Default Data



## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Project Characteristics - PG&E 2020 rate

Land Use - Land Uses: 178 dwelling units, 256 parking spaces, and 24,855-sf of commercial

Construction Phase - Applicant provided construction schedule. Using the Total Work Days provided for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Trips and VMT - 800 cement truck trips (400 round trips)

Paving trips=  $500/16 \times 2 \sim 64$  trips

TAC Trip Length 1 mile

Demolition - 100 tons of pavement demolished

Grading - 2500 cubic yards soil export

Architectural Coating -

Vehicle Trips - Using project trip generation rate, (732 trips/178 units) = weekday 4.11, Saturday 3.95, Sunday 3.62

Woodstoves - NG fireplaces = 57

Energy Use -

Water And Wastewater - All WTP treatment

Solid Waste -

Construction Off-road Equipment Mitigation - BMPS, Tier 3

Area Mitigation -

Energy Mitigation -

Water Mitigation -

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Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	18.00	110.00

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tblConstructionPhase	NumDays	230.00	88.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	22.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	PhaseEndDate	2/22/2019	2/8/2019
tblConstructionPhase	PhaseEndDate	1/3/2019	9/10/2018
tblConstructionPhase	PhaseEndDate	1/29/2018	1/8/2018
tblConstructionPhase	PhaseEndDate	2/15/2018	2/6/2018
tblConstructionPhase	PhaseEndDate	1/29/2019	3/12/2019
tblConstructionPhase	PhaseEndDate	2/5/2018	2/6/2018
tblConstructionPhase	PhaseStartDate	1/30/2019	9/10/2018
tblConstructionPhase	PhaseStartDate	2/16/2018	5/10/2018
tblConstructionPhase	PhaseStartDate	2/6/2018	1/10/2018
tblConstructionPhase	PhaseStartDate	1/4/2019	2/10/2019
tblConstructionPhase	PhaseStartDate	1/30/2018	1/10/2018
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	26.70	57.00
tblFireplaces	NumberWood	30.26	0.00
tblGrading	MaterialExported	0.00	2,500.00
tblLandUse	LandUseSquareFeet	24,860.00	24,855.00
tblLandUse	LandUseSquareFeet	178,000.00	172,686.00
tblLandUse	LotAcreage	0.57	0.00
tblLandUse	LotAcreage	2.30	0.00
tblLandUse	LotAcreage	4.68	4.10
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.41	0.41

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tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	1.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	313.00	312.00
tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblVehicleTrips	ST_TR	6.39	3.95
tblVehicleTrips	ST_TR	2.46	0.00

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tblVehicleTrips	SU_TR	5.86	3.62
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	6.65	4.11
tblVehicleTrips	WD_TR	11.03	0.00
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
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

## 2.0 Emissions Summary

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## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.2286	2.0070	1.5064	3.3400e-003	0.3510	0.0904	0.4414	0.1602	0.0839	0.2442	0.0000	308.2867	308.2867	0.0507	0.0000	309.5530
2019	0.3869	0.2257	0.2438	4.2000e-004	6.3500e-003	0.0123	0.0186	1.7000e-003	0.0115	0.0132	0.0000	37.0903	37.0903	8.2200e-003	0.0000	37.2958
Maximum	1.2286	2.0070	1.5064	3.3400e-003	0.3510	0.0904	0.4414	0.1602	0.0839	0.2442	0.0000	308.2867	308.2867	0.0507	0.0000	309.5530

**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.1163	1.2749	1.5811	3.3400e-003	0.2120	0.0483	0.2604	0.0566	0.0481	0.1047	0.0000	308.2866	308.2866	0.0507	0.0000	309.5528
2019	0.3719	0.1718	0.2616	4.2000e-004	6.3500e-003	9.7500e-003	0.0161	1.7000e-003	9.7400e-003	0.0114	0.0000	37.0903	37.0903	8.2200e-003	0.0000	37.2957
Maximum	1.1163	1.2749	1.5811	3.3400e-003	0.2120	0.0483	0.2604	0.0566	0.0481	0.1047	0.0000	308.2866	308.2866	0.0507	0.0000	309.5528

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	7.88	35.20	-5.28	0.00	38.89	43.42	39.90	64.01	39.35	54.86	0.00	0.00	0.00	0.00	0.00	0.00

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2018	4-1-2018	1.2168	0.5765
2	4-2-2018	7-1-2018	0.4163	0.3281
3	7-2-2018	10-1-2018	0.6553	0.5685
4	10-2-2018	1-1-2019	0.9551	0.9239
5	1-2-2019	4-1-2019	0.5879	0.5194
		Highest	1.2168	0.9239

## 2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2798	9.2798	2.2600e-003	1.3000e-004	9.3750
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	337.6677	337.6677	0.0254	6.7400e-003	340.3112
Mobile	0.2649	1.3016	2.9451	8.0200e-003	0.6130	0.0108	0.6238	0.1650	0.0102	0.1752	0.0000	735.6211	735.6211	0.0345	0.0000	736.4846
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	5.6664	16.0126	21.6791	0.0211	0.0127	25.9775
<b>Total</b>	<b>1.2315</b>	<b>1.4139</b>	<b>4.3233</b>	<b>8.7000e-003</b>	<b>0.6130</b>	<b>0.0259</b>	<b>0.6388</b>	<b>0.1650</b>	<b>0.0252</b>	<b>0.1902</b>	<b>26.9805</b>	<b>1,098.5811</b>	<b>1,125.5616</b>	<b>1.3429</b>	<b>0.0195</b>	<b>1,164.9530</b>



## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**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	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2798	9.2798	2.2600e-003	1.3000e-004	9.3750
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	335.1820	335.1820	0.0251	6.6900e-003	337.8040
Mobile	0.2649	1.3016	2.9451	8.0200e-003	0.6130	0.0108	0.6238	0.1650	0.0102	0.1752	0.0000	735.6211	735.6211	0.0345	0.0000	736.4846
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	4.5332	13.4513	17.9844	0.0170	0.0101	21.4288
<b>Total</b>	<b>1.2315</b>	<b>1.4139</b>	<b>4.3233</b>	<b>8.7000e-003</b>	<b>0.6130</b>	<b>0.0259</b>	<b>0.6388</b>	<b>0.1650</b>	<b>0.0252</b>	<b>0.1902</b>	<b>25.8472</b>	<b>1,093.534 2</b>	<b>1,119.381 4</b>	<b>1.3385</b>	<b>0.0170</b>	<b>1,157.897 1</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>4.20</b>	<b>0.46</b>	<b>0.55</b>	<b>0.33</b>	<b>13.11</b>	<b>0.61</b>

**3.0 Construction Detail****Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2018	1/8/2018	5	5	
2	Site Preparation	Site Preparation	1/10/2018	2/6/2018	5	20	
3	Grading	Grading	1/10/2018	2/6/2018	5	20	
4	Trenching	Trenching	2/10/2018	5/14/2018	5	66	
5	Building Construction	Building Construction	5/10/2018	9/10/2018	5	88	
6	Architectural Coating	Architectural Coating	9/10/2018	2/8/2019	5	110	
7	Paving	Paving	2/10/2019	3/12/2019	5	22	

**Acres of Grading (Site Preparation Phase): 10**

**Acres of Grading (Grading Phase): 10**

**Acres of Paving: 0**

**Residential Indoor: 349,689; Residential Outdoor: 116,563; Non-Residential Indoor: 37,283; Non-Residential Outdoor: 12,428; Striped Parking Area: 6,144 (Architectural Coating – sqft)**

**OffRoad Equipment**

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	1.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	0	0.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	63	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	2	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	10.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	312.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	179.00	40.00	800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	36.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	64.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

**3.1 Mitigation Measures Construction**

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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**3.2 Demolition - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0700e-003	0.0000	1.0700e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0926	0.0523	9.0000e-005		4.6400e-003	4.6400e-003		4.2700e-003	4.2700e-003	0.0000	8.1434	8.1434	2.5400e-003	0.0000	8.2067
<b>Total</b>	<b>8.6600e-003</b>	<b>0.0926</b>	<b>0.0523</b>	<b>9.0000e-005</b>	<b>1.0700e-003</b>	<b>4.6400e-003</b>	<b>5.7100e-003</b>	<b>1.6000e-004</b>	<b>4.2700e-003</b>	<b>4.4300e-003</b>	<b>0.0000</b>	<b>8.1434</b>	<b>8.1434</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2067</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7200e-003	3.5000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3937	0.3937	3.0000e-005	0.0000	0.3943
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.6400e-003	0.0000	2.9000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2881	0.2881	1.0000e-005	0.0000	0.2884
<b>Total</b>	<b>2.6000e-004</b>	<b>1.8900e-003</b>	<b>1.9900e-003</b>	<b>0.0000</b>	<b>3.7000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.6818</b>	<b>0.6818</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.6828</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.2 Demolition - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.8000e-004	0.0000	4.8000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0430	0.0579	9.0000e-005		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	8.1434	8.1434	2.5400e-003	0.0000	8.2067
<b>Total</b>	<b>2.1900e-003</b>	<b>0.0430</b>	<b>0.0579</b>	<b>9.0000e-005</b>	<b>4.8000e-004</b>	<b>1.9600e-003</b>	<b>2.4400e-003</b>	<b>4.0000e-005</b>	<b>1.9600e-003</b>	<b>2.0000e-003</b>	<b>0.0000</b>	<b>8.1434</b>	<b>8.1434</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2067</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7200e-003	3.5000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3937	0.3937	3.0000e-005	0.0000	0.3943
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.6400e-003	0.0000	2.9000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2881	0.2881	1.0000e-005	0.0000	0.2884
<b>Total</b>	<b>2.6000e-004</b>	<b>1.8900e-003</b>	<b>1.9900e-003</b>	<b>0.0000</b>	<b>3.7000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.6818</b>	<b>0.6818</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.6828</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.3 Site Preparation - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1860	0.0000	0.1860	0.0999	0.0000	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5530	0.2439	4.5000e-004		0.0281	0.0281		0.0258	0.0258	0.0000	40.8182	40.8182	0.0127	0.0000	41.1359
<b>Total</b>	<b>0.0508</b>	<b>0.5530</b>	<b>0.2439</b>	<b>4.5000e-004</b>	<b>0.1860</b>	<b>0.0281</b>	<b>0.2141</b>	<b>0.0999</b>	<b>0.0258</b>	<b>0.1257</b>	<b>0.0000</b>	<b>40.8182</b>	<b>40.8182</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1359</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.9000e-004	8.7600e-003	2.0000e-005	1.5700e-003	1.0000e-005	1.5800e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5365	1.5365	7.0000e-005	0.0000	1.5383
<b>Total</b>	<b>1.1400e-003</b>	<b>8.9000e-004</b>	<b>8.7600e-003</b>	<b>2.0000e-005</b>	<b>1.5700e-003</b>	<b>1.0000e-005</b>	<b>1.5800e-003</b>	<b>4.2000e-004</b>	<b>1.0000e-005</b>	<b>4.3000e-004</b>	<b>0.0000</b>	<b>1.5365</b>	<b>1.5365</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>1.5383</b>



## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.3 Site Preparation - 2018****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					0.0837	0.0000	0.0837	0.0225	0.0000	0.0225	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0109	0.2219	0.2647	4.5000e-004		0.0107	0.0107		0.0107	0.0107	0.0000	40.8181	40.8181	0.0127	0.0000	41.1358
<b>Total</b>	<b>0.0109</b>	<b>0.2219</b>	<b>0.2647</b>	<b>4.5000e-004</b>	<b>0.0837</b>	<b>0.0107</b>	<b>0.0943</b>	<b>0.0225</b>	<b>0.0107</b>	<b>0.0331</b>	<b>0.0000</b>	<b>40.8181</b>	<b>40.8181</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1358</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.9000e-004	8.7600e-003	2.0000e-005	1.5700e-003	1.0000e-005	1.5800e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5365	1.5365	7.0000e-005	0.0000	1.5383
<b>Total</b>	<b>1.1400e-003</b>	<b>8.9000e-004</b>	<b>8.7600e-003</b>	<b>2.0000e-005</b>	<b>1.5700e-003</b>	<b>1.0000e-005</b>	<b>1.5800e-003</b>	<b>4.2000e-004</b>	<b>1.0000e-005</b>	<b>4.3000e-004</b>	<b>0.0000</b>	<b>1.5365</b>	<b>1.5365</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>1.5383</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.4 Grading - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0657	0.0000	0.0657	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.3067	0.1658	3.0000e-004		0.0155	0.0155		0.0143	0.0143	0.0000	27.1069	27.1069	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>0.0277</b>	<b>0.3067</b>	<b>0.1658</b>	<b>3.0000e-004</b>	<b>0.0657</b>	<b>0.0155</b>	<b>0.0812</b>	<b>0.0337</b>	<b>0.0143</b>	<b>0.0480</b>	<b>0.0000</b>	<b>27.1069</b>	<b>27.1069</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5700e-003	0.0536	0.0108	1.3000e-004	2.5900e-003	2.9000e-004	2.8800e-003	7.1000e-004	2.8000e-004	9.9000e-004	0.0000	12.2840	12.2840	7.8000e-004	0.0000	12.3035
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	8.6000e-004	6.7000e-004	6.5700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1524	1.1524	5.0000e-005	0.0000	1.1537
<b>Total</b>	<b>2.4300e-003</b>	<b>0.0542</b>	<b>0.0174</b>	<b>1.4000e-004</b>	<b>3.7700e-003</b>	<b>3.0000e-004</b>	<b>4.0700e-003</b>	<b>1.0200e-003</b>	<b>2.9000e-004</b>	<b>1.3100e-003</b>	<b>0.0000</b>	<b>13.4364</b>	<b>13.4364</b>	<b>8.3000e-004</b>	<b>0.0000</b>	<b>13.4572</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.4 Grading - 2018****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					0.0296	0.0000	0.0296	7.5800e-003	0.0000	7.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2600e-003	0.1484	0.1899	3.0000e-004		7.5600e-003	7.5600e-003		7.5600e-003	7.5600e-003	0.0000	27.1068	27.1068	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>7.2600e-003</b>	<b>0.1484</b>	<b>0.1899</b>	<b>3.0000e-004</b>	<b>0.0296</b>	<b>7.5600e-003</b>	<b>0.0371</b>	<b>7.5800e-003</b>	<b>7.5600e-003</b>	<b>0.0151</b>	<b>0.0000</b>	<b>27.1068</b>	<b>27.1068</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5700e-003	0.0536	0.0108	1.3000e-004	2.5900e-003	2.9000e-004	2.8800e-003	7.1000e-004	2.8000e-004	9.9000e-004	0.0000	12.2840	12.2840	7.8000e-004	0.0000	12.3035
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	8.6000e-004	6.7000e-004	6.5700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1524	1.1524	5.0000e-005	0.0000	1.1537
<b>Total</b>	<b>2.4300e-003</b>	<b>0.0542</b>	<b>0.0174</b>	<b>1.4000e-004</b>	<b>3.7700e-003</b>	<b>3.0000e-004</b>	<b>4.0700e-003</b>	<b>1.0200e-003</b>	<b>2.9000e-004</b>	<b>1.3100e-003</b>	<b>0.0000</b>	<b>13.4364</b>	<b>13.4364</b>	<b>8.3000e-004</b>	<b>0.0000</b>	<b>13.4572</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.5 Trenching - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.1891	0.1854	2.7000e-004		0.0111	0.0111		0.0102	0.0102	0.0000	24.9583	24.9583	7.7700e-003	0.0000	25.1525
<b>Total</b>	<b>0.0183</b>	<b>0.1891</b>	<b>0.1854</b>	<b>2.7000e-004</b>		<b>0.0111</b>	<b>0.0111</b>		<b>0.0102</b>	<b>0.0102</b>	<b>0.0000</b>	<b>24.9583</b>	<b>24.9583</b>	<b>7.7700e-003</b>	<b>0.0000</b>	<b>25.1525</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.3000e-004	7.2300e-003	1.0000e-005	1.2900e-003	1.0000e-005	1.3100e-003	3.4000e-004	1.0000e-005	3.6000e-004	0.0000	1.2677	1.2677	6.0000e-005	0.0000	1.2691
<b>Total</b>	<b>9.4000e-004</b>	<b>7.3000e-004</b>	<b>7.2300e-003</b>	<b>1.0000e-005</b>	<b>1.2900e-003</b>	<b>1.0000e-005</b>	<b>1.3100e-003</b>	<b>3.4000e-004</b>	<b>1.0000e-005</b>	<b>3.6000e-004</b>	<b>0.0000</b>	<b>1.2677</b>	<b>1.2677</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.2691</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.5 Trenching - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7100e-003	0.1385	0.2069	2.7000e-004		7.9300e-003	7.9300e-003		7.9300e-003	7.9300e-003	0.0000	24.9583	24.9583	7.7700e-003	0.0000	25.1525
<b>Total</b>	<b>6.7100e-003</b>	<b>0.1385</b>	<b>0.2069</b>	<b>2.7000e-004</b>		<b>7.9300e-003</b>	<b>7.9300e-003</b>		<b>7.9300e-003</b>	<b>7.9300e-003</b>	<b>0.0000</b>	<b>24.9583</b>	<b>24.9583</b>	<b>7.7700e-003</b>	<b>0.0000</b>	<b>25.1525</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.3000e-004	7.2300e-003	1.0000e-005	1.2900e-003	1.0000e-005	1.3100e-003	3.4000e-004	1.0000e-005	3.6000e-004	0.0000	1.2677	1.2677	6.0000e-005	0.0000	1.2691
<b>Total</b>	<b>9.4000e-004</b>	<b>7.3000e-004</b>	<b>7.2300e-003</b>	<b>1.0000e-005</b>	<b>1.2900e-003</b>	<b>1.0000e-005</b>	<b>1.3100e-003</b>	<b>3.4000e-004</b>	<b>1.0000e-005</b>	<b>3.6000e-004</b>	<b>0.0000</b>	<b>1.2677</b>	<b>1.2677</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.2691</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.6 Building Construction - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.2454	0.1738	2.3000e-004		0.0182	0.0182		0.0168	0.0168	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>0.0267</b>	<b>0.2454</b>	<b>0.1738</b>	<b>2.3000e-004</b>		<b>0.0182</b>	<b>0.0182</b>		<b>0.0168</b>	<b>0.0168</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0300e-003	0.1374	0.0278	3.2000e-004	6.6400e-003	7.5000e-004	7.3900e-003	1.8200e-003	7.2000e-004	2.5400e-003	0.0000	31.4974	31.4974	2.0000e-003	0.0000	31.5475
Vendor	0.0101	0.2466	0.0690	4.8000e-004	0.0114	2.1700e-003	0.0136	3.3000e-003	2.0700e-003	5.3700e-003	0.0000	45.8582	45.8582	3.1400e-003	0.0000	45.9368
Worker	0.0451	0.0350	0.3451	6.7000e-004	0.0618	5.4000e-004	0.0624	0.0165	5.0000e-004	0.0170	0.0000	60.5091	60.5091	2.6900e-003	0.0000	60.5765
<b>Total</b>	<b>0.0592</b>	<b>0.4190</b>	<b>0.4419</b>	<b>1.4700e-003</b>	<b>0.0799</b>	<b>3.4600e-003</b>	<b>0.0833</b>	<b>0.0216</b>	<b>3.2900e-003</b>	<b>0.0249</b>	<b>0.0000</b>	<b>137.8647</b>	<b>137.8647</b>	<b>7.8300e-003</b>	<b>0.0000</b>	<b>138.0607</b>

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**3.6 Building Construction - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7500e-003	0.1286	0.1702	2.3000e-004		8.5300e-003	8.5300e-003		8.5300e-003	8.5300e-003	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>5.7500e-003</b>	<b>0.1286</b>	<b>0.1702</b>	<b>2.3000e-004</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0300e-003	0.1374	0.0278	3.2000e-004	6.6400e-003	7.5000e-004	7.3900e-003	1.8200e-003	7.2000e-004	2.5400e-003	0.0000	31.4974	31.4974	2.0000e-003	0.0000	31.5475
Vendor	0.0101	0.2466	0.0690	4.8000e-004	0.0114	2.1700e-003	0.0136	3.3000e-003	2.0700e-003	5.3700e-003	0.0000	45.8582	45.8582	3.1400e-003	0.0000	45.9368
Worker	0.0451	0.0350	0.3451	6.7000e-004	0.0618	5.4000e-004	0.0624	0.0165	5.0000e-004	0.0170	0.0000	60.5091	60.5091	2.6900e-003	0.0000	60.5765
<b>Total</b>	<b>0.0592</b>	<b>0.4190</b>	<b>0.4419</b>	<b>1.4700e-003</b>	<b>0.0799</b>	<b>3.4600e-003</b>	<b>0.0833</b>	<b>0.0216</b>	<b>3.2900e-003</b>	<b>0.0249</b>	<b>0.0000</b>	<b>137.8647</b>	<b>137.8647</b>	<b>7.8300e-003</b>	<b>0.0000</b>	<b>138.0607</b>

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**3.7 Architectural Coating - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0178	0.1369	0.1441	2.3000e-004		8.9200e-003	8.9200e-003		8.8600e-003	8.8600e-003	0.0000	19.9587	19.9587	3.2300e-003	0.0000	20.0395
<b>Total</b>	<b>1.0241</b>	<b>0.1369</b>	<b>0.1441</b>	<b>2.3000e-004</b>		<b>8.9200e-003</b>	<b>8.9200e-003</b>		<b>8.8600e-003</b>	<b>8.8600e-003</b>	<b>0.0000</b>	<b>19.9587</b>	<b>19.9587</b>	<b>3.2300e-003</b>	<b>0.0000</b>	<b>20.0395</b>

**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	8.3500e-003	6.4900e-003	0.0639	1.2000e-004	0.0114	1.0000e-004	0.0115	3.0500e-003	9.0000e-005	3.1400e-003	0.0000	11.2014	11.2014	5.0000e-004	0.0000	11.2139
<b>Total</b>	<b>8.3500e-003</b>	<b>6.4900e-003</b>	<b>0.0639</b>	<b>1.2000e-004</b>	<b>0.0114</b>	<b>1.0000e-004</b>	<b>0.0115</b>	<b>3.0500e-003</b>	<b>9.0000e-005</b>	<b>3.1400e-003</b>	<b>0.0000</b>	<b>11.2014</b>	<b>11.2014</b>	<b>5.0000e-004</b>	<b>0.0000</b>	<b>11.2139</b>



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**3.7 Architectural Coating - 2018****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	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8700e-003	0.1113	0.1503	2.3000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	19.9587	19.9587	3.2300e-003	0.0000	20.0395
<b>Total</b>	<b>1.0112</b>	<b>0.1113</b>	<b>0.1503</b>	<b>2.3000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>	<b>0.0000</b>	<b>19.9587</b>	<b>19.9587</b>	<b>3.2300e-003</b>	<b>0.0000</b>	<b>20.0395</b>

**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	8.3500e-003	6.4900e-003	0.0639	1.2000e-004	0.0114	1.0000e-004	0.0115	3.0500e-003	9.0000e-005	3.1400e-003	0.0000	11.2014	11.2014	5.0000e-004	0.0000	11.2139
<b>Total</b>	<b>8.3500e-003</b>	<b>6.4900e-003</b>	<b>0.0639</b>	<b>1.2000e-004</b>	<b>0.0114</b>	<b>1.0000e-004</b>	<b>0.0115</b>	<b>3.0500e-003</b>	<b>9.0000e-005</b>	<b>3.1400e-003</b>	<b>0.0000</b>	<b>11.2014</b>	<b>11.2014</b>	<b>5.0000e-004</b>	<b>0.0000</b>	<b>11.2139</b>

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**3.7 Architectural Coating - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7400e-003	0.0453	0.0514	8.0000e-005		2.7300e-003	2.7300e-003		2.7100e-003	2.7100e-003	0.0000	7.1103	7.1103	1.1000e-003	0.0000	7.1379
<b>Total</b>	<b>0.3660</b>	<b>0.0453</b>	<b>0.0514</b>	<b>8.0000e-005</b>		<b>2.7300e-003</b>	<b>2.7300e-003</b>		<b>2.7100e-003</b>	<b>2.7100e-003</b>	<b>0.0000</b>	<b>7.1103</b>	<b>7.1103</b>	<b>1.1000e-003</b>	<b>0.0000</b>	<b>7.1379</b>

**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	2.7100e-003	2.0400e-003	0.0203	4.0000e-005	4.1000e-003	3.0000e-005	4.1300e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.8940	3.8940	1.6000e-004	0.0000	3.8980
<b>Total</b>	<b>2.7100e-003</b>	<b>2.0400e-003</b>	<b>0.0203</b>	<b>4.0000e-005</b>	<b>4.1000e-003</b>	<b>3.0000e-005</b>	<b>4.1300e-003</b>	<b>1.0900e-003</b>	<b>3.0000e-005</b>	<b>1.1200e-003</b>	<b>0.0000</b>	<b>3.8940</b>	<b>3.8940</b>	<b>1.6000e-004</b>	<b>0.0000</b>	<b>3.8980</b>

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**3.7 Architectural Coating - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7400e-003	0.0398	0.0538	8.0000e-005		2.7900e-003	2.7900e-003		2.7900e-003	2.7900e-003	0.0000	7.1103	7.1103	1.1000e-003	0.0000	7.1379
<b>Total</b>	<b>0.3620</b>	<b>0.0398</b>	<b>0.0538</b>	<b>8.0000e-005</b>		<b>2.7900e-003</b>	<b>2.7900e-003</b>		<b>2.7900e-003</b>	<b>2.7900e-003</b>	<b>0.0000</b>	<b>7.1103</b>	<b>7.1103</b>	<b>1.1000e-003</b>	<b>0.0000</b>	<b>7.1379</b>

**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	2.7100e-003	2.0400e-003	0.0203	4.0000e-005	4.1000e-003	3.0000e-005	4.1300e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.8940	3.8940	1.6000e-004	0.0000	3.8980
<b>Total</b>	<b>2.7100e-003</b>	<b>2.0400e-003</b>	<b>0.0203</b>	<b>4.0000e-005</b>	<b>4.1000e-003</b>	<b>3.0000e-005</b>	<b>4.1300e-003</b>	<b>1.0900e-003</b>	<b>3.0000e-005</b>	<b>1.1200e-003</b>	<b>0.0000</b>	<b>3.8940</b>	<b>3.8940</b>	<b>1.6000e-004</b>	<b>0.0000</b>	<b>3.8980</b>

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**3.8 Paving - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.1671	0.1615	2.5000e-004		9.4200e-003	9.4200e-003		8.6900e-003	8.6900e-003	0.0000	21.9547	21.9547	6.7300e-003	0.0000	22.1230
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0167</b>	<b>0.1671</b>	<b>0.1615</b>	<b>2.5000e-004</b>		<b>9.4200e-003</b>	<b>9.4200e-003</b>		<b>8.6900e-003</b>	<b>8.6900e-003</b>	<b>0.0000</b>	<b>21.9547</b>	<b>21.9547</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1230</b>

**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	3.0000e-004	0.0103	2.1100e-003	3.0000e-005	5.3000e-004	5.0000e-005	5.8000e-004	1.5000e-004	5.0000e-005	1.9000e-004	0.0000	2.4902	2.4902	1.6000e-004	0.0000	2.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.6000e-004	8.5600e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.6412	1.6412	7.0000e-005	0.0000	1.6428
<b>Total</b>	<b>1.4400e-003</b>	<b>0.0112</b>	<b>0.0107</b>	<b>5.0000e-005</b>	<b>2.2600e-003</b>	<b>6.0000e-005</b>	<b>2.3200e-003</b>	<b>6.1000e-004</b>	<b>6.0000e-005</b>	<b>6.6000e-004</b>	<b>0.0000</b>	<b>4.1314</b>	<b>4.1314</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>4.1370</b>

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**3.8 Paving - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7300e-003	0.1188	0.1768	2.5000e-004		6.8500e-003	6.8500e-003		6.8500e-003	6.8500e-003	0.0000	21.9546	21.9546	6.7300e-003	0.0000	22.1229
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>5.7300e-003</b>	<b>0.1188</b>	<b>0.1768</b>	<b>2.5000e-004</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>	<b>0.0000</b>	<b>21.9546</b>	<b>21.9546</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1229</b>

**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	3.0000e-004	0.0103	2.1100e-003	3.0000e-005	5.3000e-004	5.0000e-005	5.8000e-004	1.5000e-004	5.0000e-005	1.9000e-004	0.0000	2.4902	2.4902	1.6000e-004	0.0000	2.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.6000e-004	8.5600e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.6412	1.6412	7.0000e-005	0.0000	1.6428
<b>Total</b>	<b>1.4400e-003</b>	<b>0.0112</b>	<b>0.0107</b>	<b>5.0000e-005</b>	<b>2.2600e-003</b>	<b>6.0000e-005</b>	<b>2.3200e-003</b>	<b>6.1000e-004</b>	<b>6.0000e-005</b>	<b>6.6000e-004</b>	<b>0.0000</b>	<b>4.1314</b>	<b>4.1314</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>4.1370</b>

**4.0 Operational Detail - Mobile**

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## 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	0.2649	1.3016	2.9451	8.0200e-003	0.6130	0.0108	0.6238	0.1650	0.0102	0.1752	0.0000	735.6211	735.6211	0.0345	0.0000	736.4846
Unmitigated	0.2649	1.3016	2.9451	8.0200e-003	0.6130	0.0108	0.6238	0.1650	0.0102	0.1752	0.0000	735.6211	735.6211	0.0345	0.0000	736.4846

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	731.58	703.10	644.36	1,651,488	1,651,488
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Total	731.58	703.10	644.36	1,651,488	1,651,488

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
Enclosed Parking with Elevator	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
General Office Building	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

**5.0 Energy Detail**

Historical Energy Use: N

**5.1 Mitigation Measures Energy**

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	231.4055	231.4055	0.0231	4.7900e-003	233.4108
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	233.8912	233.8912	0.0234	4.8400e-003	235.9179
NaturalGas Mitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932
NaturalGas Unmitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932

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**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>

**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>



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**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	734846	96.6630	9.6700e-003	2.0000e-003	97.5006
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>233.8912</b>	<b>0.0234</b>	<b>4.8400e-003</b>	<b>235.9179</b>

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	715950	94.1774	9.4200e-003	1.9500e-003	94.9935
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>231.4055</b>	<b>0.0231</b>	<b>4.7900e-003</b>	<b>233.4108</b>

**6.0 Area Detail**

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**6.1 Mitigation Measures Area**

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2798	9.2798	2.2600e-003	1.3000e-004	9.3750
Unmitigated	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2798	9.2798	2.2600e-003	1.3000e-004	9.3750

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1158	7.1158	1.4000e-004	1.3000e-004	7.1581
Landscaping	0.0406	0.0154	1.3287	7.0000e-005		7.3000e-003	7.3000e-003		7.3000e-003	7.3000e-003	0.0000	2.1639	2.1639	2.1200e-003	0.0000	2.2169
<b>Total</b>	<b>0.9561</b>	<b>0.0215</b>	<b>1.3313</b>	<b>1.1000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>	<b>0.0000</b>	<b>9.2798</b>	<b>9.2798</b>	<b>2.2600e-003</b>	<b>1.3000e-004</b>	<b>9.3750</b>

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**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1158	7.1158	1.4000e-004	1.3000e-004	7.1581
Landscaping	0.0406	0.0154	1.3287	7.0000e-005		7.3000e-003	7.3000e-003		7.3000e-003	7.3000e-003	0.0000	2.1639	2.1639	2.1200e-003	0.0000	2.2169
<b>Total</b>	<b>0.9561</b>	<b>0.0215</b>	<b>1.3313</b>	<b>1.1000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>	<b>0.0000</b>	<b>9.2798</b>	<b>9.2798</b>	<b>2.2600e-003</b>	<b>1.3000e-004</b>	<b>9.3750</b>

**7.0 Water Detail****7.1 Mitigation Measures Water**

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	17.9844	0.0170	0.0101	21.4288
Unmitigated	21.6791	0.0211	0.0127	25.9775

## 7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	11.5974 / 7.31141	15.7241	0.0153	9.1600e-003	18.8369
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	4.41846 / 2.70809	5.9550	5.8200e-003	3.4900e-003	7.1406
<b>Total</b>		<b>21.6791</b>	<b>0.0211</b>	<b>0.0127</b>	<b>25.9775</b>

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**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	9.27793 / 6.86542	13.0471	0.0123	7.3400e-003	15.5415
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	3.53477 / 2.5429	4.9373	4.6700e-003	2.8000e-003	5.8873
<b>Total</b>		<b>17.9844</b>	<b>0.0169</b>	<b>0.0101</b>	<b>21.4288</b>

**8.0 Waste Detail**

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**8.1 Mitigation Measures Waste**

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	21.3141	1.2596	0.0000	52.8047
Unmitigated	21.3141	1.2596	0.0000	52.8047

**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

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**8.2 Waste by Land Use****Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

**9.0 Operational Offroad**

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

Equipment Type	Number
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## **11.0 Vegetation**

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Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

## Haystack, Petaluma, TAC

### Sonoma-San Francisco County, Annual

## 1.0 Project Characteristics

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### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	24.86	1000sqft	0.00	24,855.00	0
Enclosed Parking with Elevator	256.00	Space	0.00	102,400.00	0
Apartments Mid Rise	178.00	Dwelling Unit	4.10	172,686.00	509

### 1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	75
Climate Zone	4			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

### 1.3 User Entered Comments & Non-Default Data

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Project Characteristics - PG&E 2020 rate

Land Use - Land Uses: 178 dwelling units, 256 parking spaces, and 24,855-sf of commercial

Construction Phase - Applicant provided construction schedule. Using the Total Work Days provided for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Trips and VMT - 800 cement truck trips (400 round trips)

Paving trips=  $500/16 \times 2 \sim 64$  trips

TAC Trip Length 1 mile

Demolition - 100 tons of pavement demolished

Grading - 2500 cubic yards soil export

Architectural Coating -

Vehicle Trips - Using project trip generation rate

Woodstoves - NG fireplaces = 57

Energy Use -

Water And Wastewater - All WTP treatment

Solid Waste -

Construction Off-road Equipment Mitigation - BMPS, Tier 3

Area Mitigation -

Energy Mitigation -

Water Mitigation -

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Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	18.00	110.00

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tblConstructionPhase	NumDays	230.00	88.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	22.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	PhaseEndDate	2/22/2019	2/8/2019
tblConstructionPhase	PhaseEndDate	1/3/2019	9/10/2018
tblConstructionPhase	PhaseEndDate	1/29/2018	1/8/2018
tblConstructionPhase	PhaseEndDate	2/15/2018	2/6/2018
tblConstructionPhase	PhaseEndDate	1/29/2019	3/12/2019
tblConstructionPhase	PhaseEndDate	2/5/2018	2/6/2018
tblConstructionPhase	PhaseStartDate	1/30/2019	9/10/2018
tblConstructionPhase	PhaseStartDate	2/16/2018	5/10/2018
tblConstructionPhase	PhaseStartDate	2/6/2018	1/10/2018
tblConstructionPhase	PhaseStartDate	1/4/2019	2/10/2019
tblConstructionPhase	PhaseStartDate	1/30/2018	1/10/2018
tblGrading	MaterialExported	0.00	2,500.00
tblLandUse	LandUseSquareFeet	24,860.00	24,855.00
tblLandUse	LandUseSquareFeet	178,000.00	172,686.00
tblLandUse	LotAcreage	0.57	0.00
tblLandUse	LotAcreage	2.30	0.00
tblLandUse	LotAcreage	4.68	4.10
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.31	0.31

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tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	1.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripNumber	313.00	312.00

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tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00

## 2.0 Emissions Summary

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## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.1815	1.7283	1.1377	1.8600e-003	0.2621	0.0872	0.3492	0.1363	0.0809	0.2172	0.0000	170.2842	170.2842	0.0452	0.0000	171.4153
2019	0.3841	0.2164	0.2215	3.4000e-004	5.7000e-004	0.0122	0.0127	1.5000e-004	0.0114	0.0116	0.0000	30.0820	30.0820	7.9500e-003	0.0000	30.2806
Maximum	1.1815	1.7283	1.1377	1.8600e-003	0.2621	0.0872	0.3492	0.1363	0.0809	0.2172	0.0000	170.2842	170.2842	0.0452	0.0000	171.4153

**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.0692	0.9963	1.2124	1.8600e-003	0.1231	0.0451	0.1682	0.0326	0.0451	0.0777	0.0000	170.2840	170.2840	0.0452	0.0000	171.4151
2019	0.3692	0.1626	0.2393	3.4000e-004	5.7000e-004	9.6600e-003	0.0102	1.5000e-004	9.6600e-003	9.8100e-003	0.0000	30.0819	30.0819	7.9500e-003	0.0000	30.2806
Maximum	1.0692	0.9963	1.2124	1.8600e-003	0.1231	0.0451	0.1682	0.0326	0.0451	0.0777	0.0000	170.2840	170.2840	0.0452	0.0000	171.4151

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	8.13	40.41	-6.80	0.00	52.92	44.85	50.71	75.97	40.68	61.73	0.00	0.00	0.00	0.00	0.00	0.00



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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2018	4-1-2018	1.1732	0.5329
2	4-2-2018	7-1-2018	0.3036	0.2154
3	7-2-2018	10-1-2018	0.5031	0.4163
4	10-2-2018	1-1-2019	0.9454	0.9142
5	1-2-2019	4-1-2019	0.5753	0.5068
		Highest	1.1732	0.9142

## 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	1.3661	0.0248	1.8942	1.2000e-003		0.0882	0.0882		0.0882	0.0882	8.1150	5.4972	13.6121	0.0152	5.3000e-004	14.1497
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	337.6677	337.6677	0.0254	6.7400e-003	340.3112
Mobile	0.5067	2.4933	5.6445	0.0154	1.1766	0.0208	1.1973	0.3167	0.0196	0.3363	0.0000	1,411.5794	1,411.5794	0.0662	0.0000	1,413.2343
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	5.0811	16.0126	21.0937	0.5235	0.0127	37.9516
<b>Total</b>	<b>1.8833</b>	<b>2.6089</b>	<b>7.5856</b>	<b>0.0172</b>	<b>1.1766</b>	<b>0.1162</b>	<b>1.2927</b>	<b>0.3167</b>	<b>0.1150</b>	<b>0.4317</b>	<b>34.5101</b>	<b>1,770.7568</b>	<b>1,805.2669</b>	<b>1.8898</b>	<b>0.0199</b>	<b>1,858.4514</b>

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**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	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2748	9.2748	2.2500e-003	1.3000e-004	9.3700
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	335.1820	335.1820	0.0251	6.6900e-003	337.8040
Mobile	0.5067	2.4933	5.6445	0.0154	1.1766	0.0208	1.1973	0.3167	0.0196	0.3363	0.0000	1,411.5794	1,411.5794	0.0662	0.0000	1,413.2343
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	4.0649	13.4513	17.5162	0.4189	0.0101	31.0080
<b>Total</b>	<b>1.4733</b>	<b>2.6056</b>	<b>7.0227</b>	<b>0.0161</b>	<b>1.1766</b>	<b>0.0358</b>	<b>1.2124</b>	<b>0.3167</b>	<b>0.0346</b>	<b>0.3513</b>	<b>25.3789</b>	<b>1,769.4875</b>	<b>1,794.8664</b>	<b>1.7721</b>	<b>0.0170</b>	<b>1,844.2210</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>21.77</b>	<b>0.13</b>	<b>7.42</b>	<b>6.35</b>	<b>0.00</b>	<b>69.19</b>	<b>6.22</b>	<b>0.00</b>	<b>69.89</b>	<b>18.62</b>	<b>26.46</b>	<b>0.07</b>	<b>0.58</b>	<b>6.23</b>	<b>14.86</b>	<b>0.77</b>

**3.0 Construction Detail****Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2018	1/8/2018	5	5	
2	Site Preparation	Site Preparation	1/10/2018	2/6/2018	5	20	
3	Grading	Grading	1/10/2018	2/6/2018	5	20	
4	Trenching	Trenching	2/10/2018	5/14/2018	5	66	
5	Building Construction	Building Construction	5/10/2018	9/10/2018	5	88	
6	Architectural Coating	Architectural Coating	9/10/2018	2/8/2019	5	110	
7	Paving	Paving	2/10/2019	3/12/2019	5	22	

**Acres of Grading (Site Preparation Phase): 10**

**Acres of Grading (Grading Phase): 10**

**Acres of Paving: 0**

**Residential Indoor: 349,689; Residential Outdoor: 116,563; Non-Residential Indoor: 37,283; Non-Residential Outdoor: 12,428; Striped Parking Area: 6,144 (Architectural Coating – sqft)**

**OffRoad Equipment**

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	1.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	0	0.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	63	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	2	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	10.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	8	20.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	312.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	179.00	40.00	800.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	36.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	64.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

**3.1 Mitigation Measures Construction**

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.2 Demolition - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0700e-003	0.0000	1.0700e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0926	0.0523	9.0000e-005		4.6400e-003	4.6400e-003		4.2700e-003	4.2700e-003	0.0000	8.1434	8.1434	2.5400e-003	0.0000	8.2067
<b>Total</b>	<b>8.6600e-003</b>	<b>0.0926</b>	<b>0.0523</b>	<b>9.0000e-005</b>	<b>1.0700e-003</b>	<b>4.6400e-003</b>	<b>5.7100e-003</b>	<b>1.6000e-004</b>	<b>4.2700e-003</b>	<b>4.4300e-003</b>	<b>0.0000</b>	<b>8.1434</b>	<b>8.1434</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2067</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	5.5000e-004	1.0000e-004	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0563	0.0563	1.0000e-005	0.0000	0.0565
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	4.0000e-005	4.6000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0342	0.0342	0.0000	0.0000	0.0342
<b>Total</b>	<b>8.0000e-005</b>	<b>5.9000e-004</b>	<b>5.6000e-004</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0904</b>	<b>0.0904</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0908</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.2 Demolition - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.8000e-004	0.0000	4.8000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0430	0.0579	9.0000e-005		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	8.1434	8.1434	2.5400e-003	0.0000	8.2067
<b>Total</b>	<b>2.1900e-003</b>	<b>0.0430</b>	<b>0.0579</b>	<b>9.0000e-005</b>	<b>4.8000e-004</b>	<b>1.9600e-003</b>	<b>2.4400e-003</b>	<b>4.0000e-005</b>	<b>1.9600e-003</b>	<b>2.0000e-003</b>	<b>0.0000</b>	<b>8.1434</b>	<b>8.1434</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2067</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	5.5000e-004	1.0000e-004	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0563	0.0563	1.0000e-005	0.0000	0.0565
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	4.0000e-005	4.6000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0342	0.0342	0.0000	0.0000	0.0342
<b>Total</b>	<b>8.0000e-005</b>	<b>5.9000e-004</b>	<b>5.6000e-004</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0904</b>	<b>0.0904</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0908</b>

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**3.3 Site Preparation - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1860	0.0000	0.1860	0.0999	0.0000	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5530	0.2439	4.5000e-004		0.0281	0.0281		0.0258	0.0258	0.0000	40.8182	40.8182	0.0127	0.0000	41.1359
<b>Total</b>	<b>0.0508</b>	<b>0.5530</b>	<b>0.2439</b>	<b>4.5000e-004</b>	<b>0.1860</b>	<b>0.0281</b>	<b>0.2141</b>	<b>0.0999</b>	<b>0.0258</b>	<b>0.1257</b>	<b>0.0000</b>	<b>40.8182</b>	<b>40.8182</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1359</b>

**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	3.9000e-004	1.9000e-004	2.4300e-003	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1822	0.1822	1.0000e-005	0.0000	0.1826
<b>Total</b>	<b>3.9000e-004</b>	<b>1.9000e-004</b>	<b>2.4300e-003</b>	<b>0.0000</b>	<b>1.5000e-004</b>	<b>0.0000</b>	<b>1.5000e-004</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.1822</b>	<b>0.1822</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.1826</b>



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**3.3 Site Preparation - 2018****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					0.0837	0.0000	0.0837	0.0225	0.0000	0.0225	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0109	0.2219	0.2647	4.5000e-004		0.0107	0.0107		0.0107	0.0107	0.0000	40.8181	40.8181	0.0127	0.0000	41.1358
<b>Total</b>	<b>0.0109</b>	<b>0.2219</b>	<b>0.2647</b>	<b>4.5000e-004</b>	<b>0.0837</b>	<b>0.0107</b>	<b>0.0943</b>	<b>0.0225</b>	<b>0.0107</b>	<b>0.0331</b>	<b>0.0000</b>	<b>40.8181</b>	<b>40.8181</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1358</b>

**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	3.9000e-004	1.9000e-004	2.4300e-003	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1822	0.1822	1.0000e-005	0.0000	0.1826
<b>Total</b>	<b>3.9000e-004</b>	<b>1.9000e-004</b>	<b>2.4300e-003</b>	<b>0.0000</b>	<b>1.5000e-004</b>	<b>0.0000</b>	<b>1.5000e-004</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.1822</b>	<b>0.1822</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.1826</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.4 Grading - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0657	0.0000	0.0657	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.3067	0.1658	3.0000e-004		0.0155	0.0155		0.0143	0.0143	0.0000	27.1069	27.1069	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>0.0277</b>	<b>0.3067</b>	<b>0.1658</b>	<b>3.0000e-004</b>	<b>0.0657</b>	<b>0.0155</b>	<b>0.0812</b>	<b>0.0337</b>	<b>0.0143</b>	<b>0.0480</b>	<b>0.0000</b>	<b>27.1069</b>	<b>27.1069</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1000e-004	0.0170	3.1900e-003	2.0000e-005	1.3000e-004	4.0000e-005	1.7000e-004	4.0000e-005	4.0000e-005	7.0000e-005	0.0000	1.7556	1.7556	3.2000e-004	0.0000	1.7636
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
<b>Total</b>	<b>7.0000e-004</b>	<b>0.0172</b>	<b>5.0100e-003</b>	<b>2.0000e-005</b>	<b>2.4000e-004</b>	<b>4.0000e-005</b>	<b>2.8000e-004</b>	<b>7.0000e-005</b>	<b>4.0000e-005</b>	<b>1.0000e-004</b>	<b>0.0000</b>	<b>1.8923</b>	<b>1.8923</b>	<b>3.3000e-004</b>	<b>0.0000</b>	<b>1.9005</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.4 Grading - 2018****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					0.0296	0.0000	0.0296	7.5800e-003	0.0000	7.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2600e-003	0.1484	0.1899	3.0000e-004		7.5600e-003	7.5600e-003		7.5600e-003	7.5600e-003	0.0000	27.1068	27.1068	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>7.2600e-003</b>	<b>0.1484</b>	<b>0.1899</b>	<b>3.0000e-004</b>	<b>0.0296</b>	<b>7.5600e-003</b>	<b>0.0371</b>	<b>7.5800e-003</b>	<b>7.5600e-003</b>	<b>0.0151</b>	<b>0.0000</b>	<b>27.1068</b>	<b>27.1068</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1000e-004	0.0170	3.1900e-003	2.0000e-005	1.3000e-004	4.0000e-005	1.7000e-004	4.0000e-005	4.0000e-005	7.0000e-005	0.0000	1.7556	1.7556	3.2000e-004	0.0000	1.7636
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
<b>Total</b>	<b>7.0000e-004</b>	<b>0.0172</b>	<b>5.0100e-003</b>	<b>2.0000e-005</b>	<b>2.4000e-004</b>	<b>4.0000e-005</b>	<b>2.8000e-004</b>	<b>7.0000e-005</b>	<b>4.0000e-005</b>	<b>1.0000e-004</b>	<b>0.0000</b>	<b>1.8923</b>	<b>1.8923</b>	<b>3.3000e-004</b>	<b>0.0000</b>	<b>1.9005</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.5 Trenching - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.1891	0.1854	2.7000e-004		0.0111	0.0111		0.0102	0.0102	0.0000	24.9583	24.9583	7.7700e-003	0.0000	25.1525
<b>Total</b>	<b>0.0183</b>	<b>0.1891</b>	<b>0.1854</b>	<b>2.7000e-004</b>		<b>0.0111</b>	<b>0.0111</b>		<b>0.0102</b>	<b>0.0102</b>	<b>0.0000</b>	<b>24.9583</b>	<b>24.9583</b>	<b>7.7700e-003</b>	<b>0.0000</b>	<b>25.1525</b>

**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	3.2000e-004	1.6000e-004	2.0000e-003	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1503	0.1503	1.0000e-005	0.0000	0.1506
<b>Total</b>	<b>3.2000e-004</b>	<b>1.6000e-004</b>	<b>2.0000e-003</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.1503</b>	<b>0.1503</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.1506</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.5 Trenching - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7100e-003	0.1385	0.2069	2.7000e-004		7.9300e-003	7.9300e-003		7.9300e-003	7.9300e-003	0.0000	24.9583	24.9583	7.7700e-003	0.0000	25.1525
<b>Total</b>	<b>6.7100e-003</b>	<b>0.1385</b>	<b>0.2069</b>	<b>2.7000e-004</b>		<b>7.9300e-003</b>	<b>7.9300e-003</b>		<b>7.9300e-003</b>	<b>7.9300e-003</b>	<b>0.0000</b>	<b>24.9583</b>	<b>24.9583</b>	<b>7.7700e-003</b>	<b>0.0000</b>	<b>25.1525</b>

**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	3.2000e-004	1.6000e-004	2.0000e-003	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1503	0.1503	1.0000e-005	0.0000	0.1506
<b>Total</b>	<b>3.2000e-004</b>	<b>1.6000e-004</b>	<b>2.0000e-003</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.1503</b>	<b>0.1503</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.1506</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.6 Building Construction - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.2454	0.1738	2.3000e-004		0.0182	0.0182		0.0168	0.0168	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>0.0267</b>	<b>0.2454</b>	<b>0.1738</b>	<b>2.3000e-004</b>		<b>0.0182</b>	<b>0.0182</b>		<b>0.0168</b>	<b>0.0168</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0600e-003	0.0436	8.1900e-003	5.0000e-005	3.4000e-004	1.0000e-004	4.4000e-004	9.0000e-005	9.0000e-005	1.9000e-004	0.0000	4.5016	4.5016	8.1000e-004	0.0000	4.5220
Vendor	4.4300e-003	0.1339	0.0410	1.3000e-004	1.6000e-003	4.5000e-004	2.0500e-003	4.7000e-004	4.3000e-004	9.0000e-004	0.0000	12.6660	12.6660	2.0700e-003	0.0000	12.7179
Worker	0.0153	7.5700e-003	0.0957	8.0000e-005	5.7900e-003	1.1000e-004	5.9000e-003	1.5500e-003	1.0000e-004	1.6500e-003	0.0000	7.1750	7.1750	5.7000e-004	0.0000	7.1892
<b>Total</b>	<b>0.0208</b>	<b>0.1851</b>	<b>0.1449</b>	<b>2.6000e-004</b>	<b>7.7300e-003</b>	<b>6.6000e-004</b>	<b>8.3900e-003</b>	<b>2.1100e-003</b>	<b>6.2000e-004</b>	<b>2.7400e-003</b>	<b>0.0000</b>	<b>24.3426</b>	<b>24.3426</b>	<b>3.4500e-003</b>	<b>0.0000</b>	<b>24.4290</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.6 Building Construction - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7500e-003	0.1286	0.1702	2.3000e-004		8.5300e-003	8.5300e-003		8.5300e-003	8.5300e-003	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>5.7500e-003</b>	<b>0.1286</b>	<b>0.1702</b>	<b>2.3000e-004</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0600e-003	0.0436	8.1900e-003	5.0000e-005	3.4000e-004	1.0000e-004	4.4000e-004	9.0000e-005	9.0000e-005	1.9000e-004	0.0000	4.5016	4.5016	8.1000e-004	0.0000	4.5220
Vendor	4.4300e-003	0.1339	0.0410	1.3000e-004	1.6000e-003	4.5000e-004	2.0500e-003	4.7000e-004	4.3000e-004	9.0000e-004	0.0000	12.6660	12.6660	2.0700e-003	0.0000	12.7179
Worker	0.0153	7.5700e-003	0.0957	8.0000e-005	5.7900e-003	1.1000e-004	5.9000e-003	1.5500e-003	1.0000e-004	1.6500e-003	0.0000	7.1750	7.1750	5.7000e-004	0.0000	7.1892
<b>Total</b>	<b>0.0208</b>	<b>0.1851</b>	<b>0.1449</b>	<b>2.6000e-004</b>	<b>7.7300e-003</b>	<b>6.6000e-004</b>	<b>8.3900e-003</b>	<b>2.1100e-003</b>	<b>6.2000e-004</b>	<b>2.7400e-003</b>	<b>0.0000</b>	<b>24.3426</b>	<b>24.3426</b>	<b>3.4500e-003</b>	<b>0.0000</b>	<b>24.4290</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.7 Architectural Coating - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0178	0.1369	0.1441	2.3000e-004		8.9200e-003	8.9200e-003		8.8600e-003	8.8600e-003	0.0000	19.9587	19.9587	3.2300e-003	0.0000	20.0395
<b>Total</b>	<b>1.0241</b>	<b>0.1369</b>	<b>0.1441</b>	<b>2.3000e-004</b>		<b>8.9200e-003</b>	<b>8.9200e-003</b>		<b>8.8600e-003</b>	<b>8.8600e-003</b>	<b>0.0000</b>	<b>19.9587</b>	<b>19.9587</b>	<b>3.2300e-003</b>	<b>0.0000</b>	<b>20.0395</b>

**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	2.8400e-003	1.4000e-003	0.0177	1.0000e-005	1.0700e-003	2.0000e-005	1.0900e-003	2.9000e-004	2.0000e-005	3.1000e-004	0.0000	1.3282	1.3282	1.1000e-004	0.0000	1.3309
<b>Total</b>	<b>2.8400e-003</b>	<b>1.4000e-003</b>	<b>0.0177</b>	<b>1.0000e-005</b>	<b>1.0700e-003</b>	<b>2.0000e-005</b>	<b>1.0900e-003</b>	<b>2.9000e-004</b>	<b>2.0000e-005</b>	<b>3.1000e-004</b>	<b>0.0000</b>	<b>1.3282</b>	<b>1.3282</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>1.3309</b>



## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**3.7 Architectural Coating - 2018****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	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8700e-003	0.1113	0.1503	2.3000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	19.9587	19.9587	3.2300e-003	0.0000	20.0395
<b>Total</b>	<b>1.0112</b>	<b>0.1113</b>	<b>0.1503</b>	<b>2.3000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>	<b>0.0000</b>	<b>19.9587</b>	<b>19.9587</b>	<b>3.2300e-003</b>	<b>0.0000</b>	<b>20.0395</b>

**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	2.8400e-003	1.4000e-003	0.0177	1.0000e-005	1.0700e-003	2.0000e-005	1.0900e-003	2.9000e-004	2.0000e-005	3.1000e-004	0.0000	1.3282	1.3282	1.1000e-004	0.0000	1.3309
<b>Total</b>	<b>2.8400e-003</b>	<b>1.4000e-003</b>	<b>0.0177</b>	<b>1.0000e-005</b>	<b>1.0700e-003</b>	<b>2.0000e-005</b>	<b>1.0900e-003</b>	<b>2.9000e-004</b>	<b>2.0000e-005</b>	<b>3.1000e-004</b>	<b>0.0000</b>	<b>1.3282</b>	<b>1.3282</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>1.3309</b>

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**3.7 Architectural Coating - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7400e-003	0.0453	0.0514	8.0000e-005		2.7300e-003	2.7300e-003		2.7100e-003	2.7100e-003	0.0000	7.1103	7.1103	1.1000e-003	0.0000	7.1379
<b>Total</b>	<b>0.3660</b>	<b>0.0453</b>	<b>0.0514</b>	<b>8.0000e-005</b>		<b>2.7300e-003</b>	<b>2.7300e-003</b>		<b>2.7100e-003</b>	<b>2.7100e-003</b>	<b>0.0000</b>	<b>7.1103</b>	<b>7.1103</b>	<b>1.1000e-003</b>	<b>0.0000</b>	<b>7.1379</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	4.4000e-004	5.6700e-003	1.0000e-005	3.8000e-004	1.0000e-005	3.9000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.4622	0.4622	3.0000e-005	0.0000	0.4630
<b>Total</b>	<b>9.2000e-004</b>	<b>4.4000e-004</b>	<b>5.6700e-003</b>	<b>1.0000e-005</b>	<b>3.8000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.4622</b>	<b>0.4622</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.4630</b>

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**3.7 Architectural Coating - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7400e-003	0.0398	0.0538	8.0000e-005		2.7900e-003	2.7900e-003		2.7900e-003	2.7900e-003	0.0000	7.1103	7.1103	1.1000e-003	0.0000	7.1379
<b>Total</b>	<b>0.3620</b>	<b>0.0398</b>	<b>0.0538</b>	<b>8.0000e-005</b>		<b>2.7900e-003</b>	<b>2.7900e-003</b>		<b>2.7900e-003</b>	<b>2.7900e-003</b>	<b>0.0000</b>	<b>7.1103</b>	<b>7.1103</b>	<b>1.1000e-003</b>	<b>0.0000</b>	<b>7.1379</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	4.4000e-004	5.6700e-003	1.0000e-005	3.8000e-004	1.0000e-005	3.9000e-004	1.0000e-004	1.0000e-005	1.1000e-004	0.0000	0.4622	0.4622	3.0000e-005	0.0000	0.4630
<b>Total</b>	<b>9.2000e-004</b>	<b>4.4000e-004</b>	<b>5.6700e-003</b>	<b>1.0000e-005</b>	<b>3.8000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.4622</b>	<b>0.4622</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.4630</b>

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**3.8 Paving - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.1671	0.1615	2.5000e-004		9.4200e-003	9.4200e-003		8.6900e-003	8.6900e-003	0.0000	21.9547	21.9547	6.7300e-003	0.0000	22.1230
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0167</b>	<b>0.1671</b>	<b>0.1615</b>	<b>2.5000e-004</b>		<b>9.4200e-003</b>	<b>9.4200e-003</b>		<b>8.6900e-003</b>	<b>8.6900e-003</b>	<b>0.0000</b>	<b>21.9547</b>	<b>21.9547</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1230</b>

**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	8.0000e-005	3.3900e-003	6.0000e-004	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.3601	0.3601	6.0000e-005	0.0000	0.3617
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	3.9000e-004	1.9000e-004	2.3900e-003	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1948	0.1948	1.0000e-005	0.0000	0.1951
<b>Total</b>	<b>4.7000e-004</b>	<b>3.5800e-003</b>	<b>2.9900e-003</b>	<b>0.0000</b>	<b>1.9000e-004</b>	<b>1.0000e-005</b>	<b>1.9000e-004</b>	<b>5.0000e-005</b>	<b>1.0000e-005</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>0.5549</b>	<b>0.5549</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>0.5568</b>

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**3.8 Paving - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7300e-003	0.1188	0.1768	2.5000e-004		6.8500e-003	6.8500e-003		6.8500e-003	6.8500e-003	0.0000	21.9546	21.9546	6.7300e-003	0.0000	22.1229
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>5.7300e-003</b>	<b>0.1188</b>	<b>0.1768</b>	<b>2.5000e-004</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>	<b>0.0000</b>	<b>21.9546</b>	<b>21.9546</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1229</b>

**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	8.0000e-005	3.3900e-003	6.0000e-004	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.3601	0.3601	6.0000e-005	0.0000	0.3617
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	3.9000e-004	1.9000e-004	2.3900e-003	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1948	0.1948	1.0000e-005	0.0000	0.1951
<b>Total</b>	<b>4.7000e-004</b>	<b>3.5800e-003</b>	<b>2.9900e-003</b>	<b>0.0000</b>	<b>1.9000e-004</b>	<b>1.0000e-005</b>	<b>1.9000e-004</b>	<b>5.0000e-005</b>	<b>1.0000e-005</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>0.5549</b>	<b>0.5549</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>0.5568</b>

**4.0 Operational Detail - Mobile**

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## 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	0.5067	2.4933	5.6445	0.0154	1.1766	0.0208	1.1973	0.3167	0.0196	0.3363	0.0000	1,411.5794	1,411.5794	0.0662	0.0000	1,413.2343
Unmitigated	0.5067	2.4933	5.6445	0.0154	1.1766	0.0208	1.1973	0.3167	0.0196	0.3363	0.0000	1,411.5794	1,411.5794	0.0662	0.0000	1,413.2343

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,183.70	1,137.42	1043.08	2,672,216	2,672,216
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	274.21	61.16	26.10	497,850	497,850
Total	1,457.91	1,198.58	1,069.18	3,170,065	3,170,065

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

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**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
Enclosed Parking with Elevator	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
General Office Building	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

**5.0 Energy Detail**

Historical Energy Use: N

**5.1 Mitigation Measures Energy**

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	231.4055	231.4055	0.0231	4.7900e-003	233.4108
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	233.8912	233.8912	0.0234	4.8400e-003	235.9179
NaturalGas Mitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932
NaturalGas Unmitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932

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**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>

**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>



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**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	734846	96.6630	9.6700e-003	2.0000e-003	97.5006
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>233.8912</b>	<b>0.0234</b>	<b>4.8400e-003</b>	<b>235.9179</b>

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	715950	94.1774	9.4200e-003	1.9500e-003	94.9935
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>231.4055</b>	<b>0.0231</b>	<b>4.7900e-003</b>	<b>233.4108</b>

**6.0 Area Detail**

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**6.1 Mitigation Measures Area**

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9561	0.0215	1.3313	1.1000e-004		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	9.2748	9.2748	2.2500e-003	1.3000e-004	9.3700
Unmitigated	1.3661	0.0248	1.8942	1.2000e-003		0.0882	0.0882		0.0882	0.0882	8.1150	5.4972	13.6121	0.0152	5.3000e-004	14.1497

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**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.4107	9.4500e-003	0.5655	1.1300e-003		0.0809	0.0809		0.0809	0.0809	8.1150	3.3332	11.4482	0.0130	5.3000e-004	11.9328
Landscaping	0.0406	0.0154	1.3287	7.0000e-005		7.3000e-003	7.3000e-003		7.3000e-003	7.3000e-003	0.0000	2.1639	2.1639	2.1200e-003	0.0000	2.2169
<b>Total</b>	<b>1.3661</b>	<b>0.0248</b>	<b>1.8942</b>	<b>1.2000e-003</b>		<b>0.0882</b>	<b>0.0882</b>		<b>0.0882</b>	<b>0.0882</b>	<b>8.1150</b>	<b>5.4972</b>	<b>13.6121</b>	<b>0.0152</b>	<b>5.3000e-004</b>	<b>14.1497</b>

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**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1109	7.1109	1.4000e-004	1.3000e-004	7.1531
Landscaping	0.0406	0.0154	1.3287	7.0000e-005		7.3000e-003	7.3000e-003		7.3000e-003	7.3000e-003	0.0000	2.1639	2.1639	2.1200e-003	0.0000	2.2169
<b>Total</b>	<b>0.9561</b>	<b>0.0215</b>	<b>1.3313</b>	<b>1.1000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>	<b>0.0000</b>	<b>9.2748</b>	<b>9.2748</b>	<b>2.2600e-003</b>	<b>1.3000e-004</b>	<b>9.3700</b>

**7.0 Water Detail****7.1 Mitigation Measures Water**

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	17.5162	0.4189	0.0101	31.0080
Unmitigated	21.0937	0.5235	0.0127	37.9516

**7.2 Water by Land Use****Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	11.5974 / 7.31141	15.3002	0.3791	9.1600e-003	27.5075
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	4.41846 / 2.70809	5.7935	0.1444	3.4900e-003	10.4440
<b>Total</b>		<b>21.0937</b>	<b>0.5235</b>	<b>0.0127</b>	<b>37.9516</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	9.27793 / 6.86542	12.7081	0.3033	7.3400e-003	22.4780
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	3.53477 / 2.5429	4.8081	0.1156	2.8000e-003	8.5300
<b>Total</b>		<b>17.5162</b>	<b>0.4189</b>	<b>0.0101</b>	<b>31.0080</b>

**8.0 Waste Detail****8.1 Mitigation Measures Waste**

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	21.3141	1.2596	0.0000	52.8047
Unmitigated	21.3141	1.2596	0.0000	52.8047

**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

## Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

**8.2 Waste by Land Use****Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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**10.0 Stationary Equipment****Fire Pumps and Emergency Generators**

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

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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Haystack, Petaluma, TAC - Sonoma-San Francisco County, Annual

## **11.0 Vegetation**

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## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

## Haystack, Petaluma, AQ

### Sonoma-San Francisco County, Annual

## 1.0 Project Characteristics

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### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	24.86	1000sqft	0.00	24,855.00	0
Enclosed Parking with Elevator	256.00	Space	0.00	102,400.00	0
Apartments Mid Rise	178.00	Dwelling Unit	4.10	172,686.00	509

### 1.2 Other Project Characteristics

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

### 1.3 User Entered Comments & Non-Default Data

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Project Characteristics - PG&E 2020 rate

Land Use - Land Uses: 178 dwelling units, 256 parking spaces, and 24,855-sf of commercial

Construction Phase - Applicant provided construction schedule. Using the Total Work Days provided for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Off-road Equipment - Applicant info from Construction Sheet, using hours per day and highlighted equipment for each phase

Trips and VMT - 800 cement truck trips (400 round trips)

Paving trips=  $500/16 \times 2 \sim 64$  trips

TAC Trip Length 1 mile

Demolition - 100 tons of pavement demolished

Grading - 2500 cubic yards soil export

Architectural Coating -

Vehicle Trips - Using project trip generation rate, (732 trips/178 units) = weekday 4.11, Saturday 3.95, Sunday 3.62

Woodstoves - NG fireplaces = 57

Energy Use -

Water And Wastewater - All WTP treatment

Solid Waste -

Construction Off-road Equipment Mitigation - BMPS, Tier 3

Area Mitigation -

Energy Mitigation -

Water Mitigation -

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	18.00	110.00

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

tblConstructionPhase	NumDays	230.00	88.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	22.00
tblConstructionPhase	NumDays	5.00	20.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	26.70	57.00
tblFireplaces	NumberWood	30.26	0.00
tblGrading	MaterialExported	0.00	2,500.00
tblLandUse	LandUseSquareFeet	24,860.00	24,855.00
tblLandUse	LandUseSquareFeet	178,000.00	172,686.00
tblLandUse	LotAcreage	0.57	0.00
tblLandUse	LotAcreage	2.30	0.00
tblLandUse	LotAcreage	4.68	4.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	1.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	313.00	312.00
tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblVehicleTrips	ST_TR	6.39	3.95
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	5.86	3.62
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	6.65	4.11
tblVehicleTrips	WD_TR	11.03	0.00
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
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

## 2.0 Emissions Summary

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## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.2286	2.0072	1.5065	3.3400e-003	0.3510	0.0904	0.4414	0.1602	0.0839	0.2442	0.0000	308.3051	308.3051	0.0507	0.0000	309.5715
2019	0.3869	0.2257	0.2439	4.2000e-004	6.3500e-003	0.0123	0.0186	1.7000e-003	0.0115	0.0132	0.0000	37.1030	37.1030	8.2200e-003	0.0000	37.3086
Maximum	1.2286	2.0072	1.5065	3.3400e-003	0.3510	0.0904	0.4414	0.1602	0.0839	0.2442	0.0000	308.3051	308.3051	0.0507	0.0000	309.5715

**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	1.1163	1.2751	1.5812	3.3400e-003	0.2120	0.0483	0.2604	0.0566	0.0482	0.1047	0.0000	308.3049	308.3049	0.0507	0.0000	309.5713
2019	0.3719	0.1719	0.2617	4.2000e-004	6.3500e-003	9.7500e-003	0.0161	1.7000e-003	9.7500e-003	0.0114	0.0000	37.1030	37.1030	8.2200e-003	0.0000	37.3085
Maximum	1.1163	1.2751	1.5812	3.3400e-003	0.2120	0.0483	0.2604	0.0566	0.0482	0.1047	0.0000	308.3049	308.3049	0.0507	0.0000	309.5713

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	7.88	35.20	-5.28	0.00	38.89	43.40	39.90	64.01	39.33	54.86	0.00	0.00	0.00	0.02	0.00	0.00

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2018	4-1-2018	1.2169	0.5766
2	4-2-2018	7-1-2018	0.4162	0.3280
3	7-2-2018	10-1-2018	0.6554	0.5686
4	10-2-2018	1-1-2019	0.9553	0.9241
5	1-2-2019	4-1-2019	0.5880	0.5194
		Highest	1.2169	0.9241

## 2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9552	0.0214	1.3234	1.1000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003	0.0000	9.2798	9.2798	2.2100e-003	1.3000e-004	9.3738
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	337.6677	337.6677	0.0254	6.7400e-003	340.3112
Mobile	0.1257	0.7671	1.3739	6.0500e-003	0.6119	4.2200e-003	0.6161	0.1645	3.9300e-003	0.1685	0.0000	560.5515	560.5515	0.0196	0.0000	561.0408
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	5.6664	16.0126	21.6791	0.0211	0.0127	25.9775
<b>Total</b>	<b>1.0913</b>	<b>0.8793</b>	<b>2.7442</b>	<b>6.7300e-003</b>	<b>0.6119</b>	<b>0.0193</b>	<b>0.6312</b>	<b>0.1645</b>	<b>0.0190</b>	<b>0.1835</b>	<b>26.9805</b>	<b>923.5116</b>	<b>950.4921</b>	<b>1.3279</b>	<b>0.0195</b>	<b>989.5080</b>



## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**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	0.9552	0.0214	1.3234	1.1000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003	0.0000	9.2798	9.2798	2.2100e-003	1.3000e-004	9.3738
Energy	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	335.1820	335.1820	0.0251	6.6900e-003	337.8040
Mobile	0.1257	0.7671	1.3739	6.0500e-003	0.6119	4.2200e-003	0.6161	0.1645	3.9300e-003	0.1685	0.0000	560.5515	560.5515	0.0196	0.0000	561.0408
Waste						0.0000	0.0000		0.0000	0.0000	21.3141	0.0000	21.3141	1.2596	0.0000	52.8047
Water						0.0000	0.0000		0.0000	0.0000	4.5332	13.4513	17.9844	0.0170	0.0101	21.4288
<b>Total</b>	<b>1.0913</b>	<b>0.8793</b>	<b>2.7442</b>	<b>6.7300e-003</b>	<b>0.6119</b>	<b>0.0193</b>	<b>0.6312</b>	<b>0.1645</b>	<b>0.0190</b>	<b>0.1835</b>	<b>25.8472</b>	<b>918.4646</b>	<b>944.3118</b>	<b>1.3235</b>	<b>0.0170</b>	<b>982.4521</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>4.20</b>	<b>0.55</b>	<b>0.65</b>	<b>0.33</b>	<b>13.11</b>	<b>0.71</b>

**3.0 Construction Detail****Construction Phase**

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2018	1/8/2018	5	5	
2	Site Preparation	Site Preparation	1/10/2018	2/6/2018	5	20	
3	Grading	Grading	1/10/2018	2/6/2018	5	20	
4	Trenching	Trenching	2/10/2018	5/14/2018	5	66	
5	Building Construction	Building Construction	5/10/2018	9/10/2018	5	88	
6	Architectural Coating	Architectural Coating	9/10/2018	2/8/2019	5	110	
7	Paving	Paving	2/10/2019	3/12/2019	5	22	

**Acres of Grading (Site Preparation Phase): 10**

**Acres of Grading (Grading Phase): 10**

**Acres of Paving: 0**

**Residential Indoor: 349,689; Residential Outdoor: 116,563; Non-Residential Indoor: 37,283; Non-Residential Outdoor: 12,428; Striped Parking Area: 6,144 (Architectural Coating – sqft)**

**OffRoad Equipment**

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	1.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	0	0.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	63	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	2	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	10.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	312.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	179.00	40.00	800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	36.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	64.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

**3.1 Mitigation Measures Construction**

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.2 Demolition - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0700e-003	0.0000	1.0700e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0926	0.0523	9.0000e-005		4.6400e-003	4.6400e-003		4.2700e-003	4.2700e-003	0.0000	8.1462	8.1462	2.5400e-003	0.0000	8.2096
<b>Total</b>	<b>8.6600e-003</b>	<b>0.0926</b>	<b>0.0523</b>	<b>9.0000e-005</b>	<b>1.0700e-003</b>	<b>4.6400e-003</b>	<b>5.7100e-003</b>	<b>1.6000e-004</b>	<b>4.2700e-003</b>	<b>4.4300e-003</b>	<b>0.0000</b>	<b>8.1462</b>	<b>8.1462</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2096</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7200e-003	3.5000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3937	0.3937	3.0000e-005	0.0000	0.3943
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.6400e-003	0.0000	2.9000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2881	0.2881	1.0000e-005	0.0000	0.2884
<b>Total</b>	<b>2.6000e-004</b>	<b>1.8900e-003</b>	<b>1.9900e-003</b>	<b>0.0000</b>	<b>3.7000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.6818</b>	<b>0.6818</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.6828</b>

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**3.2 Demolition - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.8000e-004	0.0000	4.8000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0430	0.0579	9.0000e-005		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	8.1462	8.1462	2.5400e-003	0.0000	8.2096
<b>Total</b>	<b>2.1900e-003</b>	<b>0.0430</b>	<b>0.0579</b>	<b>9.0000e-005</b>	<b>4.8000e-004</b>	<b>1.9600e-003</b>	<b>2.4400e-003</b>	<b>4.0000e-005</b>	<b>1.9600e-003</b>	<b>2.0000e-003</b>	<b>0.0000</b>	<b>8.1462</b>	<b>8.1462</b>	<b>2.5400e-003</b>	<b>0.0000</b>	<b>8.2096</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7200e-003	3.5000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3937	0.3937	3.0000e-005	0.0000	0.3943
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.6400e-003	0.0000	2.9000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2881	0.2881	1.0000e-005	0.0000	0.2884
<b>Total</b>	<b>2.6000e-004</b>	<b>1.8900e-003</b>	<b>1.9900e-003</b>	<b>0.0000</b>	<b>3.7000e-004</b>	<b>1.0000e-005</b>	<b>3.9000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.6818</b>	<b>0.6818</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.6828</b>

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**3.3 Site Preparation - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1860	0.0000	0.1860	0.0999	0.0000	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5533	0.2439	4.5000e-004		0.0281	0.0281		0.0258	0.0258	0.0000	40.8375	40.8375	0.0127	0.0000	41.1553
<b>Total</b>	<b>0.0508</b>	<b>0.5533</b>	<b>0.2439</b>	<b>4.5000e-004</b>	<b>0.1860</b>	<b>0.0281</b>	<b>0.2141</b>	<b>0.0999</b>	<b>0.0258</b>	<b>0.1257</b>	<b>0.0000</b>	<b>40.8375</b>	<b>40.8375</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1553</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.9000e-004	8.7600e-003	2.0000e-005	1.5700e-003	1.0000e-005	1.5800e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5365	1.5365	7.0000e-005	0.0000	1.5383
<b>Total</b>	<b>1.1400e-003</b>	<b>8.9000e-004</b>	<b>8.7600e-003</b>	<b>2.0000e-005</b>	<b>1.5700e-003</b>	<b>1.0000e-005</b>	<b>1.5800e-003</b>	<b>4.2000e-004</b>	<b>1.0000e-005</b>	<b>4.3000e-004</b>	<b>0.0000</b>	<b>1.5365</b>	<b>1.5365</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>1.5383</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.3 Site Preparation - 2018****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					0.0837	0.0000	0.0837	0.0225	0.0000	0.0225	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0109	0.2220	0.2648	4.5000e-004		0.0107	0.0107		0.0107	0.0107	0.0000	40.8374	40.8374	0.0127	0.0000	41.1552
<b>Total</b>	<b>0.0109</b>	<b>0.2220</b>	<b>0.2648</b>	<b>4.5000e-004</b>	<b>0.0837</b>	<b>0.0107</b>	<b>0.0943</b>	<b>0.0225</b>	<b>0.0107</b>	<b>0.0331</b>	<b>0.0000</b>	<b>40.8374</b>	<b>40.8374</b>	<b>0.0127</b>	<b>0.0000</b>	<b>41.1552</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.9000e-004	8.7600e-003	2.0000e-005	1.5700e-003	1.0000e-005	1.5800e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5365	1.5365	7.0000e-005	0.0000	1.5383
<b>Total</b>	<b>1.1400e-003</b>	<b>8.9000e-004</b>	<b>8.7600e-003</b>	<b>2.0000e-005</b>	<b>1.5700e-003</b>	<b>1.0000e-005</b>	<b>1.5800e-003</b>	<b>4.2000e-004</b>	<b>1.0000e-005</b>	<b>4.3000e-004</b>	<b>0.0000</b>	<b>1.5365</b>	<b>1.5365</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>1.5383</b>



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**3.4 Grading - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0657	0.0000	0.0657	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.3067	0.1658	3.0000e-004		0.0155	0.0155		0.0143	0.0143	0.0000	27.1069	27.1069	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>0.0277</b>	<b>0.3067</b>	<b>0.1658</b>	<b>3.0000e-004</b>	<b>0.0657</b>	<b>0.0155</b>	<b>0.0812</b>	<b>0.0337</b>	<b>0.0143</b>	<b>0.0480</b>	<b>0.0000</b>	<b>27.1069</b>	<b>27.1069</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5700e-003	0.0536	0.0108	1.3000e-004	2.5900e-003	2.9000e-004	2.8800e-003	7.1000e-004	2.8000e-004	9.9000e-004	0.0000	12.2840	12.2840	7.8000e-004	0.0000	12.3035
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	8.6000e-004	6.7000e-004	6.5700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1524	1.1524	5.0000e-005	0.0000	1.1537
<b>Total</b>	<b>2.4300e-003</b>	<b>0.0542</b>	<b>0.0174</b>	<b>1.4000e-004</b>	<b>3.7700e-003</b>	<b>3.0000e-004</b>	<b>4.0700e-003</b>	<b>1.0200e-003</b>	<b>2.9000e-004</b>	<b>1.3100e-003</b>	<b>0.0000</b>	<b>13.4364</b>	<b>13.4364</b>	<b>8.3000e-004</b>	<b>0.0000</b>	<b>13.4572</b>

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**3.4 Grading - 2018****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					0.0296	0.0000	0.0296	7.5800e-003	0.0000	7.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2600e-003	0.1484	0.1899	3.0000e-004		7.5600e-003	7.5600e-003		7.5600e-003	7.5600e-003	0.0000	27.1068	27.1068	8.4400e-003	0.0000	27.3178
<b>Total</b>	<b>7.2600e-003</b>	<b>0.1484</b>	<b>0.1899</b>	<b>3.0000e-004</b>	<b>0.0296</b>	<b>7.5600e-003</b>	<b>0.0371</b>	<b>7.5800e-003</b>	<b>7.5600e-003</b>	<b>0.0151</b>	<b>0.0000</b>	<b>27.1068</b>	<b>27.1068</b>	<b>8.4400e-003</b>	<b>0.0000</b>	<b>27.3178</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5700e-003	0.0536	0.0108	1.3000e-004	2.5900e-003	2.9000e-004	2.8800e-003	7.1000e-004	2.8000e-004	9.9000e-004	0.0000	12.2840	12.2840	7.8000e-004	0.0000	12.3035
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	8.6000e-004	6.7000e-004	6.5700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.1524	1.1524	5.0000e-005	0.0000	1.1537
<b>Total</b>	<b>2.4300e-003</b>	<b>0.0542</b>	<b>0.0174</b>	<b>1.4000e-004</b>	<b>3.7700e-003</b>	<b>3.0000e-004</b>	<b>4.0700e-003</b>	<b>1.0200e-003</b>	<b>2.9000e-004</b>	<b>1.3100e-003</b>	<b>0.0000</b>	<b>13.4364</b>	<b>13.4364</b>	<b>8.3000e-004</b>	<b>0.0000</b>	<b>13.4572</b>

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**3.5 Trenching - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.1890	0.1852	2.7000e-004		0.0111	0.0111		0.0102	0.0102	0.0000	24.9185	24.9185	7.7600e-003	0.0000	25.1124
<b>Total</b>	<b>0.0183</b>	<b>0.1890</b>	<b>0.1852</b>	<b>2.7000e-004</b>		<b>0.0111</b>	<b>0.0111</b>		<b>0.0102</b>	<b>0.0102</b>	<b>0.0000</b>	<b>24.9185</b>	<b>24.9185</b>	<b>7.7600e-003</b>	<b>0.0000</b>	<b>25.1124</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.3000e-004	7.2300e-003	1.0000e-005	1.2900e-003	1.0000e-005	1.3100e-003	3.4000e-004	1.0000e-005	3.6000e-004	0.0000	1.2677	1.2677	6.0000e-005	0.0000	1.2691
<b>Total</b>	<b>9.4000e-004</b>	<b>7.3000e-004</b>	<b>7.2300e-003</b>	<b>1.0000e-005</b>	<b>1.2900e-003</b>	<b>1.0000e-005</b>	<b>1.3100e-003</b>	<b>3.4000e-004</b>	<b>1.0000e-005</b>	<b>3.6000e-004</b>	<b>0.0000</b>	<b>1.2677</b>	<b>1.2677</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.2691</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.5 Trenching - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7000e-003	0.1383	0.2066	2.7000e-004		7.9200e-003	7.9200e-003		7.9200e-003	7.9200e-003	0.0000	24.9184	24.9184	7.7600e-003	0.0000	25.1124
<b>Total</b>	<b>6.7000e-003</b>	<b>0.1383</b>	<b>0.2066</b>	<b>2.7000e-004</b>		<b>7.9200e-003</b>	<b>7.9200e-003</b>		<b>7.9200e-003</b>	<b>7.9200e-003</b>	<b>0.0000</b>	<b>24.9184</b>	<b>24.9184</b>	<b>7.7600e-003</b>	<b>0.0000</b>	<b>25.1124</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.3000e-004	7.2300e-003	1.0000e-005	1.2900e-003	1.0000e-005	1.3100e-003	3.4000e-004	1.0000e-005	3.6000e-004	0.0000	1.2677	1.2677	6.0000e-005	0.0000	1.2691
<b>Total</b>	<b>9.4000e-004</b>	<b>7.3000e-004</b>	<b>7.2300e-003</b>	<b>1.0000e-005</b>	<b>1.2900e-003</b>	<b>1.0000e-005</b>	<b>1.3100e-003</b>	<b>3.4000e-004</b>	<b>1.0000e-005</b>	<b>3.6000e-004</b>	<b>0.0000</b>	<b>1.2677</b>	<b>1.2677</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.2691</b>

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.6 Building Construction - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.2454	0.1738	2.3000e-004		0.0182	0.0182		0.0168	0.0168	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>0.0267</b>	<b>0.2454</b>	<b>0.1738</b>	<b>2.3000e-004</b>		<b>0.0182</b>	<b>0.0182</b>		<b>0.0168</b>	<b>0.0168</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0300e-003	0.1374	0.0278	3.2000e-004	6.6400e-003	7.5000e-004	7.3900e-003	1.8200e-003	7.2000e-004	2.5400e-003	0.0000	31.4974	31.4974	2.0000e-003	0.0000	31.5475
Vendor	0.0101	0.2466	0.0690	4.8000e-004	0.0114	2.1700e-003	0.0136	3.3000e-003	2.0700e-003	5.3700e-003	0.0000	45.8582	45.8582	3.1400e-003	0.0000	45.9368
Worker	0.0451	0.0350	0.3451	6.7000e-004	0.0618	5.4000e-004	0.0624	0.0165	5.0000e-004	0.0170	0.0000	60.5091	60.5091	2.6900e-003	0.0000	60.5765
<b>Total</b>	<b>0.0592</b>	<b>0.4190</b>	<b>0.4419</b>	<b>1.4700e-003</b>	<b>0.0799</b>	<b>3.4600e-003</b>	<b>0.0833</b>	<b>0.0216</b>	<b>3.2900e-003</b>	<b>0.0249</b>	<b>0.0000</b>	<b>137.8647</b>	<b>137.8647</b>	<b>7.8300e-003</b>	<b>0.0000</b>	<b>138.0607</b>

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**3.6 Building Construction - 2018****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7500e-003	0.1286	0.1702	2.3000e-004		8.5300e-003	8.5300e-003		8.5300e-003	8.5300e-003	0.0000	21.3127	21.3127	6.6300e-003	0.0000	21.4786
<b>Total</b>	<b>5.7500e-003</b>	<b>0.1286</b>	<b>0.1702</b>	<b>2.3000e-004</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>		<b>8.5300e-003</b>	<b>8.5300e-003</b>	<b>0.0000</b>	<b>21.3127</b>	<b>21.3127</b>	<b>6.6300e-003</b>	<b>0.0000</b>	<b>21.4786</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0300e-003	0.1374	0.0278	3.2000e-004	6.6400e-003	7.5000e-004	7.3900e-003	1.8200e-003	7.2000e-004	2.5400e-003	0.0000	31.4974	31.4974	2.0000e-003	0.0000	31.5475
Vendor	0.0101	0.2466	0.0690	4.8000e-004	0.0114	2.1700e-003	0.0136	3.3000e-003	2.0700e-003	5.3700e-003	0.0000	45.8582	45.8582	3.1400e-003	0.0000	45.9368
Worker	0.0451	0.0350	0.3451	6.7000e-004	0.0618	5.4000e-004	0.0624	0.0165	5.0000e-004	0.0170	0.0000	60.5091	60.5091	2.6900e-003	0.0000	60.5765
<b>Total</b>	<b>0.0592</b>	<b>0.4190</b>	<b>0.4419</b>	<b>1.4700e-003</b>	<b>0.0799</b>	<b>3.4600e-003</b>	<b>0.0833</b>	<b>0.0216</b>	<b>3.2900e-003</b>	<b>0.0249</b>	<b>0.0000</b>	<b>137.8647</b>	<b>137.8647</b>	<b>7.8300e-003</b>	<b>0.0000</b>	<b>138.0607</b>

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**3.7 Architectural Coating - 2018****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0178	0.1371	0.1443	2.3000e-004		8.9300e-003	8.9300e-003		8.8600e-003	8.8600e-003	0.0000	19.9948	19.9948	3.2400e-003	0.0000	20.0758
<b>Total</b>	<b>1.0241</b>	<b>0.1371</b>	<b>0.1443</b>	<b>2.3000e-004</b>		<b>8.9300e-003</b>	<b>8.9300e-003</b>		<b>8.8600e-003</b>	<b>8.8600e-003</b>	<b>0.0000</b>	<b>19.9948</b>	<b>19.9948</b>	<b>3.2400e-003</b>	<b>0.0000</b>	<b>20.0758</b>

**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	8.3500e-003	6.4900e-003	0.0639	1.2000e-004	0.0114	1.0000e-004	0.0115	3.0500e-003	9.0000e-005	3.1400e-003	0.0000	11.2014	11.2014	5.0000e-004	0.0000	11.2139
<b>Total</b>	<b>8.3500e-003</b>	<b>6.4900e-003</b>	<b>0.0639</b>	<b>1.2000e-004</b>	<b>0.0114</b>	<b>1.0000e-004</b>	<b>0.0115</b>	<b>3.0500e-003</b>	<b>9.0000e-005</b>	<b>3.1400e-003</b>	<b>0.0000</b>	<b>11.2014</b>	<b>11.2014</b>	<b>5.0000e-004</b>	<b>0.0000</b>	<b>11.2139</b>

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**3.7 Architectural Coating - 2018****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	1.0063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8800e-003	0.1115	0.1506	2.3000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003	0.0000	19.9947	19.9947	3.2400e-003	0.0000	20.0758
<b>Total</b>	<b>1.0112</b>	<b>0.1115</b>	<b>0.1506</b>	<b>2.3000e-004</b>		<b>7.8100e-003</b>	<b>7.8100e-003</b>		<b>7.8100e-003</b>	<b>7.8100e-003</b>	<b>0.0000</b>	<b>19.9947</b>	<b>19.9947</b>	<b>3.2400e-003</b>	<b>0.0000</b>	<b>20.0758</b>

**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	8.3500e-003	6.4900e-003	0.0639	1.2000e-004	0.0114	1.0000e-004	0.0115	3.0500e-003	9.0000e-005	3.1400e-003	0.0000	11.2014	11.2014	5.0000e-004	0.0000	11.2139
<b>Total</b>	<b>8.3500e-003</b>	<b>6.4900e-003</b>	<b>0.0639</b>	<b>1.2000e-004</b>	<b>0.0114</b>	<b>1.0000e-004</b>	<b>0.0115</b>	<b>3.0500e-003</b>	<b>9.0000e-005</b>	<b>3.1400e-003</b>	<b>0.0000</b>	<b>11.2014</b>	<b>11.2014</b>	<b>5.0000e-004</b>	<b>0.0000</b>	<b>11.2139</b>



## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

**3.7 Architectural Coating - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7400e-003	0.0454	0.0514	8.0000e-005		2.7300e-003	2.7300e-003		2.7100e-003	2.7100e-003	0.0000	7.1230	7.1230	1.1100e-003	0.0000	7.1507
<b>Total</b>	<b>0.3660</b>	<b>0.0454</b>	<b>0.0514</b>	<b>8.0000e-005</b>		<b>2.7300e-003</b>	<b>2.7300e-003</b>		<b>2.7100e-003</b>	<b>2.7100e-003</b>	<b>0.0000</b>	<b>7.1230</b>	<b>7.1230</b>	<b>1.1100e-003</b>	<b>0.0000</b>	<b>7.1507</b>

**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	2.7100e-003	2.0400e-003	0.0203	4.0000e-005	4.1000e-003	3.0000e-005	4.1300e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.8940	3.8940	1.6000e-004	0.0000	3.8980
<b>Total</b>	<b>2.7100e-003</b>	<b>2.0400e-003</b>	<b>0.0203</b>	<b>4.0000e-005</b>	<b>4.1000e-003</b>	<b>3.0000e-005</b>	<b>4.1300e-003</b>	<b>1.0900e-003</b>	<b>3.0000e-005</b>	<b>1.1200e-003</b>	<b>0.0000</b>	<b>3.8940</b>	<b>3.8940</b>	<b>1.6000e-004</b>	<b>0.0000</b>	<b>3.8980</b>

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**3.7 Architectural Coating - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7500e-003	0.0399	0.0539	8.0000e-005		2.8000e-003	2.8000e-003		2.8000e-003	2.8000e-003	0.0000	7.1230	7.1230	1.1100e-003	0.0000	7.1507
<b>Total</b>	<b>0.3620</b>	<b>0.0399</b>	<b>0.0539</b>	<b>8.0000e-005</b>		<b>2.8000e-003</b>	<b>2.8000e-003</b>		<b>2.8000e-003</b>	<b>2.8000e-003</b>	<b>0.0000</b>	<b>7.1230</b>	<b>7.1230</b>	<b>1.1100e-003</b>	<b>0.0000</b>	<b>7.1507</b>

**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	2.7100e-003	2.0400e-003	0.0203	4.0000e-005	4.1000e-003	3.0000e-005	4.1300e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.8940	3.8940	1.6000e-004	0.0000	3.8980
<b>Total</b>	<b>2.7100e-003</b>	<b>2.0400e-003</b>	<b>0.0203</b>	<b>4.0000e-005</b>	<b>4.1000e-003</b>	<b>3.0000e-005</b>	<b>4.1300e-003</b>	<b>1.0900e-003</b>	<b>3.0000e-005</b>	<b>1.1200e-003</b>	<b>0.0000</b>	<b>3.8940</b>	<b>3.8940</b>	<b>1.6000e-004</b>	<b>0.0000</b>	<b>3.8980</b>

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**3.8 Paving - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.1671	0.1615	2.5000e-004		9.4200e-003	9.4200e-003		8.6900e-003	8.6900e-003	0.0000	21.9547	21.9547	6.7300e-003	0.0000	22.1230
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0167</b>	<b>0.1671</b>	<b>0.1615</b>	<b>2.5000e-004</b>		<b>9.4200e-003</b>	<b>9.4200e-003</b>		<b>8.6900e-003</b>	<b>8.6900e-003</b>	<b>0.0000</b>	<b>21.9547</b>	<b>21.9547</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1230</b>

**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	3.0000e-004	0.0103	2.1100e-003	3.0000e-005	5.3000e-004	5.0000e-005	5.8000e-004	1.5000e-004	5.0000e-005	1.9000e-004	0.0000	2.4902	2.4902	1.6000e-004	0.0000	2.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.6000e-004	8.5600e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.6412	1.6412	7.0000e-005	0.0000	1.6428
<b>Total</b>	<b>1.4400e-003</b>	<b>0.0112</b>	<b>0.0107</b>	<b>5.0000e-005</b>	<b>2.2600e-003</b>	<b>6.0000e-005</b>	<b>2.3200e-003</b>	<b>6.1000e-004</b>	<b>6.0000e-005</b>	<b>6.6000e-004</b>	<b>0.0000</b>	<b>4.1314</b>	<b>4.1314</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>4.1370</b>

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**3.8 Paving - 2019****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7300e-003	0.1188	0.1768	2.5000e-004		6.8500e-003	6.8500e-003		6.8500e-003	6.8500e-003	0.0000	21.9546	21.9546	6.7300e-003	0.0000	22.1229
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>5.7300e-003</b>	<b>0.1188</b>	<b>0.1768</b>	<b>2.5000e-004</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>		<b>6.8500e-003</b>	<b>6.8500e-003</b>	<b>0.0000</b>	<b>21.9546</b>	<b>21.9546</b>	<b>6.7300e-003</b>	<b>0.0000</b>	<b>22.1229</b>

**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	3.0000e-004	0.0103	2.1100e-003	3.0000e-005	5.3000e-004	5.0000e-005	5.8000e-004	1.5000e-004	5.0000e-005	1.9000e-004	0.0000	2.4902	2.4902	1.6000e-004	0.0000	2.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	8.6000e-004	8.5600e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.6412	1.6412	7.0000e-005	0.0000	1.6428
<b>Total</b>	<b>1.4400e-003</b>	<b>0.0112</b>	<b>0.0107</b>	<b>5.0000e-005</b>	<b>2.2600e-003</b>	<b>6.0000e-005</b>	<b>2.3200e-003</b>	<b>6.1000e-004</b>	<b>6.0000e-005</b>	<b>6.6000e-004</b>	<b>0.0000</b>	<b>4.1314</b>	<b>4.1314</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>4.1370</b>

**4.0 Operational Detail - Mobile**

## Haystack, Petaluma, AQ - Sonoma-San Francisco County, Annual

## 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	0.1257	0.7671	1.3739	6.0500e-003	0.6119	4.2200e-003	0.6161	0.1645	3.9300e-003	0.1685	0.0000	560.5515	560.5515	0.0196	0.0000	561.0408
Unmitigated	0.1257	0.7671	1.3739	6.0500e-003	0.6119	4.2200e-003	0.6161	0.1645	3.9300e-003	0.1685	0.0000	560.5515	560.5515	0.0196	0.0000	561.0408

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	731.58	703.10	644.36	1,651,488	1,651,488
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Total	731.58	703.10	644.36	1,651,488	1,651,488

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

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**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.625329	0.031298	0.162135	0.089092	0.014618	0.004632	0.032111	0.030354	0.003196	0.001373	0.004305	0.000897	0.000662
Enclosed Parking with Elevator	0.625329	0.031298	0.162135	0.089092	0.014618	0.004632	0.032111	0.030354	0.003196	0.001373	0.004305	0.000897	0.000662
General Office Building	0.625329	0.031298	0.162135	0.089092	0.014618	0.004632	0.032111	0.030354	0.003196	0.001373	0.004305	0.000897	0.000662

**5.0 Energy Detail**

Historical Energy Use: N

**5.1 Mitigation Measures Energy**

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	231.4055	231.4055	0.0231	4.7900e-003	233.4108
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	233.8912	233.8912	0.0234	4.8400e-003	235.9179
NaturalGas Mitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932
NaturalGas Unmitigated	0.0105	0.0908	0.0469	5.7000e-004		7.2400e-003	7.2400e-003		7.2400e-003	7.2400e-003	0.0000	103.7765	103.7765	1.9900e-003	1.9000e-003	104.3932

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**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>

**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	1.53782e+006	8.2900e-003	0.0709	0.0302	4.5000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.0000	82.0640	82.0640	1.5700e-003	1.5000e-003	82.5517
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	406876	2.1900e-003	0.0199	0.0168	1.2000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	21.7125	21.7125	4.2000e-004	4.0000e-004	21.8415
<b>Total</b>		<b>0.0105</b>	<b>0.0908</b>	<b>0.0469</b>	<b>5.7000e-004</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>		<b>7.2500e-003</b>	<b>7.2500e-003</b>	<b>0.0000</b>	<b>103.7765</b>	<b>103.7765</b>	<b>1.9900e-003</b>	<b>1.9000e-003</b>	<b>104.3932</b>

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**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	734846	96.6630	9.6700e-003	2.0000e-003	97.5006
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>233.8912</b>	<b>0.0234</b>	<b>4.8400e-003</b>	<b>235.9179</b>

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	715950	94.1774	9.4200e-003	1.9500e-003	94.9935
Enclosed Parking with Elevator	600064	78.9335	7.8900e-003	1.6300e-003	79.6175
General Office Building	443165	58.2947	5.8300e-003	1.2100e-003	58.7998
<b>Total</b>		<b>231.4055</b>	<b>0.0231</b>	<b>4.7900e-003</b>	<b>233.4108</b>

**6.0 Area Detail**



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**6.1 Mitigation Measures Area**

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9552	0.0214	1.3234	1.1000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003	0.0000	9.2798	9.2798	2.2100e-003	1.3000e-004	9.3738
Unmitigated	0.9552	0.0214	1.3234	1.1000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003	0.0000	9.2798	9.2798	2.2100e-003	1.3000e-004	9.3738

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**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1158	7.1158	1.4000e-004	1.3000e-004	7.1581
Landscaping	0.0397	0.0152	1.3208	7.0000e-005		7.3400e-003	7.3400e-003		7.3400e-003	7.3400e-003	0.0000	2.1639	2.1639	2.0700e-003	0.0000	2.2157
<b>Total</b>	<b>0.9552</b>	<b>0.0214</b>	<b>1.3234</b>	<b>1.1000e-004</b>		<b>7.8400e-003</b>	<b>7.8400e-003</b>		<b>7.8400e-003</b>	<b>7.8400e-003</b>	<b>0.0000</b>	<b>9.2798</b>	<b>9.2798</b>	<b>2.2100e-003</b>	<b>1.3000e-004</b>	<b>9.3738</b>

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**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	0.1367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.2000e-004	6.1400e-003	2.6100e-003	4.0000e-005		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	7.1158	7.1158	1.4000e-004	1.3000e-004	7.1581
Landscaping	0.0397	0.0152	1.3208	7.0000e-005		7.3400e-003	7.3400e-003		7.3400e-003	7.3400e-003	0.0000	2.1639	2.1639	2.0700e-003	0.0000	2.2157
<b>Total</b>	<b>0.9552</b>	<b>0.0214</b>	<b>1.3234</b>	<b>1.1000e-004</b>		<b>7.8400e-003</b>	<b>7.8400e-003</b>		<b>7.8400e-003</b>	<b>7.8400e-003</b>	<b>0.0000</b>	<b>9.2798</b>	<b>9.2798</b>	<b>2.2100e-003</b>	<b>1.3000e-004</b>	<b>9.3738</b>

**7.0 Water Detail****7.1 Mitigation Measures Water**

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	17.9844	0.0170	0.0101	21.4288
Unmitigated	21.6791	0.0211	0.0127	25.9775

**7.2 Water by Land Use****Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	11.5974 / 7.31141	15.7241	0.0153	9.1600e-003	18.8369
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	4.41846 / 2.70809	5.9550	5.8200e-003	3.4900e-003	7.1406
<b>Total</b>		<b>21.6791</b>	<b>0.0211</b>	<b>0.0127</b>	<b>25.9775</b>

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**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	9.27793 / 6.86542	13.0471	0.0123	7.3400e-003	15.5415
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	3.53477 / 2.5429	4.9373	4.6700e-003	2.8000e-003	5.8873
<b>Total</b>		<b>17.9844</b>	<b>0.0169</b>	<b>0.0101</b>	<b>21.4288</b>

**8.0 Waste Detail****8.1 Mitigation Measures Waste**

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**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	21.3141	1.2596	0.0000	52.8047
Unmitigated	21.3141	1.2596	0.0000	52.8047

**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

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**8.2 Waste by Land Use****Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	81.88	16.6209	0.9823	0.0000	41.1776
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	23.12	4.6932	0.2774	0.0000	11.6271
<b>Total</b>		<b>21.3141</b>	<b>1.2596</b>	<b>0.0000</b>	<b>52.8047</b>

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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**10.0 Stationary Equipment****Fire Pumps and Emergency Generators**

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

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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## **11.0 Vegetation**

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## Attachment 2: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.<sup>7</sup> These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.<sup>8</sup> This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.<sup>9</sup> Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

### Cancer Risk

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

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

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<sup>7</sup> OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

<sup>8</sup> CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

<sup>9</sup> BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

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

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

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

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

Where:

CPF = Cancer potency factor (mg/kg-day)<sup>-1</sup>

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

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

Where:

C<sub>air</sub> = concentration in air (µg/m<sup>3</sup>)

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10<sup>-6</sup> = Conversion factor

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

Parameter	Exposure Type →	Infant		Child		Adult
	Age Range →	3 <sup>rd</sup> Trimester	0<2	2 < 9	2 < 16	16 - 30
DPM Cancer Potency Factor (mg/kg-day) <sup>-1</sup>		1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80 <sup>th</sup> Percentile Rate		273	758	631	572	261
Daily Breathing Rate (L/kg-day) 95 <sup>th</sup> Percentile Rate		361	1,090	861	745	335
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

## Non-Cancer Hazards

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

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

## Annual PM<sub>2.5</sub> Concentrations

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

### Attachment 3: Construction Health Risk Calculations

#### Haystack Pacifica Mixed Use, Petaluma, CA

##### DPM Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions			Modeled Area (m <sup>2</sup> )	DPM Emission Rate (g/s/m <sup>2</sup> )
				(lb/yr)	(lb/hr)	(g/s)		
2018-2019	Construction	0.0994	CON_DPM	198.8	0.04539	5.72E-03	16,425	3.48E-07

##### Construction Hours

hr/day =	12	(7am - 4pm)
days/yr =	365	
hours/year =	4380	

##### PM2.5 Fugitive Dust Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions			Modeled Area (m <sup>2</sup> )	PM2.5 Emission Rate g/s/m <sup>2</sup>
				(lb/yr)	(lb/hr)	(g/s)		
2018-2019	Construction	CON_FUG	0.13625	272.5	0.06221	7.84E-03	16,425	4.77E-07

##### Construction Hours

hr/day =	12	(7am - 4pm)
days/yr =	365	
hours/year =	4380	

#### Haystack Pacifica Mixed Use, Petaluma, CA - Construction Health Impact Summary

##### Maximum Impacts at MEI Location - Unmitigated

Emissions Year	Maximum Concentrations					Maximum Annual PM2.5 Concentration (µg/m³)
	Exhaust PM10/DPM (µg/m³)	Fugitive PM2.5 (µg/m³)	Cancer Risk (per million)		Hazard Index (-)	
			Infant/Child	Adult		
2018-2019	0.0102	0.0143	1.8	0.0	0.002	0.02

**Haystack Pacifica Mixed Use, Petaluma, CA - Construction Impacts - Without Mitigation**  
**Maximum DPM Cancer Risk and PM2.5 Calculations From Construction**  
**Impacts at Off-Site MEI Location - 4.5 meter receptor height**

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

Where: CPF = Cancer potency factor (mg/kg-day)<sup>-1</sup>

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C<sub>air</sub> x DBR x A x (EF/365) x 10<sup>-6</sup>

Where: C<sub>air</sub> = concentration in air (µg/m<sup>3</sup>)

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10<sup>-6</sup> = Conversion factor

**Values**

	Infant/Child				Adult
Age -->	3rd Trimester	0 - 2	2 - 9	2 - 16	16 - 30
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

**Construction Cancer Risk by Year - Maximum Impact Receptor Location**

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information			Infant/Child Cancer Risk (per million)	Adult - Exposure Information			Adult Cancer Risk (per million)	Maximum	
			DPM Conc (ug/m3)		Age Sensitivity Factor		Modeled		Age Sensitivity Factor			
			Year	Annual			Year	Annual			Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2018-2019	0.0102	10	0.14	2018-2019	0.0102	-	-	0.0143	0.024
1	1	0 - 1	2018-2019	0.0102	10	1.68	2018-2019	0.0102	1	0.03		
2	1	1 - 2			10	0.00			1	0.00		
3	1	2 - 3			3	0.00			1	0.00		
4	1	3 - 4			3	0.00			1	0.00		
5	1	4 - 5			3	0.00			1	0.00		
6	1	5 - 6			3	0.00			1	0.00		
7	1	6 - 7			3	0.00			1	0.00		
8	1	7 - 8			3	0.00			1	0.00		
9	1	8 - 9			3	0.00			1	0.00		
10	1	9 - 10			3	0.00			1	0.00		
11	1	10 - 11			3	0.00			1	0.00		
12	1	11 - 12			3	0.00			1	0.00		
13	1	12 - 13			3	0.00			1	0.00		
14	1	13 - 14			3	0.00			1	0.00		
15	1	14 - 15			3	0.00			1	0.00		
16	1	15 - 16			3	0.00			1	0.00		
17	1	16-17			1	0.00			1	0.00		
18	1	17-18			1	0.00			1	0.00		
19	1	18-19			1	0.00			1	0.00		
20	1	19-20			1	0.00			1	0.00		
21	1	20-21			1	0.00			1	0.00		
22	1	21-22			1	0.00			1	0.00		
23	1	22-23			1	0.00			1	0.00		
24	1	23-24			1	0.00			1	0.00		
25	1	24-25			1	0.00			1	0.00		
26	1	25-26			1	0.00			1	0.00		
27	1	26-27			1	0.00			1	0.00		
28	1	27-28			1	0.00			1	0.00		
29	1	28-29			1	0.00			1	0.00		
30	1	29-30			1	0.00			1	0.00		
Total Increased Cancer Risk						1.8				0.03		

\* Third trimester of pregnancy

**Haystack Pacifica Mixed Use, Petaluma, CA - Construction Impacts - Without Mitigation**  
**Maximum DPM Cancer Risk and PM2.5 Calculations From Construction**  
**Impacts at Off-Site MEI Location - 7.5 meter receptor height**

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

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

Inhalation Dose = C<sub>air</sub> x DBR x A x (EF/365) x 10<sup>-6</sup>

Where: C<sub>air</sub> = concentration in air (µg/m<sup>3</sup>)  
 DBR = daily breathing rate (L/kg body weight-day)  
 A = Inhalation absorption factor  
 EF = Exposure frequency (days/year)  
 10<sup>-6</sup> = Conversion factor

Values

Age --> Parameter	Infant/Child				Adult
	3rd Trimester	0 - 2	2 - 9	2 - 16	16 - 30
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

**Construction Cancer Risk by Year - Maximum Impact Receptor Location**

Construction Cancer Risk by Year - Maximum Impact Receptor Location												
Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk (per million)	Adult - Exposure Information			Adult Cancer Risk (per million)	Maximum		
			DPM Conc (ug/m3)			Age Sensitivity Factor	Modeled			Age Sensitivity Factor	Fugitive PM2.5	Total PM2.5
			Year	Annual			DPM Conc (ug/m3)	Year				
0	0.25	-0.25 - 0*	2018-2019	0.0098	10	0.13	2018-2019	0.0098	-	-		
1	1	0 - 1	2018-2019	0.0098	10	1.60	2018-2019	0.0098	1	0.03	0.0140	
2	1	1 - 2			10	0.00			1	0.00	0.024	
3	1	2 - 3			3	0.00			1	0.00		
4	1	3 - 4			3	0.00			1	0.00		
5	1	4 - 5			3	0.00			1	0.00		
6	1	5 - 6			3	0.00			1	0.00		
7	1	6 - 7			3	0.00			1	0.00		
8	1	7 - 8			3	0.00			1	0.00		
9	1	8 - 9			3	0.00			1	0.00		
10	1	9 - 10			3	0.00			1	0.00		
11	1	10 - 11			3	0.00			1	0.00		
12	1	11 - 12			3	0.00			1	0.00		
13	1	12 - 13			3	0.00			1	0.00		
14	1	13 - 14			3	0.00			1	0.00		
15	1	14 - 15			3	0.00			1	0.00		
16	1	15 - 16			3	0.00			1	0.00		
17	1	16-17			1	0.00			1	0.00		
18	1	17-18			1	0.00			1	0.00		
19	1	18-19			1	0.00			1	0.00		
20	1	19-20			1	0.00			1	0.00		
21	1	20-21			1	0.00			1	0.00		
22	1	21-22			1	0.00			1	0.00		
23	1	22-23			1	0.00			1	0.00		
24	1	23-24			1	0.00			1	0.00		
25	1	24-25			1	0.00			1	0.00		
26	1	25-26			1	0.00			1	0.00		
27	1	26-27			1	0.00			1	0.00		
28	1	27-28			1	0.00			1	0.00		
29	1	28-29			1	0.00			1	0.00		
30	1	29-30			1	0.00			1	0.00		
Total Increased Cancer Risk						1.7				0.03		

\* Third trimester of pregnancy