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January 9, 2018

Mr. Geoffrey Forner
Townsend Capital Partners LLC
1101 Fifth Avenue, Ste. 300
San Rafael, CA 94901

VIA E-MAIL: **gforner@monahanpacific.com**

SUBJECT: Townsend Assisted Living and Memory Facility, Cotati, CA – Evaluation of Air Quality and Greenhouse Gas Emissions

Dear Mr. Forner:

This letter summarizes our assessment of potential air quality and greenhouse gas (GHG) issues associated with the Townsend Assisted Living and Memory Facility project proposed in Cotati, California. It is our understanding that the project is proposing the construction and operation of a 120-unit assisted living facility, as well as a 6,000 SF commercial building on site. We assume the commercial building would be a small office-type building.

This assessment is an update to our preliminary evaluation, dated May 13, 2016[1]*. In that assessment, impacts to air quality and GHG were addressed. The previous evaluation identified two impacts that needed further evaluation when project plans were available. Those included a quantified assessment of construction impacts to sensitive receptors (e.g., nearby residences) and an assessment of impacts from nearby air pollutant sources upon the project. This update addresses those issues.*

Air Quality Setting

The project is located in the portion of Sonoma County that is part of the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$). In Sonoma County, measured levels of air pollutants are below air quality standards, including ozone, PM_{10} and $PM_{2.5}$.

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of

[1] Illingworth & Rodkin, Inc. 2016. Sterling Senior Communities, Cotati, CA – Qualitative Evaluation of Air Quality and Greenhouse Gas Emissions. May 13.

the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

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

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 listed above. 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 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 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.[2] The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The Bay Area Air Quality Management District (BAAQMD) is the regional agency tasked with managing air quality in the region. At the State level, the California Air Resources Board (a part of the California Environmental Protection Agency) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published CEQA Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[3]

[2] Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed: April 30, 2014.
[3] Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May. These guidelines were updated in May 2017.

Greenhouse Gas Emissions Setting

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by humankind) atmospheric gases, such as water vapor, carbon dioxide, methane, and nitrous oxide. Gases that trap heat in the atmosphere are called GHGs. Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. GHGs, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the greenhouse effect. The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere, and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or global climate change. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred because it implies that there are other consequences to the global climate in addition to rising temperatures. Other than water vapor, the primary GHGs contributing to global climate change include the following gases:

- Carbon dioxide (CO_2), primarily a byproduct of fuel combustion;
- Nitrous oxide (N_2O), a byproduct of fuel combustion; also associated with agricultural operations such as the fertilization of crops;
- Methane (CH_4), commonly created by off-gassing from agricultural practices (e.g. livestock), wastewater treatment and landfill operations;
- Chlorofluorocarbons (CFCs) were used as refrigerants, propellants and cleaning solvents, but their production has been mostly prohibited by international treaty;
- Hydrofluorocarbons (HFCs) are now widely used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

These gases vary considerably in terms of Global Warming Potential (GWP), a term developed to compare the propensity of each GHG to trap heat in the atmosphere relative to another GHG. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time of gas remains in the atmosphere. The GWP of each GHG is measured relative to CO_2. Accordingly, GHG emissions are typically measured and reported in terms of CO_2 equivalent (CO_2e). For instance, SF_6 is 22,800 times more intense in terms of global climate change contribution than CO_2.

The State of California is addressing the issue of GHG through legislation, policy guidance, and outreach programs. CO_2 is the primary GHG emitted from land use and industrial projects. In 2006 California enacted AB 32 – the Global Warming Solutions Act, which requires that statewide GHG emissions be reduced to 1990 levels by 2020. In 2008, the California Air Resources Board (CARB) adopted the Climate Change Scoping Plan in response to AB 32. This plan describes the strategies that the State will implement to reduce future emissions by 28% to meet the 1990 target goal in 2020. BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines

are used to assess GHG emissions from land use projects. BAAQMD's analysis of future land use development in the Bay Area and applicable AB 32 GHG reduction strategies lead to the development of emission-based significance thresholds for the projects in the Bay Area, which include Sonoma County.

Cotati General Plan

The 2013 Cotati General Plan Conservation Element includes an extensive list of policies and action measures that are aimed at improving air quality. Additionally, the General Plan Land Use Element and Land Use Map promotes a compact urban development pattern that emphasizes infill development, and ensures that land use patterns do to not expose sensitive receptors to unhealthy pollutant concentrations. Additionally, the Circulation Element includes a range of policies and action items that wouldeffectively reduce vehicle travel, through the use of complete streets and multi-modal transportation systems.

Applicable General Plan Policies:

- **Policy CON 2.1**: Improve air quality through continuing to require a compact development pattern that focuses growth in and around existing urbanized areas, locating new housing near places of employment, encouraging alternative modes of transportation, and requiring projects to mitigate significant air quality impacts.

- **Policy CON 2.2**: Minimize exposure of sensitive receptors to concentrations of air pollutant emissions and toxic air contaminants.

- **Policy CON 2.3**: Require discretionary projects involving sensitive receptors such as children, the elderly, or people with respiratory diseases proposed within 500 feet of the Highway 101 corridor to include an analysis of mobile source toxic air contaminant health risks. The analysis, if necessary, shall identify feasible mitigation measures to reduce health risks to acceptable levels.

- **Policy CON 2.4**: Require new development or significant remodels to install fireplaces, stoves, and/or heaters which meet current BAAQMD standards.

- **Policy CON 2.5**: Continue to require all construction projects and ground disturbing activities to implement BAAQMD dust control and abatement measures.

- **Policy CON 2.7**: Continue to aggressively implement the greenhouse gas (GHG) reduction measures contained in the 2008 Cotati Greenhouse Gas Emissions Reduction Action Plan.

- **Policy CON 3.1**: Continue to require all new public and privately constructed buildings to meet and comply with CALGreen Tier 1 standards.

- **Policy CON 3.2**: Support innovative and green building best management practices, including LEED certification, for all new development, and encourage project applicants to exceed CALGreen Tier 1 standards, if feasible.

- **Policy CON 3.3**: Promote the use of alternative energy sources in new development.

- **Policy CON 3.7**: Encourage tree planting, including widespread use of trees as windbreaks to maximize the effects of cooling westerly winds and planting of deciduous trees to help reduce summer temperatures, either in conjunction with new development or through private sector

participation.

- **Policy CON 3.8**: Promote water conservation among water users.

- **Policy CON 3.9**: Require the use of drought-tolerant and regionally native plants in landscaping.

- **Policy CON 3.10**: Ensure that the layout and design of new development and significant remodels encourages the use of transportation modes other than automobiles and trucks.

- **Policy CON 3.16**: Improve and maintain landscaping around commercial areas in order to minimize the "heat island" effect, provide shade, soften the harshness of such commercial areas, and create a more leisurely ambience.

- **Policy LU 2.3**: Locate residences away from areas of excessive noise, smoke, or dust, and ensure that adequate provisions, including a buffer or transitional uses, are made to ensure the health and well-being of existing and future residents.

Cotati Greenhouse Gas Reduction Plan

The City of Cotati developed a *Greenhouse Gas Emissions Reduction Action Plan Analysis* as a way to reduce City GHG emissions. These apply to City actions and not those of private developments.

Green Building Standards

CALGreen is a set of mandatory green building standards for new construction that went into effect throughout California on January 1, 2011. The 2013 California Green Building Standards Code went into effect on January 1, 2014. New, more stringent standards went into effect in January 2017. These building standards apply to all new public and privately-constructed commercial and residential buildings. CALGreen is referred to officially as the California Green Building Standards Code and includes a matrix of mandatory requirements tailored to residential and non-residential building classifications, as well as two sets of voluntary measures (CALGreen Tier 1 and Tier 2) that provide a host of more stringent sustainable building practices and features. Cotati's City Council rescinded Cotati's *Sustainable Building Program* and replaced it with the CALGreen Mandatory plus Tier 1, which includes a detailed list of green building features that address energy efficiency, water efficiency, waste reduction, material conservation and indoor air quality. The requirements apply to new construction of residential and non-residential facilities. Among the key mandatory provisions are requirements that new buildings:

- reduce indoor potable water use by at least 20% below current standards;
- recycle or salvage at least 50% of construction waste;
- utilize low VOC-emitting finish materials and flooring systems;
- install separate water meters tracking non-residential indoor and outdoor water use;
- utilize moisture-sensing irrigation systems for larger landscape areas;
- mandatory inspections by local officials of building energy systems, such as HVAC and mechanical equipment, to verify performance for non-residential buildings exceeding 10,000 square feet; and
- include parking for fuel-efficient and carpool vehicles.

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). In response to legal challenges, BAAQMD updated the significance thresholds in 2017. These are summarized in Table 1. Note that the California Supreme Court ruled that CEQA generally does not require an analysis of the effects of existing environmental conditions (e.g., air quality) on a project unless the project would exacerbate those conditions somehow through its construction and/or operation. The City's General Plan, however, includes policies to improve air quality in Cotati. This includes Policy CON 2.23 that new development should protect citizens from unnecessary exposure to air pollutants. Therefore, the significance thresholds (including those that address impacts to the project from the existing environment) contained in the 2017 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)
Criteria Air Pollutants			
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	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 BMPs	Not Applicable	
Single-Source Contribution - Health Risks and Hazards for New Sources or New Receptors			
Excess Cancer Risk	> 10.0 per one million		
Hazard Index	> 1.0		
Annual Average $PM_{2.5}$	> 0.3 µg/m^3		
Cumulative Health Risks and Hazards for Sensitive Receptors			
Excess Cancer Risk	> 100.0 per one million		
Chronic Hazard Index	> 10.0		
Annual Average $PM_{2.5}$	> 0.8 µg/m^3		
Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.			

Air Quality and GHG Impacts Addressed

This section describes the air quality and greenhouse gas (GHG) emission and any issues this project may have that would warrant mitigation measures.

Impact: Conflict with or obstruct implementation of the applicable air quality plan? ***Less-than-significant impact***

The project would need to comply with City requirements including applicable General Plan policies and implementing actions. Assuming there are no conflicts and the project does not have any other significant air quality or greenhouse gas emission impacts, a less-than-significant impact finding would be determined.

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 impact with construction-period mitigation measures.***

Due to the project size, construction exhaust and operational period emissions would be less than significant. In their 2017 update to the CEQA Air Quality Guidelines, BAAQMD identified the size of land use projects that could result in significant air pollutant emissions. For construction exhaust impacts, the Congregate Care facility project screening size was identified at 240 dwelling units. For operational impacts, the project size was identified at 657 dwelling units. Since the project proposes 125 dwelling units and a small amount of commercial space related to the project, it is concluded that emissions would be below the BAAQMD significance thresholds for both construction exhaust and operational emissions.

Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soil. 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, described later in this study provides construction control measures that represent best management practices recommended by BAAQMD for this project.

Impact: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? ***Less-than-significant impact.***

As discussed above, the project would have emissions less than the BAAQMD thresholds for ozone (i.e., ozone precursors) and particulate matter. Therefore, the project would not contribute substantially to existing or projected violations of those standards. Carbon monoxide emissions from traffic would be the criteria air pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since

the early 1990s. As a result, the region has been designated as attainment for the standard. Intersections affected by the project would have traffic volumes far less than the BAAQMD screening criteria and, thus, would not cause a violation of an ambient air quality standard or have a considerable contribution to cumulative violations of these standards.

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

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.

Sources Affecting the Proposed Project

The project would include sensitive receptors. 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. This influence area and sources within it are depicted in Figure 1. As shown in Figure 1, there are two sources that are addressed: State Route 116 and a gasoline tank operated by Shamrock Materials. A screening review of nearby sources indicate that they would not pose a significant effect on the site.

Figure 1 TAC Influence Area

BAAQMD provides a Google Earth Highway Screening Tool that predicts screening level cancer risk, non-cancer hazards and annual PM2.5 concentrations near roadways. The portion of Highway 116 near the project site is represented by Link 632 (6ft elevation). At 200 feet north of the highway, where senior housing would be provided, the risks are reported as follows:

Cancer risk = less than 6.42 per million, Threshold = 10.0*
Hazard Index = less than 0.01, Threshold = 1.0
Annual PM2.5 = 0.053 micrograms per cubic meter, Threshold = 0.3
**Note cancer risk using infant and child sensitivity with 70-year exposure.*

Shamrock Materials Inc. operates a facility south of the project site, on the opposite side of Highway 116. The facility includes a gasoline storage tank that is listed as Plant #G255 by BAAQMD. This is a small facility and does not have screening levels listed by BAAQMD. Given the nature of the size and type of source, the gasoline tank likely has no effect on the project site, especially given that it is 350 feet or further from the project site.

Operation of the project is not expected to cause any localized emissions that could expose sensitive receptors to unhealthy air pollutant levels. Construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors that primarily include scattered rural residences to the north and a residential development to the northeast. A community risk assessment was conducted that modeled concentrations of $PM_{2.5,}$ DPM, and total from construction-related exhaust emissions, which are then used to evaluate potential cancer risk, non-cancer health hazards, and annual concentrations of $PM_{2.5}$.

<u>Construction Health Risk Methodology</u>

Construction period emissions were computed using CalEEMod along with projected construction activity, as described above. The CalEEMod model provided total construction period PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles) of 0.1887 tons (377 pounds) over the construction period. A trip length of one 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 $PM_{2.5}$ emissions were also computed and included in this analysis. The model predicts emissions of 0.0877 tons (175 pounds) of fugitive $PM_{2.5}$ over the construction period.

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) 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.[4] The ISCST3 modeling utilized two area sources to represent the on-site construction emissions, one for truck and off-road equipment exhaust emissions and one for fugitive dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of

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

the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area source. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. to 4 p.m., when the majority of construction activity would occur.

The modeling used a 5-year meteorological data set (1990-1994) from the BAAQMD Valley Ford meteorological monitoring station prepared for use with the ISCST3 model by the BAAQMD. The Valley Ford monitoring station is located about 9.7 miles south-southwest from the project site. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2018-2019 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptor locations. Receptor heights of 1.5 meters (4.9 feet) were used to represent the breathing heights of residents in nearby single-family homes and townhomes.

<u>Results - Construction Health Risk for Single Sources</u>

The maximum-modeled DPM and $PM_{2.5}$ concentrations occurred at a residence on Batkin Court northeast of the project site, as shown in Figure 1 for the maximally exposed individual (MEI). Using the maximum annual modeled DPM concentrations, the maximum increased cancer risks and non-cancer health impacts were calculated. Attachment 1 to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Results of this assessment indicate that the maximum excess residential cancer risks would be 57.6 in one million for an infant exposure and 1.0 in one million for an adult exposure. The maximum residential excess cancer risk 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.

The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhaust and fugitive dust emissions, was 0.63 $\mu g/m^3$, occurring at the residential MEI. The maximum annual $PM_{2.5}$ concentration at the MEI residential receptor location would be greater than the BAAQMD significance threshold of 0.3 $\mu g/m^3$. Implementation of Mitigation Measures 1 and 2 would reduce this impact to a level of less than significant.

The maximum modeled annual residential DPM concentration (i.e., from construction exhaust) was 0.35 $\mu g/m^3$. The maximum computed HI based on this DPM concentration is 0.07, which is much lower than the BAAQMD significance criterion of a HI greater than 1.0.

<u>Results - Construction Health Risk for Combined Sources</u>

The only other source near the project that would present a risk to nearby sensitive receptors is Highway 116 traffic. Using the same BAAQMD Highway Screening Tool, risk from that source were predicted and combined with the proposed project construction activity (see Table 2).

Table 2. Community Risk Impacts to New Project Residences

Source	*Maximum Cancer Risk (per million)*	*Maximum Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)*	*Maximum Hazard Index*
Project Construction:			
Unmitigated	*~1.0 to 57.6*	*0.63*	*0.07*
Mitigated	*<1.0 to 5.7*	*0.16*	*0.01*
Highway 116, based on BAAQMD Google Earth Highway Screening Tool for Link 632 (6ft) at 500 feet	*4.9*	*0.03*	*0.00*
Cumulative Total:			
Unmitigated	*5.9 to 62.5*	*0.68*	*0.07*
Mitigated	*<5.9 to 10.6*	*0.19*	*0.01*
BAAQMD Threshold – Cumulative Sources	*>100*	*>0.8*	*>10.0*
Significant?	*No*	*No*	*No*

Construction Mitigation Measures

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.*

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 80 percent reduction in $PM_{2.5}$ exhaust emissions or more. One feasible plan to achieve this reduction would include the following:

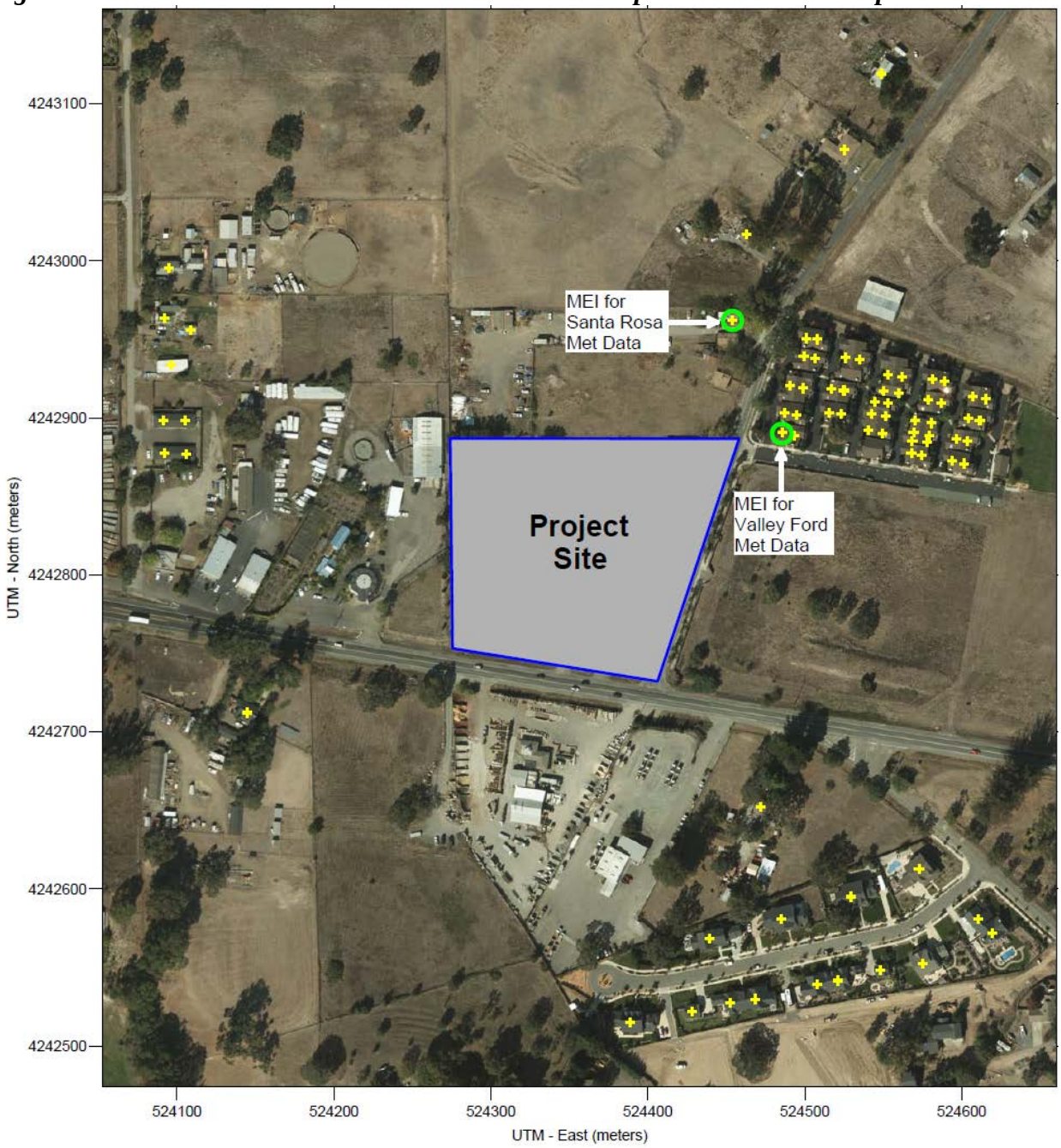
All mobile diesel-powered off-road equipment larger than 50 horsepower and operating on the site for more than two days shall meet, at a minimum, U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent. Alternatively, construction contractors could use other measures to minimize construction period DPM emission to reduce the predicted cancer risk below the thresholds. The use of equipment that meets U.S. EPA particulate matter emissions standards for Tier 2 or 3 engines (or equivalent) and includes CARB-certified Level 3 Diesel Particulate Filters[5] 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.

<u>*Effectiveness of Mitigation Measures 1 and 2*</u>

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 by about 90 percent. This would reduce the maximum cancer risk such that the mitigated risk would be less than 5.7 in one million and the maximum $PM_{2.5}$ concentration would be reduced to less than 0.16 $\mu g/m^3$. After implementation of these mitigation measures, the project would have a less-than-significant impact with respect to community risk caused by construction activities.

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

Figure 2. Construction Area Modeled and Maximum Impacted Sensitive Receptors



Impact 6: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less than significant***

As with criteria air pollutant emissions, BAAQMD has identified project screening sizes for assessing whether a project might result in potentially significant greenhouse gas emissions. Due to the project size, construction exhaust and operational period emissions would be less than significant. In their 2017 update to the CEQA Air Quality Guidelines, BAAQMD identified the size of land use projects that could result in significant air pollutant emissions. For greenhouse gas emission impacts, the Congregate Care facility project screening size was identified at 143 dwelling units. While the project size could fluctuate during the planning stage, we would expect less-than-significant impacts for several reasons: (1) the screening sizes are based on older modeling with higher emissions rates, (2) congregate care facilities tend to result in relatively low trips rates and traffic from land use projects tends to be the primary source of GHG emissions, and (3) the project includes residents so a per capita emissions would apply instead if the project has significant emissions and these types of projects, with City-required reduction measures, would have low per capita emissions.

The CalEEMod modeling for the proposed project, included in Attachment 1, shows total direct and indirect GHG emissions from the project at 556 metric tons during operation in 2020. This is well below the bright-line threshold of 1,100 metric tons annually.

Impact 7: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? L***ess than significant***

The project would be subject to City requirements and policies and new requirements under rule making developed at the State and local level regarding greenhouse gas emissions and are subject to local policies that may affect emissions of greenhouse gases. This type of project is not anticipated to conflict with any strategy to reduce greenhouse gas emissions.

♦ ♦ ♦

This concludes our letter. Please feel free to contact me with any questions.

Sincerely,

James A. Reyff
Principal Consultant
ILLINGWORTH & RODKIN, INC.

(17-234 & 16-083)

Attachment: Construction Risk Assessment

Attachment Information

Reds Assisted Living, Cotati, CA

DPM Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018-2019	Construction	0.1887	CON_DPM	377.4	0.11489	1.45E-02	22,923	6.31E-07

Operation Hours

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

PM2.5 Fugitive Dust Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2018-2019	Construction	CON_FUG	0.08773	175.5	0.05341	6.73E-03	22,923	2.94E-07

Operation Hours

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

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018-2019	Construction	0.0186	CON_DPM	37.2	0.01131	1.43E-03	22,923	6.22E-08

Construction Hours

hr/day =	10	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2018-2019	Construction	CON_FUG	0.04123	82.5	0.02510	3.16E-03	22,923	1.38E-07

Construction Hours

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

Reds Assisted Living, Cotati, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Unmitigated

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2018-2019	0.3505	0.2822	**57.6**	**1.0**	**0.070**	**0.63**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2018-2019	0.0346	0.1325	**5.7**	**0.1**	**0.007**	**0.17**

Reds Assisted Living, Cotati, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					
			DPM Conc (ug/m3)				Modeled DPM Conc (ug/m3)					
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Age Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Age Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2018-2019	0.3505	10	57.56	2018-2019	0.3505	1	1.01	0.2822	0.633
2	1	1 - 2	2020	0.0000	10	0.00	2020	0.0000	1	0.00		
3	1	2 - 3	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
4	1	3 - 4	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
5	1	4 - 5	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
6	1	5 - 6	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
7	1	6 - 7	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
8	1	7 - 8	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
9	1	8 - 9	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
10	1	9 - 10	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
11	1	10 - 11	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
12	1	11 - 12	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
13	1	12 - 13	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
14	1	13 - 14	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
15	1	14 - 15	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
16	1	15 - 16	2034	0.0000	3	0.00	2034	0.0000	1	0.00		
17	1	16-17	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
18	1	17-18	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
19	1	18-19	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
20	1	19-20	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
21	1	20-21	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
22	1	21-22	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
23	1	22-23	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
24	1	23-24	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
25	1	24-25	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
26	1	25-26	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
27	1	26-27	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
28	1	27-28	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
29	1	28-29	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
30	1	29-30	2048	0.0000	1	0.00	2048	0.0000	1	0.00		
Total Increased Cancer Risk						**57.6**				**1.01**		

* Third trimester of pregnancy

Reds Assisted Living, Cotati, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
							Modeled					
Exposure Year	**Exposure Duration (years)**	**Age**	**DPM Conc (ug/m3) Year**	**DPM Conc (ug/m3) Annual**	**Age Sensitivity Factor**	**Cancer Risk (per million)**	**DPM Conc (ug/m3) Year**	**DPM Conc (ug/m3) Annual**	**Age Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2018-2019	0.0346	10	5.68	2018-2019	0.0346	1	0.10	0.1325	0.167
2	1	1 - 2	2017	0.0000	10	0.00	2017	0.0000	1	0.00		
3	1	2 - 3	2018	0.0000	3	0.00	2018	0.0000	1	0.00		
4	1	3 - 4	2019	0.0000	3	0.00	2019	0.0000	1	0.00		
5	1	4 - 5	2020	0.0000	3	0.00	2020	0.0000	1	0.00		
6	1	5 - 6	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
7	1	6 - 7	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
8	1	7 - 8	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
9	1	8 - 9	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
10	1	9 - 10	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
11	1	10 - 11	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
12	1	11 - 12	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
13	1	12 - 13	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
14	1	13 - 14	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
15	1	14 - 15	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
16	1	15 - 16	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
17	1	16-17	2032	0.0000	1	0.00	2032	0.0000	1	0.00		
18	1	17-18	2033	0.0000	1	0.00	2033	0.0000	1	0.00		
19	1	18-19	2034	0.0000	1	0.00	2034	0.0000	1	0.00		
20	1	19-20	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
21	1	20-21	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
22	1	21-22	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
23	1	22-23	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
24	1	23-24	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
25	1	24-25	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
26	1	25-26	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
27	1	26-27	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
28	1	27-28	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
29	1	28-29	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
30	1	29-30	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
Total Increased Cancer Risk						**5.7**				**0.10**		

* Third trimester of pregnancy

15160 Reds Parcel Assisted Living Memory - Sonoma-San Francisco County, Annual

15160 Reds Parcel Assisted Living Memory

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	6.00	1000sqft	0.00	6,000.00	0
Parking Lot	100.00	Space	0.00	40,000.00	0
Retirement Community	120.00	Dwelling Unit	5.63	110.00	343

1.2 Other Project Characteristics

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

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - Based on 12/20/2017 Phone conversation. Acreage assigned to assisted living

Construction Phase - added trenching

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Off-road Equipment - per Construction sheet

Grading - per Construction sheet

Demolition - added asphalt demo (70 tons) in trips as 10 trips

Trips and VMT - added asphalt demo trips (10), concrete & asphalt 100 + ~150 trips. Distance 1 mile for near and on-site travel

Construction Off-road Equipment Mitigation - Tier 2/DPF 3BMP

Area Mitigation -

Energy Mitigation - High efficiency lighting for new Title 24 standards

Water Mitigation - water efficiency

Waste Mitigation - Include recycling programs

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblGrading	MaterialImported	0.00	5,420.00
tblLandUse	LandUseSquareFeet	120,000.00	110.00
tblLandUse	LotAcreage	0.14	0.00

tblLandUse	LotAcreage	0.90	0.00
tblLandUse	LotAcreage	24.00	5.63
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	7.00	6.10
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	7.60
tblOffRoadEquipment	UsageHours	8.00	6.40
tblOffRoadEquipment	UsageHours	8.00	6.40
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	6.10
tblOffRoadEquipment	UsageHours	8.00	6.30
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripNumber	64.00	74.00
tblTripsAndVMT	HaulingTripNumber	0.00	250.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00

tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1495	1.4577	0.9283	1.5300e-003	0.1665	0.0789	0.2454	0.0854	0.0734	0.1588	0.0000	137.8276	137.8276	0.0364	0.0000	138.7366
2019	0.2588	1.9410	1.6284	2.5700e-003	8.5500e-003	0.1098	0.1184	2.3300e-003	0.1032	0.1055	0.0000	226.3441	226.3441	0.0532	0.0000	227.6748
Maximum	**0.2588**	**1.9410**	**1.6284**	**2.5700e-003**	**0.1665**	**0.1098**	**0.2454**	**0.0854**	**0.1032**	**0.1588**	**0.0000**	**226.3441**	**226.3441**	**0.0532**	**0.0000**	**227.6748**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0610	1.3206	0.9766	1.5300e-003	0.0768	6.4800e-003	0.0833	0.0389	6.4700e-003	0.0454	0.0000	137.8274	137.8274	0.0364	0.0000	138.7364
2019	0.1548	2.1878	1.7066	2.5700e-003	8.5500e-003	0.0121	0.0207	2.3300e-003	0.0121	0.0144	0.0000	226.3439	226.3439	0.0532	0.0000	227.6745
Maximum	**0.1548**	**2.1878**	**1.7066**	**2.5700e-003**	**0.0768**	**0.0121**	**0.0833**	**0.0389**	**0.0121**	**0.0454**	**0.0000**	**226.3439**	**226.3439**	**0.0532**	**0.0000**	**227.6745**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**47.16**	**-3.23**	**-4.95**	**0.00**	**51.23**	**90.15**	**71.42**	**52.95**	**89.50**	**77.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-1-2018**	**10-31-2018**	1.0565	0.8573
2	**11-1-2018**	**1-31-2019**	0.8091	0.7950
3	**2-1-2019**	**4-30-2019**	0.7314	0.7679
4	**5-1-2019**	**7-31-2019**	0.7569	0.7945
5	**8-1-2019**	**9-30-2019**	0.4023	0.4494
		Highest	1.0565	0.8573

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3347	0.0167	1.2762	8.1000e-004		0.0594	0.0594		0.0594	0.0594	5.4708	3.7045	9.1752	0.0102	3.6000e-004	9.5376
Energy	7.1300e-003	0.0612	0.0280	3.9000e-004		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	158.1220	158.1220	0.0101	3.1100e-003	159.3001
Mobile	0.1203	0.5921	1.3405	3.6500e-003	0.2794	4.9300e-003	0.2844	0.0752	4.6500e-003	0.0799	0.0000	335.2335	335.2335	0.0157	0.0000	335.6265

Waste						0.0000	0.0000		0.0000	0.0000	12.3378	0.0000	12.3378	0.7291	0.0000	30.5664
Water						0.0000	0.0000		0.0000	0.0000	2.8188	8.8943	11.7130	0.2904	7.0200e-003	21.0651
Total	**0.4621**	**0.6700**	**2.6447**	**4.8500e-003**	**0.2794**	**0.0693**	**0.3487**	**0.0752**	**0.0690**	**0.1442**	**20.6273**	**505.9542**	**526.5815**	**1.0556**	**0.0105**	**556.0956**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0583	0.0145	0.8967	7.0000e-005		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	6.2512	6.2512	1.5200e-003	9.0000e-005	6.3153
Energy	7.1300e-003	0.0612	0.0280	3.9000e-004		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	150.6014	150.6014	9.3600e-003	2.9500e-003	151.7144
Mobile	0.1203	0.5921	1.3405	3.6500e-003	0.2794	4.9300e-003	0.2844	0.0752	4.6500e-003	0.0799	0.0000	335.2335	335.2335	0.0157	0.0000	335.6265
Waste						0.0000	0.0000		0.0000	0.0000	9.8702	0.0000	9.8702	0.5833	0.0000	24.4531
Water						0.0000	0.0000		0.0000	0.0000	2.2550	7.4727	9.7277	0.2324	5.6200e-003	17.2124
Total	**0.1858**	**0.6678**	**2.2652**	**4.1100e-003**	**0.2794**	**0.0151**	**0.2945**	**0.0752**	**0.0148**	**0.0900**	**12.1252**	**499.5588**	**511.6840**	**0.8423**	**8.6600e-003**	**535.3217**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**59.81**	**0.33**	**14.35**	**15.26**	**0.00**	**78.19**	**15.54**	**0.00**	**78.51**	**37.57**	**41.22**	**1.26**	**2.83**	**20.21**	**17.45**	**3.74**

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	8/1/2018	8/28/2018	5	20	
2	Site Preparation	Site Preparation	8/29/2018	9/11/2018	5	10	

3	Grading	Grading	9/12/2018	10/9/2018	5	20	
4	Building Construction	Building Construction	10/10/2018	8/27/2019	5	230	
5	Paving	Paving	8/28/2019	9/24/2019	5	20	
6	Architectural Coating	Architectural Coating	9/25/2019	10/22/2019	5	20	
7	utilities	Trenching	9/12/2018	9/25/2018	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 223; Residential Outdoor: 74; Non-Residential Indoor: 9,000; Non-Residential Outdoor: 3,000; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	2.00	81	0.73
Demolition	Excavators	3	4.00	158	0.38
Demolition	Rubber Tired Dozers	2	4.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	6.10	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	7.60	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	6.10	97	0.37
Building Construction	Welders	1	6.30	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	6.40	132	0.36
Paving	Rollers	2	6.40	80	0.38

Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Architectural Coating	Aerial Lifts	1	6.00	63	0.31
utilities	Tractors/Loaders/Backhoes	1	4.00	97	0.37
utilities	Excavators	1	4.00	158	0.38

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	74.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	678.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	105.00	20.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	250.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	21.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
utilities	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Replace Ground Cover

Water Exposed Area

3.2 Demolition - 2018

Unmitigated Construction On-Site

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

Fugitive Dust					6.8900e-003	0.0000	6.8900e-003	1.0400e-003	0.0000	1.0400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0173	0.1818	0.1022	1.8000e-004		9.0300e-003	9.0300e-003		8.3600e-003	8.3600e-003	0.0000	16.2179	16.2179	4.7300e-003	0.0000	16.3363
Total	**0.0173**	**0.1818**	**0.1022**	**1.8000e-004**	**6.8900e-003**	**9.0300e-003**	**0.0159**	**1.0400e-003**	**8.3600e-003**	**9.4000e-003**	**0.0000**	**16.2179**	**16.2179**	**4.7300e-003**	**0.0000**	**16.3363**

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-004	4.0400e-003	7.6000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.4164	0.4164	8.0000e-005	0.0000	0.4183
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**3.9000e-004**	**4.1800e-003**	**2.5800e-003**	**0.0000**	**1.4000e-004**	**1.0000e-005**	**1.5000e-004**	**4.0000e-005**	**1.0000e-005**	**5.0000e-005**	**0.0000**	**0.5531**	**0.5531**	**9.0000e-005**	**0.0000**	**0.5552**

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					3.1000e-003	0.0000	3.1000e-003	4.7000e-004	0.0000	4.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7100e-003	0.1509	0.1137	1.8000e-004		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	16.2179	16.2179	4.7300e-003	0.0000	16.3362
Total	**5.7100e-003**	**0.1509**	**0.1137**	**1.8000e-004**	**3.1000e-003**	**6.1000e-004**	**3.7100e-003**	**4.7000e-004**	**6.1000e-004**	**1.0800e-003**	**0.0000**	**16.2179**	**16.2179**	**4.7300e-003**	**0.0000**	**16.3362**

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-004	4.0400e-003	7.6000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.4164	0.4164	8.0000e-005	0.0000	0.4183
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**3.9000e-004**	**4.1800e-003**	**2.5800e-003**	**0.0000**	**1.4000e-004**	**1.0000e-005**	**1.5000e-004**	**4.0000e-005**	**1.0000e-005**	**5.0000e-005**	**0.0000**	**0.5531**	**0.5531**	**9.0000e-005**	**0.0000**	**0.5552**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3800	17.3800	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0903**	**0.0129**	**0.1032**	**0.0497**	**0.0119**	**0.0615**	**0.0000**	**17.3800**	**17.3800**	**5.4100e-003**	**0.0000**	**17.5152**

Unmitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	9.0000e-005	1.0900e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0820	0.0820	1.0000e-005	0.0000	0.0822
Total	**1.8000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0820**	**0.0820**	**1.0000e-005**	**0.0000**	**0.0822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0500e-003	0.1686	0.1148	1.9000e-004		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	17.3799	17.3799	5.4100e-003	0.0000	17.5152
Total	**6.0500e-003**	**0.1686**	**0.1148**	**1.9000e-004**	**0.0407**	**7.1000e-004**	**0.0414**	**0.0223**	**7.1000e-004**	**0.0231**	**0.0000**	**17.3799**	**17.3799**	**5.4100e-003**	**0.0000**	**17.5152**

Mitigated Construction Off-Site

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

Total	**1.8000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0820**	**0.0820**	**1.0000e-005**	**0.0000**	**0.0822**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0658	0.0000	0.0658	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.3067	0.1658	3.0000e-004		0.0155	0.0155		0.0143	0.0143	0.0000	27.1069	27.1069	8.4400e-003	0.0000	27.3178
Total	**0.0277**	**0.3067**	**0.1658**	**3.0000e-004**	**0.0658**	**0.0155**	**0.0813**	**0.0337**	**0.0143**	**0.0480**	**0.0000**	**27.1069**	**27.1069**	**8.4400e-003**	**0.0000**	**27.3178**

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	9.0000e-004	0.0370	6.9400e-003	4.0000e-005	2.9000e-004	8.0000e-005	3.7000e-004	8.0000e-005	8.0000e-005	1.6000e-004	0.0000	3.8151	3.8151	6.9000e-004	0.0000	3.8324
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**1.1900e-003**	**0.0371**	**8.7600e-003**	**4.0000e-005**	**4.0000e-004**	**8.0000e-005**	**4.8000e-004**	**1.1000e-004**	**8.0000e-005**	**1.9000e-004**	**0.0000**	**3.9517**	**3.9517**	**7.0000e-004**	**0.0000**	**3.9693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0296	0.0000	0.0296	0.0152	0.0000	0.0152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.2628	0.1899	3.0000e-004		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	27.1068	27.1068	8.4400e-003	0.0000	27.3178
Total	**0.0101**	**0.2628**	**0.1899**	**3.0000e-004**	**0.0296**	**1.1600e-003**	**0.0308**	**0.0152**	**1.1600e-003**	**0.0163**	**0.0000**	**27.1068**	**27.1068**	**8.4400e-003**	**0.0000**	**27.3178**

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	9.0000e-004	0.0370	6.9400e-003	4.0000e-005	2.9000e-004	8.0000e-005	3.7000e-004	8.0000e-005	8.0000e-005	1.6000e-004	0.0000	3.8151	3.8151	6.9000e-004	0.0000	3.8324
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.4000e-004	1.8200e-003	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1367	0.1367	1.0000e-005	0.0000	0.1369
Total	**1.1900e-003**	**0.0371**	**8.7600e-003**	**4.0000e-005**	**4.0000e-004**	**8.0000e-005**	**4.8000e-004**	**1.1000e-004**	**8.0000e-005**	**1.9000e-004**	**0.0000**	**3.9517**	**3.9517**	**7.0000e-004**	**0.0000**	**3.9693**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

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

Off-Road	0.0710	0.6246	0.4698	7.2000e-004		0.0403	0.0403		0.0379	0.0379	0.0000	63.5547	63.5547	0.0155	0.0000	63.9416
Total	**0.0710**	**0.6246**	**0.4698**	**7.2000e-004**		**0.0403**	**0.0403**		**0.0379**	**0.0379**	**0.0000**	**63.5547**	**63.5547**	**0.0155**	**0.0000**	**63.9416**

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	1.4800e-003	0.0449	0.0138	4.0000e-005	5.4000e-004	1.5000e-004	6.9000e-004	1.6000e-004	1.4000e-004	3.0000e-004	0.0000	4.2460	4.2460	6.9000e-004	0.0000	4.2634
Worker	6.0300e-003	2.9800e-003	0.0376	3.0000e-005	2.2800e-003	4.0000e-005	2.3200e-003	6.1000e-004	4.0000e-005	6.5000e-004	0.0000	2.8218	2.8218	2.2000e-004	0.0000	2.8274
Total	**7.5100e-003**	**0.0479**	**0.0514**	**7.0000e-005**	**2.8200e-003**	**1.9000e-004**	**3.0100e-003**	**7.7000e-004**	**1.8000e-004**	**9.5000e-004**	**0.0000**	**7.0678**	**7.0678**	**9.1000e-004**	**0.0000**	**7.0908**

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	0.0289	0.6304	0.4784	7.2000e-004		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	63.5546	63.5546	0.0155	0.0000	63.9415
Total	**0.0289**	**0.6304**	**0.4784**	**7.2000e-004**		**3.6200e-003**	**3.6200e-003**		**3.6200e-003**	**3.6200e-003**	**0.0000**	**63.5546**	**63.5546**	**0.0155**	**0.0000**	**63.9415**

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	1.4800e-003	0.0449	0.0138	4.0000e-005	5.4000e-004	1.5000e-004	6.9000e-004	1.6000e-004	1.4000e-004	3.0000e-004	0.0000	4.2460	4.2460	6.9000e-004	0.0000	4.2634
Worker	6.0300e-003	2.9800e-003	0.0376	3.0000e-005	2.2800e-003	4.0000e-005	2.3200e-003	6.1000e-004	4.0000e-005	6.5000e-004	0.0000	2.8218	2.8218	2.2000e-004	0.0000	2.8274
Total	**7.5100e-003**	**0.0479**	**0.0514**	**7.0000e-005**	**2.8200e-003**	**1.9000e-004**	**3.0100e-003**	**7.7000e-004**	**1.8000e-004**	**9.5000e-004**	**0.0000**	**7.0678**	**7.0678**	**9.1000e-004**	**0.0000**	**7.0908**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1814	1.6314	1.3303	2.0800e-003		0.1006	0.1006		0.0945	0.0945	0.0000	182.1429	182.1429	0.0441	0.0000	183.2459
Total	**0.1814**	**1.6314**	**1.3303**	**2.0800e-003**		**0.1006**	**0.1006**		**0.0945**	**0.0945**	**0.0000**	**182.1429**	**182.1429**	**0.0441**	**0.0000**	**183.2459**

Unmitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-003	0.1269	0.0355	1.3000e-004	1.5600e-003	3.7000e-004	1.9300e-003	4.5000e-004	3.5000e-004	8.1000e-004	0.0000	12.2957	12.2957	1.9300e-003	0.0000	12.3440
Worker	0.0159	7.5900e-003	0.0975	9.0000e-005	6.6000e-003	1.2000e-004	6.7200e-003	1.7700e-003	1.1000e-004	1.8700e-003	0.0000	7.9482	7.9482	5.7000e-004	0.0000	7.9624
Total	**0.0197**	**0.1345**	**0.1330**	**2.2000e-004**	**8.1600e-003**	**4.9000e-004**	**8.6500e-003**	**2.2200e-003**	**4.6000e-004**	**2.6800e-003**	**0.0000**	**20.2439**	**20.2439**	**2.5000e-003**	**0.0000**	**20.3064**

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	0.0839	1.8270	1.3865	2.0800e-003		0.0105	0.0105		0.0105	0.0105	0.0000	182.1427	182.1427	0.0441	0.0000	183.2457
Total	**0.0839**	**1.8270**	**1.3865**	**2.0800e-003**		**0.0105**	**0.0105**		**0.0105**	**0.0105**	**0.0000**	**182.1427**	**182.1427**	**0.0441**	**0.0000**	**183.2457**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-003	0.1269	0.0355	1.3000e-004	1.5600e-003	3.7000e-004	1.9300e-003	4.5000e-004	3.5000e-004	8.1000e-004	0.0000	12.2957	12.2957	1.9300e-003	0.0000	12.3440
Worker	0.0159	7.5900e-003	0.0975	9.0000e-005	6.6000e-003	1.2000e-004	6.7200e-003	1.7700e-003	1.1000e-004	1.8700e-003	0.0000	7.9482	7.9482	5.7000e-004	0.0000	7.9624

Total	**0.0197**	**0.1345**	**0.1330**	**2.2000e-004**	**8.1600e-003**	**4.9000e-004**	**8.6500e-003**	**2.2200e-003**	**4.6000e-004**	**2.6800e-003**	**0.0000**	**20.2439**	**20.2439**	**2.5000e-003**	**0.0000**	**20.3064**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0134	0.1381	0.1320	2.1000e-004		7.3500e-003	7.3500e-003		6.7800e-003	6.7800e-003	0.0000	18.5276	18.5276	5.7600e-003	0.0000	18.6717
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0134**	**0.1381**	**0.1320**	**2.1000e-004**		**7.3500e-003**	**7.3500e-003**		**6.7800e-003**	**6.7800e-003**	**0.0000**	**18.5276**	**18.5276**	**5.7600e-003**	**0.0000**	**18.6717**

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	0.0133	2.3600e-003	1.0000e-005	1.1000e-004	3.0000e-005	1.3000e-004	3.0000e-005	2.0000e-005	5.0000e-005	0.0000	1.4067	1.4067	2.5000e-004	0.0000	1.4129
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	1.5000e-004	1.9600e-003	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1594	0.1594	1.0000e-005	0.0000	0.1597
Total	**6.3000e-004**	**0.0134**	**4.3200e-003**	**1.0000e-005**	**2.4000e-004**	**3.0000e-005**	**2.6000e-004**	**7.0000e-005**	**2.0000e-005**	**9.0000e-005**	**0.0000**	**1.5661**	**1.5661**	**2.6000e-004**	**0.0000**	**1.5726**

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	0.1770	0.1526	2.1000e-004		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	18.5276	18.5276	5.7600e-003	0.0000	18.6717
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1800e-003**	**0.1770**	**0.1526**	**2.1000e-004**		**8.7000e-004**	**8.7000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**18.5276**	**18.5276**	**5.7600e-003**	**0.0000**	**18.6717**

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	0.0133	2.3600e-003	1.0000e-005	1.1000e-004	3.0000e-005	1.3000e-004	3.0000e-005	2.0000e-005	5.0000e-005	0.0000	1.4067	1.4067	2.5000e-004	0.0000	1.4129
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	1.5000e-004	1.9600e-003	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1594	0.1594	1.0000e-005	0.0000	0.1597
Total	**6.3000e-004**	**0.0134**	**4.3200e-003**	**1.0000e-005**	**2.4000e-004**	**3.0000e-005**	**2.6000e-004**	**7.0000e-005**	**2.0000e-005**	**9.0000e-005**	**0.0000**	**1.5661**	**1.5661**	**2.6000e-004**	**0.0000**	**1.5726**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

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

Archit. Coating	0.0404					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9700e-003	0.0234	0.0266	4.0000e-005		1.4100e-003	1.4100e-003		1.4000e-003	1.4000e-003	0.0000	3.6777	3.6777	5.7000e-004	0.0000	3.6920
Total	**0.0434**	**0.0234**	**0.0266**	**4.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**3.6777**	**3.6777**	**5.7000e-004**	**0.0000**	**3.6920**

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	3.7000e-004	1.8000e-004	2.2800e-003	0.0000	1.5000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1859	0.1859	1.0000e-005	0.0000	0.1863
Total	**3.7000e-004**	**1.8000e-004**	**2.2800e-003**	**0.0000**	**1.5000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1859**	**0.1859**	**1.0000e-005**	**0.0000**	**0.1863**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0404					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7300e-003	0.0357	0.0278	4.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	3.6777	3.6777	5.7000e-004	0.0000	3.6920
Total	**0.0421**	**0.0357**	**0.0278**	**4.0000e-005**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**3.6777**	**3.6777**	**5.7000e-004**	**0.0000**	**3.6920**

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	3.7000e-004	1.8000e-004	2.2800e-003	0.0000	1.5000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1859	0.1859	1.0000e-005	0.0000	0.1863
Total	**3.7000e-004**	**1.8000e-004**	**2.2800e-003**	**0.0000**	**1.5000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1859**	**0.1859**	**1.0000e-005**	**0.0000**	**0.1863**

3.8 utilities - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3900e-003	0.0143	0.0141	2.0000e-005		8.4000e-004	8.4000e-004		7.7000e-004	7.7000e-004	0.0000	1.8908	1.8908	5.9000e-004	0.0000	1.9055
Total	**1.3900e-003**	**0.0143**	**0.0141**	**2.0000e-005**		**8.4000e-004**	**8.4000e-004**		**7.7000e-004**	**7.7000e-004**	**0.0000**	**1.8908**	**1.8908**	**5.9000e-004**	**0.0000**	**1.9055**

Unmitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	2.0000e-005	3.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0228	0.0228	0.0000	0.0000	0.0228
Total	**5.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0000**	**0.0228**

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	8.7000e-004	0.0186	0.0157	2.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	1.8908	1.8908	5.9000e-004	0.0000	1.9055
Total	**8.7000e-004**	**0.0186**	**0.0157**	**2.0000e-005**		**1.0000e-004**	**1.0000e-004**		**1.0000e-004**	**1.0000e-004**	**0.0000**	**1.8908**	**1.8908**	**5.9000e-004**	**0.0000**	**1.9055**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	2.0000e-005	3.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0228	0.0228	0.0000	0.0000	0.0228

Total	**5.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0000**	**0.0228**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1203	0.5921	1.3405	3.6500e-003	0.2794	4.9300e-003	0.2844	0.0752	4.6500e-003	0.0799	0.0000	335.2335	335.2335	0.0157	0.0000	335.6265
Unmitigated	0.1203	0.5921	1.3405	3.6500e-003	0.2794	4.9300e-003	0.2844	0.0752	4.6500e-003	0.0799	0.0000	335.2335	335.2335	0.0157	0.0000	335.6265

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	66.18	14.76	6.30	120,157	120,157
Parking Lot	0.00	0.00	0.00		
Retirement Community	288.00	243.60	234.00	632,700	632,700
Total	354.18	258.36	240.30	752,857	752,857

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Retirement Community	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
Parking Lot	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190
Retirement Community	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	80.0501	80.0501	8.0100e-003	1.6600e-003	80.7438
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	87.5706	87.5706	8.7600e-003	1.8100e-003	88.3295
NaturalGas Mitigated	7.1300e-003	0.0612	0.0280	3.9000e-004		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	70.5513	70.5513	1.3500e-003	1.2900e-003	70.9706
NaturalGas Unmitigated	7.1300e-003	0.0612	0.0280	3.9000e-004		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	70.5513	70.5513	1.3500e-003	1.2900e-003	70.9706

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	98220	5.3000e-004	4.8100e-003	4.0400e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.2414	5.2414	1.0000e-004	1.0000e-004	5.2725
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Retirement Community	1.22386e+006	6.6000e-003	0.0564	0.0240	3.6000e-004		4.5600e-003	4.5600e-003		4.5600e-003	4.5600e-003	0.0000	65.3099	65.3099	1.2500e-003	1.2000e-003	65.6980
Total		**7.1300e-003**	**0.0612**	**0.0280**	**3.9000e-004**		**4.9300e-003**	**4.9300e-003**		**4.9300e-003**	**4.9300e-003**	**0.0000**	**70.5513**	**70.5513**	**1.3500e-003**	**1.3000e-003**	**70.9706**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	98220	5.3000e-004	4.8100e-003	4.0400e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.2414	5.2414	1.0000e-004	1.0000e-004	5.2725
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Retirement Community	1.22386e+006	6.6000e-003	0.0564	0.0240	3.6000e-004		4.5600e-003	4.5600e-003		4.5600e-003	4.5600e-003	0.0000	65.3099	65.3099	1.2500e-003	1.2000e-003	65.6980
Total		**7.1300e-003**	**0.0612**	**0.0280**	**3.9000e-004**		**4.9300e-003**	**4.9300e-003**		**4.9300e-003**	**4.9300e-003**	**0.0000**	**70.5513**	**70.5513**	**1.3500e-003**	**1.3000e-003**	**70.9706**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	106980	14.0723	1.4100e-003	2.9000e-004	14.1943

Parking Lot	14000	1.8416	1.8000e-004	4.0000e-005	1.8575
Retirement Community	544745	71.6567	7.1700e-003	1.4800e-003	72.2777
Total		**87.5706**	**8.7600e-003**	**1.8100e-003**	**88.3295**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	100462	13.2149	1.3200e-003	2.7000e-004	13.3294
Parking Lot	10080	1.3259	1.3000e-004	3.0000e-005	1.3374
Retirement Community	498011	65.5093	6.5500e-003	1.3600e-003	66.0769
Total		**80.0501**	**8.0000e-003**	**1.6600e-003**	**80.7438**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0583	0.0145	0.8967	7.0000e-005		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	6.2512	6.2512	1.5200e-003	9.0000e-005	6.3153

Unmitigated	0.3347	0.0167	1.2762	8.1000e-004		0.0594	0.0594		0.0594	0.0594	5.4708	3.7045	9.1752	0.0102	3.6000e-004	9.5376

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.0400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0265					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.2769	6.3700e-003	0.3813	7.6000e-004		0.0545	0.0545		0.0545	0.0545	5.4708	2.2471	7.7179	8.7900e-003	3.6000e-004	8.0446
Landscaping	0.0273	0.0104	0.8950	5.0000e-005		4.9200e-003	4.9200e-003		4.9200e-003	4.9200e-003	0.0000	1.4574	1.4574	1.4200e-003	0.0000	1.4930
Total	**0.3347**	**0.0167**	**1.2762**	**8.1000e-004**		**0.0594**	**0.0594**		**0.0594**	**0.0594**	**5.4708**	**3.7045**	**9.1752**	**0.0102**	**3.6000e-004**	**9.5376**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.0400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0265					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7938	4.7938	9.0000e-005	9.0000e-005	4.8223
Landscaping	0.0273	0.0104	0.8950	5.0000e-005		4.9200e-003	4.9200e-003		4.9200e-003	4.9200e-003	0.0000	1.4574	1.4574	1.4200e-003	0.0000	1.4930

Total	**0.0583**	**0.0145**	**0.8967**	**8.0000e-005**		**5.2500e-003**	**5.2500e-003**		**5.2500e-003**	**5.2500e-003**	**0.0000**	**6.2512**	**6.2512**	**1.5100e-003**	**9.0000e-005**	**6.3153**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.7277	0.2324	5.6200e-003	17.2124
Unmitigated	11.7130	0.2904	7.0200e-003	21.0651

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	1.0664 / 0.653602	1.3983	0.0349	8.4000e-004	2.5207

Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Retirement Community	7.81848 / 4.92904	10.3147	0.2556	6.1800e-003	18.5444
Total		**11.7130**	**0.2904**	**7.0200e-003**	**21.0651**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0.853122 / 0.613732	1.1604	0.0279	6.7000e-004	2.0587
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Retirement Community	6.25479 / 4.62837	8.5672	0.2045	4.9500e-003	15.1537
Total		**9.7277**	**0.2324**	**5.6200e-003**	**17.2124**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.8702	0.5833	0.0000	24.4531

Unmitigated	12.3378	0.7291	0.0000	30.5664

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	5.58	1.1327	0.0669	0.0000	2.8062
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Retirement Community	55.2	11.2051	0.6622	0.0000	27.7602
Total		**12.3378**	**0.7291**	**0.0000**	**30.5664**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	4.464	0.9062	0.0536	0.0000	2.2450
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Retirement Community	44.16	8.9641	0.5298	0.0000	22.2081
Total		**9.8702**	**0.5833**	**0.0000**	**24.4531**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Project Name: Cotati Assisted Living Memory

Project Size

120 Dwelling Units | 5.63 total project acres disturbed

110000 s.f. residential | - s.f. retail

6,000 s.f. office/commercial | - s.f. other, specify:

_____ s.f. other, specify: Assisted Living

_____ s.f. parking lot | 100 spaces

Construction Hours 8 am to 430 pm

Complete ALL Portions in Yellow

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Comments
	Demolition	**Start Date:**	e.g., 9/1/2016	**Total phase:**	**20**		**Overall Import/Export Volumes**
		End Date:					
1	Concrete/Industrial Saws	81	0.73	8	5	2	**Demolition Volume**
3	Excavators	162	0.38	8	10	4	Square footage of buildings to be demolished
2	Rubber-Tired Dozers	255	0.4	8	10	4	(*or* total tons to be hauled)
	Tractors/Loaders/Backhoes	97	0.37	8	10	4	14,000 square feet *or*
							? Hauling volume (tons)
	Site Preperation	**Start Date:**		**Total phase:**	**10**		Any pavement demolished and hauled? 70 tons
		End Date:					**Soil Hauling Volume**
	Graders	174	0.41			0	
3	Rubber Tired Dozers	255	0.4	8	10	8	Export volume = ? cubic yards?
4	Tractors/Loaders/Backhoes	97	0.37	8	10	8	Import volume = ? cubic yards?
	Grading / Excavation	**Start Date:**		**Total phase:**	**20**		
		End Date:					**Soil Hauling Volume**
	Scrapers	**361**	**0.48**			0	
1	Excavators	162	0.38	8	20	8	**Export volume = 0 cubic yards**
1	Graders	174	0.41	8	20	8	**Import volume = 5420 cubic yards**
1	Rubber Tired Dozers	255	0.4	8	20	8	
3	Tractors/Loaders/Backhoes	97	0.37	8	20	8	
	Other Equipment?						
	Trenching	**Start Date:**		**Total phase:**	**10**		
		End Date:					
	Tractor/Loader/Backhoe	97	0.37	8	5	4	
	Excavators	162	0.38	8	5	4	
	Other Equipment?						
	Building - Exterior	**Start Date:**		**Total phase:**	**230**		**Cement Trucks? ? Total Round-Trips**
		End Date:					
1	Cranes	226	0.29	7	200	6.087	Electric? (Y/N) ___ Otherwise assumed diesel
3	Forklifts	89	0.2	8	230	8.000	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8	220	7.652	Or temporary line power? (Y/N) ___
3	Tractors/Loaders/Backhoes	97	0.37	7	200	6.087	otherwise, assume diesel generator
1	Welders	46	0.45	8	180	6.261	
	Other Equipment?					0	
	Building - Interior/Architectural Coating	**Start Date:**		**Total phase:**	**20**		
		End Date:				20	
1	Air Compressors	78	0.48	8	20	8	
1	Aerial Lift	62	0.31	8	20	8	
	Other Equipment?						
	Paving	**Start Date:**		**Total phase:**	**10**		
		Start Date:					**Asphalt: 500 cubic yards or ____ round trips? Conc. curb: 2000 LF or ____ round trips? Conc. curb & gutter: 850 LF or ____ round trips? Conc. sidewalk: 150 cubic yards or ____ round trips? Pervious paver (EVA): 16000 SF or ____ round trips? Paver: 2000 SF or ____ round trips?**
1	Cement and Mortar Mixers	9	0.56	8	10	8	
2	Pavers	125	0.42	8	10	8	
2	Paving Equipment	130	0.36	8	8	6.4	
2	Rollers	80	0.38	8	8	6.4	
	Tractors/Loaders/Backhoes	97	0.37			0	
	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 horepower or load factor, as appropriate

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Typical Equipment Type & Load Factors

OFFROAD Equipment Type	HP	Load Factor
Aerial Lifts	62	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	205	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	162	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	174	0.41
Off-Highway Tractors	122	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	171	0.42
Other General Industrial Equipment	150	0.34
Other Material Handling Equipment	167	0.4
Pavers	125	0.42
Paving Equipment	130	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.2
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	255	0.4
Rubber Tired Loaders	199	0.36
Scrapers	361	0.48
Signal Boards	6	0.82
Skid Steer Loaders	64	0.37
Surfacing Equipment	253	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	80	0.5
Welders	46	0.45