

# ***SAN PEDRO TERRACE RESIDENTIAL DEVELOPMENT COMMUNITY RISK ASSESSMENT***

***Pacifica, California***

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**Project: 17-018**

## **Introduction**

The purpose of this report is to address the community risk impacts associated with the San Pedro Terrace residential development project in Pacifica. The approximately 2.42-acre site is located at the end of San Pedro Terrace Road, northwest of the Linda Mar Rehabilitation Facility. The project proposes the development of six single-family dwelling on the vacant triangular lot. The proposed six single-family lots would range in size from 5,035 to 36,104 square feet (sf). Access to the site and extension of utilities into the site would be facilitated by a proposed 16,783 sf gated private street located along the southwestern property line of the project site.

Air pollutant emissions associated with construction of the project were modeled. In addition, the potential construction health risk impacts to nearby sensitive receptors were evaluated. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).

## **Setting**

The project is located in the San Mateo County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM<sub>10</sub>), and fine particulate matter (PM<sub>2.5</sub>).

### 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.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.<sup>1</sup> The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the CARB (a part of the California Environmental Protection Agency [EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has recently published California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.<sup>2</sup> *Attachment 1* includes detailed community risk modeling methodology.

## 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

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<sup>1</sup> Available online: <http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>. Accessed: November 21, 2014.

<sup>2</sup> Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.

facilities, elder care facilities, elementary and schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors include the Linda Mar Rehabilitation Center to the south and single-family residences to the east of the project site.

### Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011). The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1.

The BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires the BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds (Cal. Court of Appeal, First Appellate District, Case Nos. A135335 & A136212). CBIA sought review by the California Supreme Court on three issues, including the appellate court's decision to uphold the BAAQMD's adoption of the thresholds, and the Court granted review on just one: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users of a proposed project? In December 2015, the Supreme Court determined that an analysis of the impacts of the environment on a project – known as “CEQA-in-reverse” – is only required under two limited circumstances: (1) when a statute provides an express legislative directive to consider such impacts; and (2) when a proposed project risks exacerbating environmental hazards or conditions that already exist (Cal. Supreme Court Case No. S213478). The Supreme Court reversed the Court of Appeal's decision and remanded the matter back to the appellate court to reconsider the case in light of the Supreme Court's ruling. Because the Supreme Court's holding concerns the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment), and not the science behind the thresholds, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

**Table 1. Air Quality Significance Thresholds**

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
<b>Criteria Air Pollutants</b>			
ROG	54	54	10
NO <sub>x</sub>	54	54	10
PM <sub>10</sub>	82 (Exhaust)	82	15
PM <sub>2.5</sub>	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
<b>Health Risks and Hazards for Single Sources</b>			
Excess Cancer Risk	>10 per one million		
Hazard Index	>1.0		
Incremental annual PM <sub>2.5</sub>	>0.3 µg/m <sup>3</sup>		
<b>Health Risks and Hazards for Combined Sources (Cumulative from all sources within 1,000 foot zone of influence)</b>			
Excess Cancer Risk	>100 per one million		
Hazard Index	>10.0		
Annual Average PM <sub>2.5</sub>	>0.8 µg/m <sup>3</sup>		
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			

**Impact:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable State or federal ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? *Less than significant with construction-period mitigation measures.*

The Bay Area is considered a non-attainment area for ground-level ozone and PM<sub>2.5</sub> under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM<sub>10</sub> under the California Clean Air Act, but not the federal act. The area has attained both State and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM<sub>10</sub>, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO<sub>x</sub>), PM<sub>10</sub>, and PM<sub>2.5</sub> and apply to both construction period and operational period impacts.

The California Emissions Estimator Model (CalEEMod) Version 2016.3.1 was used to estimate emissions from construction and operation of the site assuming full build-out of the project. The project land use types and size, and anticipated construction schedule were input to CalEEMod.

### Construction period emissions

CalEEMod provided annual emissions for construction. CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and schedule, was based on information provided by the project applicant. The proposed project land uses were input into CalEEMod, which included: 6 dwelling units entered as “Single-Family Housing” on a 2.42-acre site.

Approximately 400 cubic yards (cy) of soil export is anticipated during site preparation and 1,250 cy of soil export is anticipated during grading, and was entered into the model. Demolition of 40 tons of pavement is anticipated and was entered into the model. Additionally, 110 cement truck round-trips during building construction and 20 paving roundtrips are expected and were entered into the model. Site clearing for this project is expected to generate about 20 truck trips which was added to the building construction truck trips. Modeling assumed 16 cy/truck and 20 tons/truck.

The construction schedule assumes that the project would be built out over a period of approximately 12 months beginning in June 2017, or an estimated 260 construction workdays (assuming an average of 260 construction days per year). Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 2 shows average daily construction emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub> exhaust, and PM<sub>2.5</sub> exhaust during construction of the project. As indicated in Table 2, predicted the construction period emissions would not exceed the BAAQMD significance thresholds.

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

**Table 2. Construction Period Emissions**

<b>Scenario</b>	<b>ROG</b>	<b>NOx</b>	<b>PM<sub>10</sub> Exhaust</b>	<b>PM<sub>2.5</sub> Exhaust</b>
Total construction emissions (tons)	0.36 tons	2.26 tons	0.12 tons	0.12 tons
Average daily emissions (pounds) <sup>1</sup>	2.8 lbs.	17.4 lbs.	0.9 lbs.	0.9 lbs.
<i>BAAQMD Thresholds (pounds per day)</i>	54 lbs.	54 lbs.	82 lbs.	54 lbs.
<b>Exceed Threshold?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
Notes: <sup>1</sup> Assumes 260 workdays.				

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

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

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

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

**Impact:** Expose sensitive receptors to substantial pollutant concentrations? *Less than significant with construction period mitigation.*

Project impacts related to increased community risk can occur either by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs or by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. The project would introduce new sensitive receptors. The BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs. Construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors.

### **Operational Community Risk Impacts**

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site. These sources include freeways or highways, busy surface streets and stationary sources identified by BAAQMD. Traffic on high volume roadways is a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadway. For local roadways, BAAQMD considers roadways with traffic volumes of over 10,000 vehicles per day to have a potentially significant impact on a proposed project. A review of the project area indicates that traffic on U.S. Highway 101 (Cabrillo Highway) is the only substantial source of mobile TAC emissions within 1,000 feet of project site. A review of BAAQMD's Google Earth map tool did not identify any stationary source with the potential to affect the project site.

BAAQMD provides a Highway Screening Analysis Google Earth Map tool to identify estimated risk and hazard impacts from highways throughout the Bay Area. Cumulative risk, hazard and PM<sub>2.5</sub> impacts at various distances from the highway are estimated for different segments of the highways. The tool uses the average annual daily traffic (AADT) count, fleet mix and other modeling parameters specific to that segment of the highway. Impacts from Link 788 (6ft elevation) California State Highway 1 (Highway 1), which is about 360 feet west of the project, were identified at the nearest project receptor, using this tool. The cancer at the nearest receptor was found to be 2.6 in a million. The PM<sub>2.5</sub> concentration was found to be less than 0.04 µg/m<sup>3</sup> and the hazard index (HI) was computed as less than 0.01. Therefore, highway 101 would have a *less than significant* impact on the project site receptors.

### **Project Construction Activity**

Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of respirable particulate matter (PM<sub>10</sub>) and PM<sub>2.5</sub>. Sources of



fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. *Mitigation Measure 1 would implement BAAQMD-required best management practices.*

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. As discussed under the impact above, 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 community risks for sensitive receptors such as nearby 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 community 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>3</sup> The closest sensitive receptors to the project site are the Linda Mar Rehabilitation Center to the south and the single family residences to the east (see Figure 1). Dispersion modeling was conducted to predict the off-site DPM concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

#### On-Site Construction TAC Emissions

Construction period emissions were computed using CalEEMod along with projected construction activity, as described above. The CalEEMod model provided total annual PM<sub>10</sub> exhaust emissions (assumed to be DPM) for the off-road construction equipment used for construction of the project and for the exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles) of 0.12 tons (240 pounds) over the construction period. A trip length of one-half mile was used to represent vehicle travel while at or near the construction site. For modeling purposes, it was assumed that these emissions from on-road vehicles would occur at the construction site. Fugitive dust PM<sub>2.5</sub> emissions were also computed and included in this analysis. The model predicts emissions of 0.03 tons (60 pounds) of fugitive PM<sub>2.5</sub> over the construction period.

#### Dispersion Modeling

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and PM<sub>2.5</sub> concentrations at sensitive receptors (residences and rehabilitation center) in the vicinity of the project construction area. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.<sup>4</sup> For each phase of construction the ISCST3 modeling utilized two area sources to represent the on-site construction emissions, one for exhaust emissions and one for fugitive dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters

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<sup>3</sup> DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

<sup>4</sup> Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0*. May.

(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 4 p.m., when the majority of construction activity would occur.

The modeling used a 5-year meteorological data set (2001-2005) from the Fort Funston meteorological station prepared for use with the ISCST3 model by the BAAQMD. Annual DPM and PM<sub>2.5</sub> concentrations from construction activities during the 2017-2018 period were calculated using the model. DPM and PM<sub>2.5</sub> concentrations were calculated at nearby sensitive receptor locations. Receptor height of 1.5 meters (4.9 feet) was used to represent the breathing height of residents in nearby single-family homes.

The locations of the receptors where the maximum modeled DPM and PM<sub>2.5</sub> concentration occurred have been identified in Figure 1. Using the maximum annual modeled DPM concentrations, the maximum increased cancer risks were calculated. *Attachment 2* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

### Cancer Risks

Results of this assessment indicate that the maximum excess residential cancer risks would be 33.0 in one million for an infant exposure and 0.7 in one million for an adult exposure. The maximum excess cancer risk at the Lina Mar rehabilitation center was computed as 9.8 for infant exposure and 0.2 in one million for adult exposure.<sup>5</sup> The maximum residential excess cancer risk for infant exposure would be greater than the BAAQMD significance threshold of 10 in one million. *Implementation of Mitigation Measures 1 and 2 would reduce this impact to a level of less than significant.*

### Predicted Annual PM<sub>2.5</sub> Concentration

The maximum-modeled annual PM<sub>2.5</sub> concentration, which is based on combined exhaust and fugitive dust emissions, was 0.4 µg/m<sup>3</sup>, and the location of the receptor has been identified in Figure 1. The maximum annual PM<sub>2.5</sub> concentration at the MEI residential receptor location would exceed the BAAQMD significance threshold of 0.3 µg/m<sup>3</sup>. *Implementation of Mitigation Measures 1 and 2 would reduce this impact to a level of less than significant.*

### Non-Cancer Hazards

The maximum modeled annual residential DPM concentration (i.e., from construction exhaust) was 0.237 µg/m<sup>3</sup>. The maximum computed HI based on this DPM concentration is 0.04, which is much lower than the BAAQMD significance criterion of a HI greater than 1.0.

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<sup>5</sup> Infant exposure is highly unlikely at the rehabilitation center.

## Cumulative Construction Risk Assessment

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site. These sources include freeways or highways, busy surface streets and stationary sources identified by BAAQMD. Traffic on high volume roadways is a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadway. For local roadways, BAAQMD considers roadways with traffic volumes of over 10,000 vehicles per day to have a potentially significant impact on a proposed project. A review of the project area indicates that traffic on Highway 1 (Cabrillo Highway) is the only substantial source of mobile TAC emissions within 1,000 feet of project site. A review of BAAQMD's Google Earth map tool did not identify any stationary source with the potential to affect the project site. Cumulative risk impacts from these sources upon the construction MEI are reported in Table 3.

BAAQMD provides a Highway Screening Analysis Google Earth Map tool to identify estimated risk and hazard impacts from highways throughout the Bay Area. Cumulative risk, hazard and PM<sub>2.5</sub> impacts at various distances from the highway are estimated for different segments of the highways. The tool uses the average annual daily traffic (AADT) count, fleet mix and other modeling parameters specific to that segment of the highway. Impacts from Link 788 (6ft elevation) Hwy. 1, which is about 760 feet west of the PM<sub>2.5</sub> MEI and 860 feet west of the cancer risk MEI, were identified using this tool.

**Table 3. Cumulative Construction Risk Assessment**

Source	Maximum Cancer Risk (per million)	Maximum Annual PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> )	Maximum Hazard Index
Unmitigated project construction	33.1	0.42	0.04
Highway 1 (Cabrillo Highway)	1.64	<0.03	<0.01
<b>Cumulative Total</b>	34.7	<0.45	<0.05
<b>BAAQMD Threshold – Cumulative Sources</b>	<b>&gt;100</b>	<b>&gt;0.8</b>	<b>&gt;10.0</b>
<b>Significant?</b>	<b>No</b>	<b>No</b>	<b>No</b>

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

The project shall develop a plan demonstrating that the off-road equipment used on-site to construct the project would achieve a fleet-wide average 69 percent reduction in PM<sub>2.5</sub> exhaust emissions or more. One feasible plan to achieve this reduction would include the following:

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

- All diesel-powered portable equipment (i.e., aerial lifts, air compressors, concrete and industrial saws, forklifts, and generators) operating on the site for more than two days shall meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent. Note that the construction contractor could use other measures to minimize construction period DPM emission to reduce the predicted cancer risk below the thresholds. The use of equipment that includes CARB-certified Level 3 Diesel Particulate Filters<sup>[1]</sup> or alternatively-fueled equipment (i.e., non-diesel) would meet this requirement. Other measures may be the use of added exhaust devices, or a combination of measures, provided that these measures are approved by the City and demonstrated to reduce community risk impacts to less than significant.

#### Effectiveness of Mitigation Measures 1 and 2

Implementation of Mitigation Measure 1 is considered to reduce exhaust emissions by 5 percent. Implementation of Mitigation Measures 2 would further reduce on-site diesel exhaust emissions. This would reduce the cancer risk proportionally, such that the mitigated risk would be less than 7.6 in one million. The PM<sub>2.5</sub> concentration would be reduced to less than 0.1 µg/m<sup>3</sup>. After implementation of these mitigation measures, the project would have a *less-than-significant* impact with respect to community risk caused by construction activities.

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<sup>[1]</sup> See <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

**Figure 1. Project Construction Site and Locations of Off-Site Sensitive Receptors and Maximum TAC and PM<sub>2.5</sub> Impacts**



## Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.<sup>6</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>7</sup> This HRA used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.<sup>8</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 of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 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. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

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

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<sup>6</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>7</sup> CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

<sup>8</sup> BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. January 2016.

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	9 < 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)*		361	1,090	631	572	261
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

\* 95<sup>th</sup> percentile breathing rates for 3<sup>rd</sup> trimester and infants and 80<sup>th</sup> percentile for children and adults

### Non-Cancer Hazards

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

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter (µg/m<sup>3</sup>).

### 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  $PM_{2.5}$  (project level and cumulative) are in terms of an increase in the annual average concentration. When considering  $PM_{2.5}$  impacts, the contribution from all sources of  $PM_{2.5}$  emissions should be included. For projects with potential impacts from nearby local roadways, the  $PM_{2.5}$  impacts should include those from vehicle exhaust emissions,  $PM_{2.5}$  generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.



**Attachment 2 Construction Schedule, CalEEMod Output Files and Health Risk Calculations**

Project Name: San Pedro Terrace											
Project Size		6 Dwelling Units		2.24 total project acres disturbed							
		18,000 s.f. residential		0 s.f. retail							
		0 s.f. office/commercial		0 s.f. other, specify:							
		0 s.f. other, specify:		Complete ALL Portions in Yellow							
		s.f. parking garage		0 spaces							
		0 s.f. parking lot		0 spaces							
Construction Hours		7 am to		4 pm							
Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Comments				
							Typical Equipment Type & Load Factors				
Demolition		Start Date:	6/1/2017		Total phase:	11	Overall Import/Export Volumes				
		End Date:	6/15/2017				OFFROAD Equipment Type		HP	Load Factor	
1	Concrete/Industrial Saws	81	0.73	8	10	7.2727273	Demolition Volume				
1	Excavators	162	0.38	4	10	3.6363636	Square footage of buildings to be demolished				
1	Rubber-Tired Dozers	255	0.4	8	11	8	(or total tons to be hauled)				
1	Tractors/Loaders/Backhoes	97	0.37	8	11	8	_2_ square feet or				
1	Generator	84	0.74	8	11	8	500 Hauling volume (tons)				
1	Tub Grinder	800	0.78	8	5	3.6363636	Cranes				
Site Preparation		Start Date:	6/16/2017		Total phase:	11	Any pavement demolished and hauled? 40 tons				
		End Date:	6/30/2017				Soil Hauling Volume				
1	Graders	174	0.41	8	10	7.2727273	Export volume = 400 cubic yards?				
1	Rubber Tired Dozers	255	0.4	8	10	7.2727273	Import volume = 2 cubic yards?				
1	Scrapers	361	0.48	8	12	8.7272727	Forklifts				
1	Tractors/Loaders/Backhoes	97	0.37	8	12	8.7272727	Generator Sets				
Grading / Excavation		Start Date:	7/1/2017		Total phase:	20	Soil Hauling Volume				
		End Date:	7/31/2017				Off-Highway Tractors				
1	Scrapers	361	0.48	8	10	4	Off-Highway Trucks				
1	Excavators	162	0.38	8	10	4	Export volume = 0 cubic yards?				
1	Graders	174	0.41	8	15	6	Import volume = 1250 cubic yards?				
1	Rubber Tired Dozers	255	0.4	8	4	1.6	Other Construction Equipment				
1	Tractors/Loaders/Backhoes	97	0.37	8	6	2.4	Other General Industrial Equipment				
1	Smooth Drum Roller Compactor	145	0.38	8	4	1.6	Other Material Handling Equipment				
Trenching		Start Date:	8/1/2017		Total phase:	23	Pavers				
		End Date:	8/31/2017				Paving Equipment				
	Tractor/Loader/Backhoe	97	0.37	8	23	8	Plate Compactors				
	Excavators	162	0.38	7	23	7	Pressure Washers				
	Roller	80	0.38	2	23	2	Pumps				
Building - Exterior		Start Date:	9/1/2017		Total phase:	85	Cement Trucks? 110 Total Round-Trips				
		End Date:	12/31/2017				Rollers				
0	Cranes	226	0.29	8	65	6.1176471	Rough Terrain Forklifts				
2	Forklifts	89	0.2	7	75	6.1764706	Rubber Tired Dozers				
3	Generator Sets	84	0.74	8	85	8	Rubber Tired Loaders				
2	Tractors/Loaders/Backhoes	97	0.37	6	40	2.8235294	Scrapers				
1	Welders	46	0.45	8	12	1.1294118	Signal Boards				
3	Cement Mixers	9	0.56	8	30	2.8235294	Skid Steer Loaders				
Building - Interior/Architectural Coating		Start Date:	1/1/2018		Total phase:	101	Liquid Propane (LPG)? (Y)				
		End Date:	6/1/2018				Or temporary line power? (Y/N) ___				
1	Air Compressors	78	0.48	8	101	6	otherwise, assume diesel generator				
	Aerial Lift	62	0.31	8	20	1.5841584	Tractors/Loaders/ Backhoes				
	Other Equipment?						Trenchers				
Paving		Start Date:	9/1/2017		Total phase:	19	Asphalt? 150 cubic yards or ___ round trips?				
		Start Date:	9/30/2017				Welders				
1	Cement and Mortar Mixers	9	0.56	8	12	5.0526316					
1	Pavers	125	0.42	8	15	6.3157895					
1	Paving Equipment	130	0.36	8	15	6.3157895					
2	Rollers	80	0.38	8	15	6.3157895					
1	Tractors/Loaders/Backhoes	97	0.37	8	10	4.2105263					
	Other Equipment?										

Equipment listed in this sheet is to provide an example of inputs  
 It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate  
 Modify horsepower or load factor, as appropriate



Trips and VMT - 110\*2=220 trips during building construction

Site clearing=20 round trips

Demolition - 40 tons of pavement

Grading - 400 cy of soil exported during site preparation

1250 cy of soil exported during graded

Construction Off-road Equipment Mitigation - Tier 2 and Tier 4 Portable

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	101.00
tblConstructionPhase	NumDays	220.00	85.00
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	19.00
tblConstructionPhase	NumDays	3.00	11.00

tblGrading	MaterialExported	0.00	1,250.00
tblGrading	MaterialExported	0.00	400.00
tblLandUse	BuildingSpaceSquareFeet	10,800.00	18,000.00
tblLandUse	LandUseSquareFeet	10,800.00	18,000.00
tblLandUse	LotAcreage	1.95	2.42
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	130.00	125.00
tblOffRoadEquipment	HorsePower	132.00	130.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	367.00	361.00
tblOffRoadEquipment	HorsePower	63.00	62.00
tblOffRoadEquipment	HorsePower	212.00	800.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	80.00	88.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	LoadFactor	0.43	0.78
tblOffRoadEquipment	LoadFactor	0.38	0.34
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	8.00	5.10
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	8.00	6.10
tblOffRoadEquipment	UsageHours	7.00	6.20

tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	1.60
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	6.00	2.80
tblOffRoadEquipment	UsageHours	7.00	2.40
tblOffRoadEquipment	UsageHours	8.00	4.20
tblOffRoadEquipment	UsageHours	7.00	8.70
tblOffRoadEquipment	UsageHours	8.00	1.10
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	20.00

## 2.0 Emissions Summary

### 2.1 Overall Construction Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2160	2.1548	1.4112	2.3900e-003	0.0750	0.1166	0.1916	0.0308	0.1108	0.1416	0.0000	216.0176	216.0176	0.0426	0.0000	217.0814
2018	0.1422	0.1084	0.1045	1.7000e-004	0.0000	7.8000e-003	7.8000e-003	0.0000	7.7800e-003	7.7800e-003	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Maximum</b>	<b>0.2160</b>	<b>2.1548</b>	<b>1.4112</b>	<b>2.3900e-003</b>	<b>0.0750</b>	<b>0.1166</b>	<b>0.1916</b>	<b>0.0308</b>	<b>0.1108</b>	<b>0.1416</b>	<b>0.0000</b>	<b>216.0176</b>	<b>216.0176</b>	<b>0.0426</b>	<b>0.0000</b>	<b>217.0814</b>

### 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					
2017	0.2160	2.1548	1.4112	2.3900e-003	0.0388	0.1166	0.1554	8.8600e-003	0.1108	0.1196	0.0000	216.0174	216.0174	0.0426	0.0000	217.0812
2018	0.1422	0.1084	0.1045	1.7000e-004	0.0000	7.8000e-003	7.8000e-003	0.0000	7.7800e-003	7.7800e-003	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Maximum</b>	<b>0.2160</b>	<b>2.1548</b>	<b>1.4112</b>	<b>2.3900e-003</b>	<b>0.0388</b>	<b>0.1166</b>	<b>0.1554</b>	<b>8.8600e-003</b>	<b>0.1108</b>	<b>0.1196</b>	<b>0.0000</b>	<b>216.0174</b>	<b>216.0174</b>	<b>0.0426</b>	<b>0.0000</b>	<b>217.0812</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>48.28</b>	<b>0.00</b>	<b>18.16</b>	<b>71.27</b>	<b>0.00</b>	<b>14.72</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>

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2017	8-31-2017	0.9787	0.9787
2	9-1-2017	11-30-2017	1.0809	1.0809
3	12-1-2017	2-28-2018	0.3963	0.3963
4	3-1-2018	5-31-2018	0.1453	0.1453
		<b>Highest</b>	<b>1.0809</b>	<b>1.0809</b>

### 3.0 Construction Detail

#### Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2017	6/15/2017	5	11	
2	Site Preparation	Site Preparation	6/16/2017	6/30/2017	5	11	
3	Grading	Grading	7/1/2017	7/28/2017	5	20	
4	Trenching	Trenching	8/1/2017	8/31/2017	5	23	

5	Building Construction	Building Construction	9/1/2017	12/28/2017	5	85
6	Paving	Paving	9/1/2017	9/27/2017	5	19
7	Architectural Coating	Architectural Coating	1/1/2018	5/21/2018	5	101

**Acres of Grading (Site Preparation Phase): 15.06**

**Acres of Grading (Grading Phase): 17.5**

**Acres of Paving: 0**

**Residential Indoor: 36,450; Residential Outdoor: 12,150; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0**

**OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	7.30	81	0.73
Demolition	Crawler Tractors	1	3.60	800	0.78
Demolition	Excavators	1	3.60	162	0.38
Demolition	Generator Sets	1	8.00	84	0.74
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	7.30	174	0.41
Site Preparation	Rubber Tired Dozers	1	8.70	255	0.40
Site Preparation	Scrapers	1	7.30	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	8.70	97	0.37
Grading	Excavators	1	4.00	158	0.38
Grading	Graders	1	6.00	174	0.41
Grading	Rollers	1	1.60	88	0.34
Grading	Rubber Tired Dozers	1	1.60	255	0.40
Grading	Scrapers	1	4.00	367	0.48
Grading	Tractors/Loaders/Backhoes	1	2.40	97	0.37
Trenching	Excavators	1	7.00	162	0.38
Trenching	Rollers	1	2.00	80	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37



Building Construction	Cement and Mortar Mixers	3	2.80	9	0.56
Building Construction	Cranes	1	6.10	226	0.29
Building Construction	Forklifts	2	6.20	89	0.20
Building Construction	Generator Sets	3	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	2.80	97	0.37
Building Construction	Welders	1	1.10	46	0.45
Paving	Cement and Mortar Mixers	1	5.10	9	0.56
Paving	Pavers	1	6.30	125	0.42
Paving	Paving Equipment	1	6.30	130	0.36
Paving	Rollers	2	6.30	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.20	97	0.37
Architectural Coating	Aerial Lifts	1	1.60	62	0.31
Architectural Coating	Air Compressors	1	6.00	78	0.48

### Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	4.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	10.00	0.00	50.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	156.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	12	2.00	1.00	260.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	20.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

**3.2 Demolition - 2017**

**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					4.3000e-004	0.0000	4.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.3504	0.1731	2.8000e-004		0.0144	0.0144		0.0135	0.0135	0.0000	25.5524	25.5524	6.5400e-003	0.0000	25.7159
<b>Total</b>	<b>0.0285</b>	<b>0.3504</b>	<b>0.1731</b>	<b>2.8000e-004</b>	<b>4.3000e-004</b>	<b>0.0144</b>	<b>0.0148</b>	<b>6.0000e-005</b>	<b>0.0135</b>	<b>0.0136</b>	<b>0.0000</b>	<b>25.5524</b>	<b>25.5524</b>	<b>6.5400e-003</b>	<b>0.0000</b>	<b>25.7159</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-005	8.0000e-004	2.7000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1742	0.1742	2.0000e-005	0.0000	0.1747
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	3.0000e-004	2.3000e-004	2.2600e-003	1.0000e-005	6.5000e-004	0.0000	6.5000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5943	0.5943	2.0000e-005	0.0000	0.5947
<b>Total</b>	<b>3.3000e-004</b>	<b>1.0300e-003</b>	<b>2.5300e-003</b>	<b>1.0000e-005</b>	<b>6.8000e-004</b>	<b>0.0000</b>	<b>6.9000e-004</b>	<b>1.8000e-004</b>	<b>0.0000</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>0.7684</b>	<b>0.7684</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.7693</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9000e-004	0.0000	1.9000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.3504	0.1731	2.8000e-004		0.0144	0.0144		0.0135	0.0135	0.0000	25.5524	25.5524	6.5400e-003	0.0000	25.7158
<b>Total</b>	<b>0.0285</b>	<b>0.3504</b>	<b>0.1731</b>	<b>2.8000e-004</b>	<b>1.9000e-004</b>	<b>0.0144</b>	<b>0.0146</b>	<b>1.0000e-005</b>	<b>0.0135</b>	<b>0.0135</b>	<b>0.0000</b>	<b>25.5524</b>	<b>25.5524</b>	<b>6.5400e-003</b>	<b>0.0000</b>	<b>25.7158</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-005	8.0000e-004	2.7000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1742	0.1742	2.0000e-005	0.0000	0.1747
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	3.0000e-004	2.3000e-004	2.2600e-003	1.0000e-005	6.5000e-004	0.0000	6.5000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5943	0.5943	2.0000e-005	0.0000	0.5947
<b>Total</b>	<b>3.3000e-004</b>	<b>1.0300e-003</b>	<b>2.5300e-003</b>	<b>1.0000e-005</b>	<b>6.8000e-004</b>	<b>0.0000</b>	<b>6.9000e-004</b>	<b>1.8000e-004</b>	<b>0.0000</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>0.7684</b>	<b>0.7684</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.7693</b>

### 3.3 Site Preparation - 2017

#### 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					0.0440	0.0000	0.0440	0.0207	0.0000	0.0207	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0203	0.2274	0.1492	1.8000e-004		0.0110	0.0110		0.0102	0.0102	0.0000	16.5034	16.5034	5.0600e-003	0.0000	16.6298
<b>Total</b>	<b>0.0203</b>	<b>0.2274</b>	<b>0.1492</b>	<b>1.8000e-004</b>	<b>0.0440</b>	<b>0.0110</b>	<b>0.0551</b>	<b>0.0207</b>	<b>0.0102</b>	<b>0.0308</b>	<b>0.0000</b>	<b>16.5034</b>	<b>16.5034</b>	<b>5.0600e-003</b>	<b>0.0000</b>	<b>16.6298</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	3.1000e-004	0.0100	3.4400e-003	2.0000e-005	4.2000e-004	6.0000e-005	4.8000e-004	1.1000e-004	6.0000e-005	1.7000e-004	0.0000	2.1768	2.1768	2.5000e-004	0.0000	2.1832
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	2.0000e-004	1.5000e-004	1.5100e-003	0.0000	4.3000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3962	0.3962	1.0000e-005	0.0000	0.3964
<b>Total</b>	<b>5.1000e-004</b>	<b>0.0102</b>	<b>4.9500e-003</b>	<b>2.0000e-005</b>	<b>8.5000e-004</b>	<b>6.0000e-005</b>	<b>9.2000e-004</b>	<b>2.3000e-004</b>	<b>6.0000e-005</b>	<b>2.9000e-004</b>	<b>0.0000</b>	<b>2.5730</b>	<b>2.5730</b>	<b>2.6000e-004</b>	<b>0.0000</b>	<b>2.5796</b>

**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					0.0198	0.0000	0.0198	4.6500e-003	0.0000	4.6500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0203	0.2274	0.1492	1.8000e-004		0.0110	0.0110		0.0102	0.0102	0.0000	16.5034	16.5034	5.0600e-003	0.0000	16.6298
<b>Total</b>	<b>0.0203</b>	<b>0.2274</b>	<b>0.1492</b>	<b>1.8000e-004</b>	<b>0.0198</b>	<b>0.0110</b>	<b>0.0309</b>	<b>4.6500e-003</b>	<b>0.0102</b>	<b>0.0148</b>	<b>0.0000</b>	<b>16.5034</b>	<b>16.5034</b>	<b>5.0600e-003</b>	<b>0.0000</b>	<b>16.6298</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	3.1000e-004	0.0100	3.4400e-003	2.0000e-005	4.2000e-004	6.0000e-005	4.8000e-004	1.1000e-004	6.0000e-005	1.7000e-004	0.0000	2.1768	2.1768	2.5000e-004	0.0000	2.1832
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	2.0000e-004	1.5000e-004	1.5100e-003	0.0000	4.3000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3962	0.3962	1.0000e-005	0.0000	0.3964
<b>Total</b>	<b>5.1000e-004</b>	<b>0.0102</b>	<b>4.9500e-003</b>	<b>2.0000e-005</b>	<b>8.5000e-004</b>	<b>6.0000e-005</b>	<b>9.2000e-004</b>	<b>2.3000e-004</b>	<b>6.0000e-005</b>	<b>2.9000e-004</b>	<b>0.0000</b>	<b>2.5730</b>	<b>2.5730</b>	<b>2.6000e-004</b>	<b>0.0000</b>	<b>2.5796</b>

**3.4 Grading - 2017**

**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					0.0214	0.0000	0.0214	7.6300e-003	0.0000	7.6300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2161	0.1358	1.8000e-004		0.0107	0.0107		9.8300e-003	9.8300e-003	0.0000	16.7535	16.7535	5.1300e-003	0.0000	16.8818
<b>Total</b>	<b>0.0195</b>	<b>0.2161</b>	<b>0.1358</b>	<b>1.8000e-004</b>	<b>0.0214</b>	<b>0.0107</b>	<b>0.0321</b>	<b>7.6300e-003</b>	<b>9.8300e-003</b>	<b>0.0175</b>	<b>0.0000</b>	<b>16.7535</b>	<b>16.7535</b>	<b>5.1300e-003</b>	<b>0.0000</b>	<b>16.8818</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
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Category	tons/yr										MT/yr					
	Hauling	9.8000e-004	0.0313	0.0107	7.0000e-005	1.3000e-003	1.8000e-004	1.4900e-003	3.6000e-004	1.8000e-004	5.3000e-004	0.0000	6.7917	6.7917	7.9000e-004	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-004	4.1000e-004	4.1100e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0805	1.0805	3.0000e-005	0.0000	1.0812
<b>Total</b>	<b>1.5300e-003</b>	<b>0.0317</b>	<b>0.0148</b>	<b>8.0000e-005</b>	<b>2.4800e-003</b>	<b>1.9000e-004</b>	<b>2.6800e-003</b>	<b>6.7000e-004</b>	<b>1.9000e-004</b>	<b>8.5000e-004</b>	<b>0.0000</b>	<b>7.8722</b>	<b>7.8722</b>	<b>8.2000e-004</b>	<b>0.0000</b>	<b>7.8927</b>

### 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					9.6300e-003	0.0000	9.6300e-003	1.7200e-003	0.0000	1.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2161	0.1358	1.8000e-004		0.0107	0.0107		9.8300e-003	9.8300e-003	0.0000	16.7534	16.7534	5.1300e-003	0.0000	16.8818
<b>Total</b>	<b>0.0195</b>	<b>0.2161</b>	<b>0.1358</b>	<b>1.8000e-004</b>	<b>9.6300e-003</b>	<b>0.0107</b>	<b>0.0203</b>	<b>1.7200e-003</b>	<b>9.8300e-003</b>	<b>0.0116</b>	<b>0.0000</b>	<b>16.7534</b>	<b>16.7534</b>	<b>5.1300e-003</b>	<b>0.0000</b>	<b>16.8818</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	9.8000e-004	0.0313	0.0107	7.0000e-005	1.3000e-003	1.8000e-004	1.4900e-003	3.6000e-004	1.8000e-004	5.3000e-004	0.0000	6.7917	6.7917	7.9000e-004	0.0000	6.8115
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-004	4.1000e-004	4.1100e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0805	1.0805	3.0000e-005	0.0000	1.0812

<b>Total</b>	<b>1.5300e-003</b>	<b>0.0317</b>	<b>0.0148</b>	<b>8.0000e-005</b>	<b>2.4800e-003</b>	<b>1.9000e-004</b>	<b>2.6800e-003</b>	<b>6.7000e-004</b>	<b>1.9000e-004</b>	<b>8.5000e-004</b>	<b>0.0000</b>	<b>7.8722</b>	<b>7.8722</b>	<b>8.2000e-004</b>	<b>0.0000</b>	<b>7.8927</b>
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### 3.5 Trenching - 2017

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1800e-003	0.0838	0.0677	1.0000e-004		5.2300e-003	5.2300e-003		4.8100e-003	4.8100e-003	0.0000	8.9607	8.9607	2.7500e-003	0.0000	9.0293
<b>Total</b>	<b>8.1800e-003</b>	<b>0.0838</b>	<b>0.0677</b>	<b>1.0000e-004</b>		<b>5.2300e-003</b>	<b>5.2300e-003</b>		<b>4.8100e-003</b>	<b>4.8100e-003</b>	<b>0.0000</b>	<b>8.9607</b>	<b>8.9607</b>	<b>2.7500e-003</b>	<b>0.0000</b>	<b>9.0293</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	3.4000e-004	2.5000e-004	2.5200e-003	1.0000e-005	7.2000e-004	0.0000	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6627	0.6627	2.0000e-005	0.0000	0.6631
<b>Total</b>	<b>3.4000e-004</b>	<b>2.5000e-004</b>	<b>2.5200e-003</b>	<b>1.0000e-005</b>	<b>7.2000e-004</b>	<b>0.0000</b>	<b>7.3000e-004</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>2.0000e-004</b>	<b>0.0000</b>	<b>0.6627</b>	<b>0.6627</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.6631</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1800e-003	0.0838	0.0677	1.0000e-004		5.2300e-003	5.2300e-003		4.8100e-003	4.8100e-003	0.0000	8.9607	8.9607	2.7500e-003	0.0000	9.0293
<b>Total</b>	<b>8.1800e-003</b>	<b>0.0838</b>	<b>0.0677</b>	<b>1.0000e-004</b>		<b>5.2300e-003</b>	<b>5.2300e-003</b>		<b>4.8100e-003</b>	<b>4.8100e-003</b>	<b>0.0000</b>	<b>8.9607</b>	<b>8.9607</b>	<b>2.7500e-003</b>	<b>0.0000</b>	<b>9.0293</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	3.4000e-004	2.5000e-004	2.5200e-003	1.0000e-005	7.2000e-004	0.0000	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6627	0.6627	2.0000e-005	0.0000	0.6631
<b>Total</b>	<b>3.4000e-004</b>	<b>2.5000e-004</b>	<b>2.5200e-003</b>	<b>1.0000e-005</b>	<b>7.2000e-004</b>	<b>0.0000</b>	<b>7.3000e-004</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>2.0000e-004</b>	<b>0.0000</b>	<b>0.6627</b>	<b>0.6627</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.6631</b>

**3.6 Building Construction - 2017**

**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	0.1226	1.0560	0.7489	1.2600e-003		0.0676	0.0676		0.0653	0.0653	0.0000	110.1063	110.1063	0.0170	0.0000	110.5307
<b>Total</b>	<b>0.1226</b>	<b>1.0560</b>	<b>0.7489</b>	<b>1.2600e-003</b>		<b>0.0676</b>	<b>0.0676</b>		<b>0.0653</b>	<b>0.0653</b>	<b>0.0000</b>	<b>110.1063</b>	<b>110.1063</b>	<b>0.0170</b>	<b>0.0000</b>	<b>110.5307</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	1.6400e-003	0.0522	0.0179	1.1000e-004	2.1700e-003	3.1000e-004	2.4800e-003	6.0000e-004	2.9000e-004	8.9000e-004	0.0000	11.3195	11.3195	1.3200e-003	0.0000	11.3524
Vendor	2.6000e-004	6.2100e-003	2.3700e-003	1.0000e-005	2.8000e-004	6.0000e-005	3.3000e-004	8.0000e-005	5.0000e-005	1.3000e-004	0.0000	1.1579	1.1579	1.0000e-004	0.0000	1.1605
Worker	3.1000e-004	2.3000e-004	2.3300e-003	1.0000e-005	6.7000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.6123	0.6123	2.0000e-005	0.0000	0.6127
<b>Total</b>	<b>2.2100e-003</b>	<b>0.0586</b>	<b>0.0226</b>	<b>1.3000e-004</b>	<b>3.1200e-003</b>	<b>3.7000e-004</b>	<b>3.4800e-003</b>	<b>8.6000e-004</b>	<b>3.4000e-004</b>	<b>1.2000e-003</b>	<b>0.0000</b>	<b>13.0897</b>	<b>13.0897</b>	<b>1.4400e-003</b>	<b>0.0000</b>	<b>13.1257</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1226	1.0560	0.7489	1.2600e-003		0.0676	0.0676		0.0653	0.0653	0.0000	110.1062	110.1062	0.0170	0.0000	110.5306
<b>Total</b>	<b>0.1226</b>	<b>1.0560</b>	<b>0.7489</b>	<b>1.2600e-003</b>		<b>0.0676</b>	<b>0.0676</b>		<b>0.0653</b>	<b>0.0653</b>	<b>0.0000</b>	<b>110.1062</b>	<b>110.1062</b>	<b>0.0170</b>	<b>0.0000</b>	<b>110.5306</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	1.6400e-003	0.0522	0.0179	1.1000e-004	2.1700e-003	3.1000e-004	2.4800e-003	6.0000e-004	2.9000e-004	8.9000e-004	0.0000	11.3195	11.3195	1.3200e-003	0.0000	11.3524
Vendor	2.6000e-004	6.2100e-003	2.3700e-003	1.0000e-005	2.8000e-004	6.0000e-005	3.3000e-004	8.0000e-005	5.0000e-005	1.3000e-004	0.0000	1.1579	1.1579	1.0000e-004	0.0000	1.1605
Worker	3.1000e-004	2.3000e-004	2.3300e-003	1.0000e-005	6.7000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.6123	0.6123	2.0000e-005	0.0000	0.6127
<b>Total</b>	<b>2.2100e-003</b>	<b>0.0586</b>	<b>0.0226</b>	<b>1.3000e-004</b>	<b>3.1200e-003</b>	<b>3.7000e-004</b>	<b>3.4800e-003</b>	<b>8.6000e-004</b>	<b>3.4000e-004</b>	<b>1.2000e-003</b>	<b>0.0000</b>	<b>13.0897</b>	<b>13.0897</b>	<b>1.4400e-003</b>	<b>0.0000</b>	<b>13.1257</b>

### 3.7 Paving - 2017

#### 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	0.0114	0.1150	0.0838	1.2000e-004		7.0600e-003	7.0600e-003		6.5000e-003	6.5000e-003	0.0000	11.2782	11.2782	3.4000e-003	0.0000	11.3632
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>0.0114</b>	<b>0.1150</b>	<b>0.0838</b>	<b>1.2000e-004</b>		<b>7.0600e-003</b>	<b>7.0600e-003</b>		<b>6.5000e-003</b>	<b>6.5000e-003</b>	<b>0.0000</b>	<b>11.2782</b>	<b>11.2782</b>	<b>3.4000e-003</b>	<b>0.0000</b>	<b>11.3632</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
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Category	tons/yr										MT/yr					
Hauling	1.3000e-004	4.0100e-003	1.3700e-003	1.0000e-005	1.7000e-004	2.0000e-005	1.9000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.8707	0.8707	1.0000e-004	0.0000	0.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	3.9100e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	1.0265	1.0265	3.0000e-005	0.0000	1.0271
<b>Total</b>	<b>6.5000e-004</b>	<b>4.4000e-003</b>	<b>5.2800e-003</b>	<b>2.0000e-005</b>	<b>1.2900e-003</b>	<b>3.0000e-005</b>	<b>1.3200e-003</b>	<b>3.5000e-004</b>	<b>3.0000e-005</b>	<b>3.8000e-004</b>	<b>0.0000</b>	<b>1.8972</b>	<b>1.8972</b>	<b>1.3000e-004</b>	<b>0.0000</b>	<b>1.9004</b>

### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0114	0.1150	0.0838	1.2000e-004		7.0600e-003	7.0600e-003		6.5000e-003	6.5000e-003	0.0000	11.2782	11.2782	3.4000e-003	0.0000	11.3632
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>0.0114</b>	<b>0.1150</b>	<b>0.0838</b>	<b>1.2000e-004</b>		<b>7.0600e-003</b>	<b>7.0600e-003</b>		<b>6.5000e-003</b>	<b>6.5000e-003</b>	<b>0.0000</b>	<b>11.2782</b>	<b>11.2782</b>	<b>3.4000e-003</b>	<b>0.0000</b>	<b>11.3632</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	1.3000e-004	4.0100e-003	1.3700e-003	1.0000e-005	1.7000e-004	2.0000e-005	1.9000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.8707	0.8707	1.0000e-004	0.0000	0.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	3.9100e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	1.0265	1.0265	3.0000e-005	0.0000	1.0271

Total	6.5000e-004	4.4000e-003	5.2800e-003	2.0000e-005	1.2900e-003	3.0000e-005	1.3200e-003	3.5000e-004	3.0000e-005	3.8000e-004	0.0000	1.8972	1.8972	1.3000e-004	0.0000	1.9004
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### 3.8 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	0.1267					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0155	0.1084	0.1045	1.7000e-004		7.8000e-003	7.8000e-003		7.7800e-003	7.7800e-003	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Total</b>	<b>0.1422</b>	<b>0.1084</b>	<b>0.1045</b>	<b>1.7000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.7800e-003</b>	<b>7.7800e-003</b>	<b>0.0000</b>	<b>14.4173</b>	<b>14.4173</b>	<b>1.7000e-003</b>	<b>0.0000</b>	<b>14.4598</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	0.0000	0.0000	0.0000	0.0000	0.0000	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>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

#### Mitigated Construction On-Site



San Pedro Terrace, TAC - San Mateo County, Annual

**San Pedro Terrace, TAC**  
**San Mateo County, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	6.00	Dwelling Unit	2.42	18,000.00	17

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	70
<b>Climate Zone</b>	5			<b>Operational Year</b>	2019
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MW hr)</b>	429.6	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

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

Project Characteristics - 2018 projected CO2 intensity factor

Land Use - From the project client filled construction spreadsheet

Construction Phase - From Client Filled construction information spreadsheet

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Trips and VMT - 110\*2=220 trips during building construction

Site clearing=20 truck roundtrips

Demolition - 40 tons of pavement

Grading - 400 cy of soil exported during site preparation

1250 cy of soil exported during graded

Construction Off-road Equipment Mitigation - Tier 2 and Tier 4 Portable

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	101.00
tblConstructionPhase	NumDays	220.00	85.00
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	19.00
tblConstructionPhase	NumDays	3.00	11.00
tblGrading	MaterialExported	0.00	1,250.00
tblGrading	MaterialExported	0.00	400.00
tblLandUse	BuildingSpaceSquareFeet	10,800.00	18,000.00
tblLandUse	LandUseSquareFeet	10,800.00	18,000.00
tblLandUse	LotAcreage	1.95	2.42
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	130.00	125.00
tblOffRoadEquipment	HorsePower	132.00	130.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	367.00	361.00



tblOffRoadEquipment	HorsePower	63.00	62.00
tblOffRoadEquipment	HorsePower	212.00	800.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	80.00	88.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	LoadFactor	0.43	0.78
tblOffRoadEquipment	LoadFactor	0.38	0.34
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	8.00	5.10
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	8.00	6.10
tblOffRoadEquipment	UsageHours	7.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	6.30
tblOffRoadEquipment	UsageHours	8.00	1.60
tblOffRoadEquipment	UsageHours	8.00	7.30
tblOffRoadEquipment	UsageHours	6.00	2.80
tblOffRoadEquipment	UsageHours	7.00	2.40
tblOffRoadEquipment	UsageHours	8.00	4.20
tblOffRoadEquipment	UsageHours	7.00	8.70
tblOffRoadEquipment	UsageHours	8.00	1.10
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6

tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50

## 2.0 Emissions Summary

### 2.1 Overall Construction

#### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2119	2.0771	1.3717	2.1500e-003	0.0662	0.1160	0.1822	0.0285	0.1102	0.1386	0.0000	191.8406	191.8406	0.0403	0.0000	192.8468
2018	0.1422	0.1084	0.1045	1.7000e-004	0.0000	7.8000e-003	7.8000e-003	0.0000	7.7800e-003	7.7800e-003	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Maximum</b>	<b>0.2119</b>	<b>2.0771</b>	<b>1.3717</b>	<b>2.1500e-003</b>	<b>0.0662</b>	<b>0.1160</b>	<b>0.1822</b>	<b>0.0285</b>	<b>0.1102</b>	<b>0.1386</b>	<b>0.0000</b>	<b>191.8406</b>	<b>191.8406</b>	<b>0.0403</b>	<b>0.0000</b>	<b>192.8468</b>

### 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					
2017	0.0557	1.3143	1.3272	2.1500e-003	0.0300	0.0281	0.0581	6.4800e-003	0.0281	0.0346	0.0000	191.8404	191.8404	0.0403	0.0000	192.8465
2018	0.1299	0.0629	0.1052	1.7000e-004	0.0000	5.8000e-004	5.8000e-004	0.0000	5.8000e-004	5.8000e-004	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Maximum</b>	<b>0.1299</b>	<b>1.3143</b>	<b>1.3272</b>	<b>2.1500e-003</b>	<b>0.0300</b>	<b>0.0281</b>	<b>0.0581</b>	<b>6.4800e-003</b>	<b>0.0281</b>	<b>0.0346</b>	<b>0.0000</b>	<b>191.8404</b>	<b>191.8404</b>	<b>0.0403</b>	<b>0.0000</b>	<b>192.8465</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>47.58</b>	<b>36.98</b>	<b>2.97</b>	<b>0.00</b>	<b>54.70</b>	<b>76.83</b>	<b>69.12</b>	<b>77.23</b>	<b>75.68</b>	<b>75.98</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>

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2017	8-31-2017	0.9461	0.6013
2	9-1-2017	11-30-2017	1.0437	0.6068
3	12-1-2017	2-28-2018	0.3858	0.2315
4	3-1-2018	5-31-2018	0.1453	0.1118
		<b>Highest</b>	<b>1.0437</b>	<b>0.6068</b>

### 3.0 Construction Detail

#### Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2017	6/15/2017	5	11	
2	Site Preparation	Site Preparation	6/16/2017	6/30/2017	5	11	
3	Grading	Grading	7/1/2017	7/28/2017	5	20	
4	Trenching	Trenching	8/1/2017	8/31/2017	5	23	
5	Building Construction	Building Construction	9/1/2017	12/28/2017	5	85	
6	Paving	Paving	9/1/2017	9/27/2017	5	19	
7	Architectural Coating	Architectural Coating	1/1/2018	5/21/2018	5	101	

Acres of Grading (Site Preparation Phase): 15.06

Acres of Grading (Grading Phase): 17.5

Acres of Paving: 0

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

#### OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	7.30	81	0.73
Demolition	Crawler Tractors	1	3.60	800	0.78
Demolition	Excavators	1	3.60	162	0.38
Demolition	Generator Sets	1	8.00	84	0.74
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	7.30	174	0.41
Site Preparation	Rubber Tired Dozers	1	8.70	255	0.40
Site Preparation	Scrapers	1	7.30	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	8.70	97	0.37
Grading	Excavators	1	4.00	158	0.38

Grading	Graders	1	6.00	174	0.41
Grading	Rollers	1	1.60	88	0.34
Grading	Rubber Tired Dozers	1	1.60	255	0.40
Grading	Scrapers	1	4.00	367	0.48
Grading	Tractors/Loaders/Backhoes	1	2.40	97	0.37
Trenching	Excavators	1	7.00	162	0.38
Trenching	Rollers	1	2.00	80	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cement and Mortar Mixers	3	2.80	9	0.56
Building Construction	Cranes	1	6.10	226	0.29
Building Construction	Forklifts	2	6.20	89	0.20
Building Construction	Generator Sets	3	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	2.80	97	0.37
Building Construction	Welders	1	1.10	46	0.45
Paving	Cement and Mortar Mixers	1	5.10	9	0.56
Paving	Pavers	1	6.30	125	0.42
Paving	Paving Equipment	1	6.30	130	0.36
Paving	Rollers	2	6.30	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.20	97	0.37
Architectural Coating	Aerial Lifts	1	1.60	62	0.31
Architectural Coating	Air Compressors	1	6.00	78	0.48

### Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	4.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	10.00	0.00	50.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	156.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Trenching	3	8.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Building Construction	12	2.00	1.00	260.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

Paving	6	15.00	0.00	20.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	0.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

### 3.2 Demolition - 2017

#### 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					4.3000e-004	0.0000	4.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.3504	0.1731	2.8000e-004		0.0144	0.0144		0.0135	0.0135	0.0000	25.5524	25.5524	6.5400e-003	0.0000	25.7159
<b>Total</b>	<b>0.0285</b>	<b>0.3504</b>	<b>0.1731</b>	<b>2.8000e-004</b>	<b>4.3000e-004</b>	<b>0.0144</b>	<b>0.0148</b>	<b>6.0000e-005</b>	<b>0.0135</b>	<b>0.0136</b>	<b>0.0000</b>	<b>25.5524</b>	<b>25.5524</b>	<b>6.5400e-003</b>	<b>0.0000</b>	<b>25.7159</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	2.1000e-004	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0174	0.0174	0.0000	0.0000	0.0175

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	9.0000e-005	4.0000e-005	5.6000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0443	0.0443	0.0000	0.0000	0.0444
<b>Total</b>	<b>1.0000e-004</b>	<b>2.5000e-004</b>	<b>6.2000e-004</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0617</b>	<b>0.0617</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0619</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9000e-004	0.0000	1.9000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.0100e-003	0.1961	0.1610	2.8000e-004		4.3700e-003	4.3700e-003		4.3700e-003	4.3700e-003	0.0000	25.5524	25.5524	6.5400e-003	0.0000	25.7158
<b>Total</b>	<b>7.0100e-003</b>	<b>0.1961</b>	<b>0.1610</b>	<b>2.8000e-004</b>	<b>1.9000e-004</b>	<b>4.3700e-003</b>	<b>4.5600e-003</b>	<b>1.0000e-005</b>	<b>4.3700e-003</b>	<b>4.3800e-003</b>	<b>0.0000</b>	<b>25.5524</b>	<b>25.5524</b>	<b>6.5400e-003</b>	<b>0.0000</b>	<b>25.7158</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	2.1000e-004	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0174	0.0174	0.0000	0.0000	0.0175
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	9.0000e-005	4.0000e-005	5.6000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0443	0.0443	0.0000	0.0000	0.0444
<b>Total</b>	<b>1.0000e-004</b>	<b>2.5000e-004</b>	<b>6.2000e-004</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.0617</b>	<b>0.0617</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0619</b>

### 3.3 Site Preparation - 2017

#### 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					0.0440	0.0000	0.0440	0.0207	0.0000	0.0207	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0203	0.2274	0.1492	1.8000e-004		0.0110	0.0110		0.0102	0.0102	0.0000	16.5034	16.5034	5.0600e-003	0.0000	16.6298
<b>Total</b>	<b>0.0203</b>	<b>0.2274</b>	<b>0.1492</b>	<b>1.8000e-004</b>	<b>0.0440</b>	<b>0.0110</b>	<b>0.0551</b>	<b>0.0207</b>	<b>0.0102</b>	<b>0.0308</b>	<b>0.0000</b>	<b>16.5034</b>	<b>16.5034</b>	<b>5.0600e-003</b>	<b>0.0000</b>	<b>16.6298</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	7.0000e-005	2.5800e-003	8.1000e-004	0.0000	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.2179	0.2179	3.0000e-005	0.0000	0.2188
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	3.0000e-005	3.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0295	0.0295	0.0000	0.0000	0.0296
<b>Total</b>	<b>1.3000e-004</b>	<b>2.6100e-003</b>	<b>1.1800e-003</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>1.0000e-005</b>	<b>4.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.2474</b>	<b>0.2474</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.2483</b>

#### 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
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Category	tons/yr										MT/yr					
Fugitive Dust					0.0198	0.0000	0.0198	4.6500e-003	0.0000	4.6500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2000e-003	0.1471	0.1052	1.8000e-004		3.8300e-003	3.8300e-003		3.8300e-003	3.8300e-003	0.0000	16.5034	16.5034	5.0600e-003	0.0000	16.6298
<b>Total</b>	<b>5.2000e-003</b>	<b>0.1471</b>	<b>0.1052</b>	<b>1.8000e-004</b>	<b>0.0198</b>	<b>3.8300e-003</b>	<b>0.0236</b>	<b>4.6500e-003</b>	<b>3.8300e-003</b>	<b>8.4800e-003</b>	<b>0.0000</b>	<b>16.5034</b>	<b>16.5034</b>	<b>5.0600e-003</b>	<b>0.0000</b>	<b>16.6298</b>

**Mitigated Construction Off-Site**

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	7.0000e-005	2.5800e-003	8.1000e-004	0.0000	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.2179	0.2179	3.0000e-005	0.0000	0.2188
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	3.0000e-005	3.7000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0295	0.0295	0.0000	0.0000	0.0296
<b>Total</b>	<b>1.3000e-004</b>	<b>2.6100e-003</b>	<b>1.1800e-003</b>	<b>0.0000</b>	<b>3.0000e-005</b>	<b>1.0000e-005</b>	<b>4.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.2474</b>	<b>0.2474</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.2483</b>

**3.4 Grading - 2017**

**Unmitigated Construction On-Site**

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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					0.0214	0.0000	0.0214	7.6300e-003	0.0000	7.6300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2161	0.1358	1.8000e-004		0.0107	0.0107		9.8300e-003	9.8300e-003	0.0000	16.7535	16.7535	5.1300e-003	0.0000	16.8818

<b>Total</b>	<b>0.0195</b>	<b>0.2161</b>	<b>0.1358</b>	<b>1.8000e-004</b>	<b>0.0214</b>	<b>0.0107</b>	<b>0.0321</b>	<b>7.6300e-003</b>	<b>9.8300e-003</b>	<b>0.0175</b>	<b>0.0000</b>	<b>16.7535</b>	<b>16.7535</b>	<b>5.1300e-003</b>	<b>0.0000</b>	<b>16.8818</b>
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**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	8.0500e-003	2.5200e-003	1.0000e-005	3.0000e-005	2.0000e-005	5.0000e-005	1.0000e-005	2.0000e-005	2.0000e-005	0.0000	0.6798	0.6798	1.1000e-004	0.0000	0.6825
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	1.7000e-004	8.0000e-005	1.0200e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0805	0.0805	1.0000e-005	0.0000	0.0806
<b>Total</b>	<b>3.9000e-004</b>	<b>8.1300e-003</b>	<b>3.5400e-003</b>	<b>1.0000e-005</b>	<b>9.0000e-005</b>	<b>2.0000e-005</b>	<b>1.1000e-004</b>	<b>3.0000e-005</b>	<b>2.0000e-005</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.7603</b>	<b>0.7603</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.7632</b>

**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					9.6300e-003	0.0000	9.6300e-003	1.7200e-003	0.0000	1.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7700e-003	0.1493	0.1152	1.8000e-004		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.0000	16.7534	16.7534	5.1300e-003	0.0000	16.8818
<b>Total</b>	<b>5.7700e-003</b>	<b>0.1493</b>	<b>0.1152</b>	<b>1.8000e-004</b>	<b>9.6300e-003</b>	<b>4.1400e-003</b>	<b>0.0138</b>	<b>1.7200e-003</b>	<b>4.1400e-003</b>	<b>5.8600e-003</b>	<b>0.0000</b>	<b>16.7534</b>	<b>16.7534</b>	<b>5.1300e-003</b>	<b>0.0000</b>	<b>16.8818</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	2.2000e-004	8.0500e-003	2.5200e-003	1.0000e-005	3.0000e-005	2.0000e-005	5.0000e-005	1.0000e-005	2.0000e-005	2.0000e-005	0.0000	0.6798	0.6798	1.1000e-004	0.0000	0.6825
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	1.7000e-004	8.0000e-005	1.0200e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0805	0.0805	1.0000e-005	0.0000	0.0806
<b>Total</b>	<b>3.9000e-004</b>	<b>8.1300e-003</b>	<b>3.5400e-003</b>	<b>1.0000e-005</b>	<b>9.0000e-005</b>	<b>2.0000e-005</b>	<b>1.1000e-004</b>	<b>3.0000e-005</b>	<b>2.0000e-005</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.7603</b>	<b>0.7603</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.7632</b>

### 3.5 Trenching - 2017

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1800e-003	0.0838	0.0677	1.0000e-004		5.2300e-003	5.2300e-003		4.8100e-003	4.8100e-003	0.0000	8.9607	8.9607	2.7500e-003	0.0000	9.0293
<b>Total</b>	<b>8.1800e-003</b>	<b>0.0838</b>	<b>0.0677</b>	<b>1.0000e-004</b>		<b>5.2300e-003</b>	<b>5.2300e-003</b>		<b>4.8100e-003</b>	<b>4.8100e-003</b>	<b>0.0000</b>	<b>8.9607</b>	<b>8.9607</b>	<b>2.7500e-003</b>	<b>0.0000</b>	<b>9.0293</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	1.0000e-004	5.0000e-005	6.3000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0495
<b>Total</b>	<b>1.0000e-004</b>	<b>5.0000e-005</b>	<b>6.3000e-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>0.0494</b>	<b>0.0494</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0495</b>

**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	4.1000e-003	0.0875	0.0731	1.0000e-004		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003	0.0000	8.9607	8.9607	2.7500e-003	0.0000	9.0293
<b>Total</b>	<b>4.1000e-003</b>	<b>0.0875</b>	<b>0.0731</b>	<b>1.0000e-004</b>		<b>3.0900e-003</b>	<b>3.0900e-003</b>		<b>3.0900e-003</b>	<b>3.0900e-003</b>	<b>0.0000</b>	<b>8.9607</b>	<b>8.9607</b>	<b>2.7500e-003</b>	<b>0.0000</b>	<b>9.0293</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	1.0000e-004	5.0000e-005	6.3000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0495
<b>Total</b>	<b>1.0000e-004</b>	<b>5.0000e-005</b>	<b>6.3000e-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>0.0494</b>	<b>0.0494</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0495</b>

### 3.6 Building Construction - 2017

#### 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	0.1226	1.0560	0.7489	1.2600e-003		0.0676	0.0676		0.0653	0.0653	0.0000	110.1063	110.1063	0.0170	0.0000	110.5307
<b>Total</b>	<b>0.1226</b>	<b>1.0560</b>	<b>0.7489</b>	<b>1.2600e-003</b>		<b>0.0676</b>	<b>0.0676</b>		<b>0.0653</b>	<b>0.0653</b>	<b>0.0000</b>	<b>110.1063</b>	<b>110.1063</b>	<b>0.0170</b>	<b>0.0000</b>	<b>110.5307</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	3.7000e-004	0.0134	4.2000e-003	1.0000e-005	6.0000e-005	3.0000e-005	8.0000e-005	2.0000e-005	3.0000e-005	4.0000e-005	0.0000	1.1330	1.1330	1.8000e-004	0.0000	1.1375
Vendor	1.0000e-004	2.8600e-003	1.2200e-003	0.0000	2.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.2251	0.2251	3.0000e-005	0.0000	0.2260
Worker	9.0000e-005	4.0000e-005	5.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0456	0.0456	0.0000	0.0000	0.0457
<b>Total</b>	<b>5.6000e-004</b>	<b>0.0163</b>	<b>6.0000e-003</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>4.0000e-005</b>	<b>1.4000e-004</b>	<b>4.0000e-005</b>	<b>4.0000e-005</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.4038</b>	<b>1.4038</b>	<b>2.1000e-004</b>	<b>0.0000</b>	<b>1.4092</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0271	0.5982	0.7695	1.2600e-003		8.7900e-003	8.7900e-003		8.7900e-003	8.7900e-003	0.0000	110.1062	110.1062	0.0170	0.0000	110.5306
<b>Total</b>	<b>0.0271</b>	<b>0.5982</b>	<b>0.7695</b>	<b>1.2600e-003</b>		<b>8.7900e-003</b>	<b>8.7900e-003</b>		<b>8.7900e-003</b>	<b>8.7900e-003</b>	<b>0.0000</b>	<b>110.1062</b>	<b>110.1062</b>	<b>0.0170</b>	<b>0.0000</b>	<b>110.5306</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	3.7000e-004	0.0134	4.2000e-003	1.0000e-005	6.0000e-005	3.0000e-005	8.0000e-005	2.0000e-005	3.0000e-005	4.0000e-005	0.0000	1.1330	1.1330	1.8000e-004	0.0000	1.1375
Vendor	1.0000e-004	2.8600e-003	1.2200e-003	0.0000	2.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.2251	0.2251	3.0000e-005	0.0000	0.2260
Worker	9.0000e-005	4.0000e-005	5.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0456	0.0456	0.0000	0.0000	0.0457
<b>Total</b>	<b>5.6000e-004</b>	<b>0.0163</b>	<b>6.0000e-003</b>	<b>1.0000e-005</b>	<b>1.1000e-004</b>	<b>4.0000e-005</b>	<b>1.4000e-004</b>	<b>4.0000e-005</b>	<b>4.0000e-005</b>	<b>6.0000e-005</b>	<b>0.0000</b>	<b>1.4038</b>	<b>1.4038</b>	<b>2.1000e-004</b>	<b>0.0000</b>	<b>1.4092</b>

### 3.7 Paving - 2017

#### 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	0.0114	0.1150	0.0838	1.2000e-004		7.0600e-003	7.0600e-003		6.5000e-003	6.5000e-003	0.0000	11.2782	11.2782	3.4000e-003	0.0000	11.3632

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>0.0114</b>	<b>0.1150</b>	<b>0.0838</b>	<b>1.2000e-004</b>		<b>7.0600e-003</b>	<b>7.0600e-003</b>		<b>6.5000e-003</b>	<b>6.5000e-003</b>	<b>0.0000</b>	<b>11.2782</b>	<b>11.2782</b>	<b>3.4000e-003</b>	<b>0.0000</b>	<b>11.3632</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-005	1.0300e-003	3.2000e-004	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0872	0.0872	1.0000e-005	0.0000	0.0875
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	7.0000e-005	9.7000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0765	0.0765	1.0000e-005	0.0000	0.0766
<b>Total</b>	<b>1.9000e-004</b>	<b>1.1000e-003</b>	<b>1.2900e-003</b>	<b>0.0000</b>	<b>5.0000e-005</b>	<b>0.0000</b>	<b>6.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.1636</b>	<b>0.1636</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.1641</b>

**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	5.0600e-003	0.1077	0.0898	1.2000e-004		3.8200e-003	3.8200e-003		3.8200e-003	3.8200e-003	0.0000	11.2782	11.2782	3.4000e-003	0.0000	11.3632
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>5.0600e-003</b>	<b>0.1077</b>	<b>0.0898</b>	<b>1.2000e-004</b>		<b>3.8200e-003</b>	<b>3.8200e-003</b>		<b>3.8200e-003</b>	<b>3.8200e-003</b>	<b>0.0000</b>	<b>11.2782</b>	<b>11.2782</b>	<b>3.4000e-003</b>	<b>0.0000</b>	<b>11.3632</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-005	1.0300e-003	3.2000e-004	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0872	0.0872	1.0000e-005	0.0000	0.0875
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	7.0000e-005	9.7000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0765	0.0765	1.0000e-005	0.0000	0.0766
<b>Total</b>	<b>1.9000e-004</b>	<b>1.1000e-003</b>	<b>1.2900e-003</b>	<b>0.0000</b>	<b>5.0000e-005</b>	<b>0.0000</b>	<b>6.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.1636</b>	<b>0.1636</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.1641</b>

### 3.8 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	0.1267					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0155	0.1084	0.1045	1.7000e-004		7.8000e-003	7.8000e-003		7.7800e-003	7.7800e-003	0.0000	14.4173	14.4173	1.7000e-003	0.0000	14.4598
<b>Total</b>	<b>0.1422</b>	<b>0.1084</b>	<b>0.1045</b>	<b>1.7000e-004</b>		<b>7.8000e-003</b>	<b>7.8000e-003</b>		<b>7.7800e-003</b>	<b>7.7800e-003</b>	<b>0.0000</b>	<b>14.4173</b>	<b>14.4173</b>	<b>1.7000e-003</b>	<b>0.0000</b>	<b>14.4598</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					





San Pedro Residential, Pacifica, CA

DPM Emissions and Modeling Emission Rates

Emissions Model 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)		
2017	Construction	0.1160	DPM	232.0	0.07062	8.90E-03	10,537	8.45E-07
2018	Construction	0.0078	DPM	15.6	0.00475	5.98E-04	10,537	5.68E-08
<b>2017-2018</b>		<b>0.1238</b>	<b>DPM</b>	<b>247.6</b>	<b>0.0754</b>	<b>0.0095</b>	10,537	9.01E-07

Operation Hours

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

San Pedro Residential, Pacifica, CA

PM2.5 Fugitive Dust Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions				Modeled Area (m <sup>2</sup> )	PM2.5 Emission Rate (g/s/m <sup>2</sup> )
			(ton/year)	(lb/yr)	(lb/hr)	(g/s)		
2017	Construction	FUG	0.0285	57.0	0.01735	2.19E-03	10,537	2.07E-07
2018	Construction	FUG	0.0000	0.0	0.00000	0.00E+00	10,537	0.00E+00
<b>2017-2018</b>			<b>0.0285</b>	<b>57.0</b>	<b>0.0174</b>	<b>0.0022</b>	10,537	2.07E-07

Operation Hours

hr/day = 9 (7am - 4pm)  
 days/yr = 3.65E+02  
 hours/year = 3285

**San Pedro Residential, Pacifica, CA**  
**Maximum DPM Cancer Risk Calculations From Construction**  
**Impacts at Off-Site Receptors-1.5 meter**

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 =	0.85	0.85	0.72	0.72	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)	Fugitive PM2.5	Total PM2.5
			DPM Conc (ug/m3)		Age Sensitivity		Modeled		Age Sensitivity			
			Year	Annual	Factor		Year	Annual	Factor			
0	0.25	-0.25 - 0*		0.0000	10	0.00		0.0000	-	-		
1	1	0 - 1	2017-2018	0.2367	10	33.04	2017	0.2367	1	0.68	0.0980	0.335
2	1	1 - 2		0.0000	10	0.00		0.2367	1	0.68		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
<b>Total Increased Cancer Risk</b>						<b>33.04</b>				<b>1.36</b>		

\* Third trimester of pregnancy

**San Pedro Residential, Pacifica, CA**  
**Maximum DPM Cancer Risk Calculations From Construction**  
**Impacts at Off-Site Receptors-1.5 meter**

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 =	0.85	0.85	0.72	0.72	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)	Fugitive PM2.5	Total PM2.5
			DPM Conc (ug/m3)		Age Sensitivity		Modeled		Age Sensitivity			
			Year	Annual	Factor		Year	Annual	Factor			
0	0.25	-0.25 - 0*		0.0000	10	0.00		0.0000	-	-		
1	1	0 - 1	2017-2018	0.2044	10	28.54	2017-2018	0.2044	1	0.59	0.2004	0.405
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
<b>Total Increased Cancer Risk</b>						<b>28.54</b>				<b>0.59</b>		

\* Third trimester of pregnancy

**San Pedro Residential, Pacifica, CA**  
**Maximum DPM Cancer Risk Calculations From Construction**  
**Impacts at Linda Mar Rehabilitation Center-1.5 meter**

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 =	0.85	0.85	0.72	0.72	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)	Fugitive PM2.5	Total PM2.5	
			DPM Conc (ug/m3)		Age Sensitivity Factor		Modeled		Age Sensitivity Factor				
			Year	Annual			Year	Annual					
0	0.25	-0.25 - 0*		0.0000	10	0.00		0.0000	-	-			
1	1	0 - 1	2017-2018	0.0700	10	9.77	2017-2018	0.0700	1	0.20	0.0930	0.163	
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00	0.0000	0.000	0.000
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.00	0.0000	1	0.00		
<b>Total Increased Cancer Risk</b>						<b>9.77</b>			<b>0.20</b>				

\* Third trimester of pregnancy

**San Pedro Residential, Pacifica, CA - Health Impact Summary**

**Maximum Impacts at Construction MEI Location**

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index (-)	Maximum Annual PM2.5 Concentration ( $\mu\text{g}/\text{m}^3$ )
	Exhaust PM10/DPM ( $\mu\text{g}/\text{m}^3$ )	Fugitive PM2.5 ( $\mu\text{g}/\text{m}^3$ )	Child	Adult		
	2017-2018	0.2367	0.2004	33.0	0.7	0.047
<b>Maximum</b>	0.2367	0.2004	33.0	0.7	0.047	0.40

**Maximum Impacts at Linda Mar Rehabilitation Center**

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index (-)	Maximum Annual PM2.5 Concentration ( $\mu\text{g}/\text{m}^3$ )
	Exhaust PM10/DPM ( $\mu\text{g}/\text{m}^3$ )	Fugitive PM2.5 ( $\mu\text{g}/\text{m}^3$ )	Child	Adult		
	2017-2018	0.0700	0.0930	9.8	0.2	0.014
<b>Maximum</b>	0.0700	0.0930	9.8	0.2	0.014	0.16