APPENDIX A

Air Quality Impact Assessment

DRAFT

Air Quality Impact Assessment Report Dry Fermentation Anaerobic Digestion Facility

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Draft: December 2010

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DRAFT REPORT

AIR QUALITY IMPACT ASSESSMENT REPORT
DRY FERMENTATION ANAEROBIC DIGESTER PROJECT

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Draft: December 2010

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AIR QUALITY IMPACT ASSESSMENT REPORT
DRY FERMENTATION ANAEROBIC DIGESTER PROJECT

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1. SUMMARY

Zero Waste Energy, LLC proposes to construct the first waste-to-energy plant in the U.S. based on the dry fermentation approach to anaerobic digestion of the putrescible portion of municipal solid waste (MSW), to be located in San Jose, California. As the Lead Agency under the California Environmental Quality Act (CEQA), the City of San Jose is preparing a CEQA document that discusses all potential environmental impacts of the project—including air quality, public health, and climate change—and then issuing that document for public review and comment. This technical report analyzes those impacts based, respectively, on the project's emissions of criteria pollutants, toxic air contaminants, odor substances, and greenhouse gases (GHG), and concludes that the project air quality-related impacts will be less than significant.

The Dry-Fermentation Anaerobic Digestion (AD) Facility (Project) is proposed to be located at 2100 Los Esteros Road, north of Zanker Road and approximately 2 miles northwest of the intersection of Interstate 880 (Nimitz Freeway) and State Route 237 (Southbay Freeway) at the southern terminus of San Francisco Bay. The project site is approximately 41 acres, and is part of the buffer lands on the north side of the San Jose/Santa Clara Water Pollution Control Plant (WPCP). The site is part of an approximately 96-acre property adjacent to the Zanker Road Resource Recovery Operation and Landfill (ZRRROL) and the Zanker Material Processing Facility (ZMPF). Currently unused, the property contains a portion of the former Nine Par Landfill, a tidal marsh area, and the inactive WPCP recycled-water filling station.

The Project will accept 225,000 tons of putrescible waste per year, brought in to the facility at an average rate of 105 transfer trucks and 45 collection trucks per day. The putrescible waste, or feedstock, used in this process will consist mainly of food waste, source separated organics, and organic residue trucked directly to the proposed facility or conveyed from the nearby ZRRROL and/or ZMPF facilities. Biogas is harvested in "digesters," which are large airtight containers located within three enclosed main buildings. These digesters are filled with organic MSW feedstock and processed using anaerobic digestion. During this process, biogas is continuously generated and extracted from the digesters. After the digestion phase is complete (up to 28 days), the remaining material is removed from the digesters and placed into composting tunnels the same day, where a bulking agent such as woodchips is added. The woodchips and anaerobically treated feedstock are combined and processed using an aerobic composting procedure for up to 21 days. The material is then removed from the composting tunnels and transported outside for final curing (two to four weeks) and screening. In this final step the byproduct material becomes compost, which is sold as soil amendment. A small amount of residual material is left over from the curing and screening process, which may be reused as bulking material or properly discarded.

The nearest sensitive receptors are residences located approximately 0.82, 1.26, 1.23, and 1.74 miles west-southwest, south-southwest, south-southeast, and east-northeast of the project site, respectively.

The project will be developed in three phases. Each phase will be capable of handling 75,000 tons of organic waste material per year, for an eventual total of 225,000 tons of organic feedstock and 45,000 additional tons of bulking agent (i.e., 15,000 tons per phase per year) to be used in the AD process per year (i.e., total input materials = 270,000 tons per year).

Project construction will require importing approximately 100,000 cubic yards (CY) of soil during 36 days over six (6) weeks, (i.e., 2,778 cubic yards per day at 6 construction days per week and 99 truck trips per day [12 hours per day Monday through Friday, and 8 hours per Saturday]). Because the project will be constructed in three phases separated by approximately one year, and the initial construction of the project will be the most intense and extended in duration, the air quality impact analysis addresses the initial construction.

Biogas generated by the anaerobic digestion of the putrescible waste will power six[1] 832 horsepower onsite combined heat and power (CHP) engines driving electric power generators. Heat extracted from the hot combustion exhaust of each engine will be used to warm the anaerobic digestion process. A flare is included in each of the three phases as back-up to combust the biogas when insufficient engine capacity is available due to maintenance or other downtime of the engines.

In each phase, the enclosed main building—which houses the receiving, mixing, anaerobic digesting, and aerobic composting activities—will be equipped with an air circulation control system that regulates air flow within the structure, and exhausts air through one large biofilter to reduce toxic air contaminant emissions and control odors. Additionally, the facility will include a Diesel-fueled emergency generator and engine for each phase.

The Project will be subject to Bay Area Air Quality Management District (BAAQMD) rules and regulations, including the requirement for the CHP engines, backup flares and biofilters to have Best Available Control Technology (BACT). To comply with BACT requirements for the six CHP engines and to provide design features that avoid significant adverse air quality impacts, the project emitting units will be equipped with the air pollution control systems listed below.

- CHP engines:
    - Selective Catalytic Reduction (SCR) to reduce nitrogen oxides (NOx) emissions by at least 90%
    - Oxidation catalyst to reduce precursor organic compound (POC) emissions by at least 25%

[1] The six engines on average will receive an annual amount of biogas equivalent to running four of the engines at full load.

- Iron sponge filtering or equivalent technology to remove at least 80% reduced sulfur compounds (expressed as H_2S) from biogas

- Biofilters (3):
  - Baghouse control technology upstream of each biofilter to remove 99.25% of PM_{10} and $PM_{2.5}$ from the 50,300 acfm flowrate

- Fugitive dust: Watering to reduce fugitive dust during construction and the following routine operations:
  - Dumping and bulk handling of MSW organic portion and amendment materials as they are delivered to the three receiving halls
  - Screening of finished product at the outdoor stockpile
  - Loading of finished product on haul trucks delivering to markets

The maximum potential air quality impacts from the criteria pollutants emitted during project operation are shown in Table 1-1.

Table 1-1
Summary of Potential Criteria Pollutant Air Quality Impacts

Pollutant	Averaging Time	Maximum Facility Operation Impact ($\mu g/m^3$)	Representative Background Concentration ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour, NAAQS	[a]	[a]	158.0	-	188.7 [b]
	1-hour, CAAQS	[a]	[a]	225.6	339	-
	Annual	5.4	36.1	41.5	57	100
SO_2	1-hour	19.6	65.5	85.1	655	200 [c]
	3-hour	15.6	59.0	74.6	-	1,300
	24-hour	8.9	18.4	27.3	105	-
	Annual	2.4	2.7	5.1	-	80
CO	1-hour	1,318	4,945	6,263	23,000	40,000
	8-hour	559	3,456	4,015	10,000	10,000
PM_{10}	24-hour	1.8 [e]	**73.2**	**75.0**	50	150
	Annual[d]	0.33 [e]	**23.4**	**23.8**	20	-
$PM_{2.5}$	24-hour	1.2 [e]	**39**	**40.0**	-	35
	Annual[d]	**0.27** [e]	11.7	**12.0**	12	15.0

[a] Ambient background concentrations added to facility impact hour by hour.
[b] NAAQS is 100 ppbv, which converts to 188.7 $\mu g/m^3$ at 25ºC.
[c] NAAQS is 0.075 ppmv, which converts to 200.0 $\mu g/m^3$ at 25ºC.
[d] Annual Arithmetic Mean
[e] Does not exceed the PSD Significant Impact Level (SIL) even though the total is greater than the ambient air quality standard.

The maximum potential health impacts from the toxic air contaminants emitted during project operation are shown in Table 1-2. The maximum cancer risk is well below the 10 x 10^{-6} threshold of significance at the nearest residences and for offsite workers, based on emissions from project equipment meeting BACT for toxic air contaminants (T-BACT). The Project PMI is located at the northeast corner of the Project, where the land is owned by the San Jose/Santa Clara Water Pollution Control Plant. The significance threshold of 10 in one million is exceeded only within a small 7.6-acre area that extends approximately 330 feet north of the Project boundary, but remains on the former Nine Par Landfill site and on the southwest corner of the Zanker Landfill. Because there is no public access to this area, the public health impact of the Project is less than significant.

The maximum potential acute non-cancer health hazard index associated with short-term (i.e., 1-hour) concentrations in air falls below 1.0, the threshold of significance. Similarly, the maximum potential chronic non-cancer health hazard index associated with long-term (i.e., 1-year) concentrations in air also falls below 1.0, the threshold of significance.

The ground-level concentrations outside the Project boundary of odorous substances emitted by the CHP engines, flares, and biofilters will be less than odor detection thresholds, and therefore would be less than significant.

Table 1-2
Summary of Potential Health Impacts from Project Operation

Receptor	Carcinogenic Risk (per million)	Ambient $PM_{2.5}$ Concentration (annual average) ($\mu g/m^3$)	Acute Health Hazard Index	Chronic Health Hazard Index
Maximally Exposed Individual Resident (MEIR)	0.32	0.3	0.01	0.0007
Maximally Exposed Individual Worker (MEIW)	5.5		?	Not applicable [d]
BAAQMD CEQA Significance Level	10	0.3	1.0	1.0
Less than Significant?	Yes	Yes	Yes	Yes

GHG emissions from the Project would not cause a significant impact, as shown in Table 1-3.

Table 1-3 Potential Greenhouse Gas Impact					
Parameter	Units	Emission Rate			
		CO_2	CH_4	N_2O	SF_6
Facility Maximum Potential Annual Operation Emissions [a]	tpy	607	0.22	0.026	0.0011
	$MTCO_2e$/ year	552	4.2	7.4	24.4
Combined GHG Annual Emissions	$MTCO_2e$/ year	588			
BAAQMD CEQA Project (Facility) Annual Significance Threshold	$MTCO_2e$/ year	10,000			
Facility Annual Emissions Potentially Significant?	-	No			

[a] Excludes biogenic emissions from combustion of biogas in CHP engines and flares, following guidance in BAAQMD. "GHG Plan Level Quantification Guidance," April 15, 2010.

The Project would be in compliance with all federal, state, and BAAQMD rules and regulations.

###

2. INTRODUCTION

Zero Waste Energy, LLC proposes to construct the first waste-to-energy plant in the U.S. based on the dry fermentation approach to anaerobic digestion of the putrescible portion of municipal solid waste (MSW), to be located in San Jose, California. As the Lead Agency under the California Environmental Quality Act (CEQA), the City of San Jose is responsible for preparing a CEQA document[2] that discusses all potential environmental impacts of the project—including air quality, public health, and climate change—and then issuing that document for public review and comment. This technical report analyzes those impacts based, respectively, on the project's criteria pollutant, toxic air contaminant, odor substances, and greenhouse gas (GHG) emissions.

A description of the project is provided in Section 3, followed by a review of existing conditions in Section 4. Relevant significance criteria and thresholds are summarized in Section 5, and the project impacts and the level of significance are discussed in Sections 6 and 7. Possible mitigation measures are presented in Section 8. More detailed information is provided in a series of appendices.

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[2] An Initial Study must be prepared that indicates whether a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report is needed for the Project.

3. PROJECT DESCRIPTION

This project description focuses on the aspects of the project that affect potential emissions of regulated air pollutants and resulting air quality impacts. The Dry-Fermentation Anaerobic Digestion (AD) Facility (Project) is proposed to be located at 2100 Los Esteros Road, north of Zanker Road and approximately 2 miles northwest of the intersection of Interstate 880 (Nimitz Freeway) and State Route 237 (Southbay Freeway) at the southern terminus of San Francisco Bay (see Figure 1, provided at the end of this report). The project site is approximately 41 acres, and is part of the buffer lands on the north side of the San Jose/Santa Clara Water Pollution Control Plant (WPCP) (see Figure 2).

The project site is part of an approximately 96-acre property adjacent to the Zanker Road Resource Recovery Operation and Landfill (ZRRROL) and the Zanker Material Processing Facility (ZMPF) (see Figure 3). Currently unused, the property contains a portion of the former Nine Par Landfill, a tidal marsh area, and the inactive WPCP recycled-water filling station.

This area has been designated by the City of San Jose as a possible expansion area for the WPCP. As part of the proposed project, the owners of the WPCP (the City of San Jose and the City of Santa Clara) will execute a land lease with Zero Waste Energy Development Company, Inc. (Zero Waste), who will be responsible for developing, constructing, and operating the Project.

The nearest sensitive receptors are residences located approximately 0.82, 1.26, 1.23, and 1.74 miles west-southwest, south-southwest, south-southeast, and east-northeast of the project site, respectively (see Figures 4, 5, 6, and 7). The middle two groups of residences are within 100 and 500 feet of the south side of the Southbay Freeway (State Highway 237), and the fourth group of residences is within 100 feet of the east side of Nimitz Freeway (Interstate 880).

The proposed project is the construction and operation of the facility, which will utilize a proprietary technology to convert putrescible waste from the City of San Jose and surrounding communities into a biogas containing 50 to 60 percent methane. Putrescible waste (feedstock) used in this process will consist mainly of food waste, source separated organics, and organic residue from other MSW processing facilities.

Controlled anaerobic digestion of the feedstock in large airtight containers produces carbon dioxide and methane, which are captured to create biogas. This report analyzes the current proposal to use the biogas to power six onsite combined heat and power

(CHP) engines driving electric power generators.[3] Heat extracted from the hot combustion exhaust of each engine will be used to warm the anaerobic digestion process. A flare is included in each of the three phases as back-up to combust the biogas when insufficient engine capacity is available due to maintenance or other downtime of the engines.[4]

Biogas is harvested in "digesters," which are large airtight containers located within three enclosed main buildings. These digesters are filled with organic MSW feedstock and processed using anaerobic digestion. During this process, biogas is continuously generated and extracted from the digesters. After the digestion phase is complete (up to 28 days), the remaining material is removed from the digesters and placed into composting tunnels the same day, where a bulking agent such as woodchips is added. The woodchips and anaerobically treated feedstock are combined and processed using an aerobic composting procedure (up to 21 days). The material is then removed from the composting tunnels and transported outside for final curing and screening (two to four weeks). In this final step the byproduct material becomes compost, which is sold as soil amendment. A small amount of residual material is left over from the curing and screening process, which may be reused as bulking material or properly discarded.

The project will be developed in three phases. Each phase will be capable of handling 75,000 tons of organic waste material per year, for an eventual total of 225,000 tons of organic feedstock and 45,000 additional tons of bulking agent (i.e., 15,000 tons per phase per year) to be used in the AD process per year (i.e., total input materials = 270,000 tons per year). Each project phase will include one enclosed main building of approximately 60,000 square feet that will house the AD process for that phase. These buildings will be constructed of concrete with metal frame roofs and a maximum height of approximately 52 feet.

Each building will include an enclosed receiving area for organic feedstock and amendment material delivery and storage, a mixing hall, 16 digesters for the extraction of biogas, eight compost curing tunnels, and an engine control room. Biogas generated in the digesters in each main building will be stored in flexible bladders on the roof of the building before being piped to the two CHP engines. Each enclosed main building will be equipped with an air circulation control system that regulates air flow within the structure, and exhausts air through one large biofilter to reduce toxic air contaminant emissions and control odors. Additionally, the facility will include a Diesel-fueled emergency generator and engine, a maintenance shop, a separate administrative office building, and washroom facilities for employees. The separate administrative building will be wood-frame construction with cement-board siding, with a maximum height of 27 feet.

The AD facility will operate continuously 24 hours every day. The facility will be open to accept inbound materials and transport outbound materials from approximately

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[3] The six CHP engines are fueled with biogas at the annual average rate equivalent to four of the engines operating at full load.

[4] In a potential future development phase of the project, biogas may be cleaned and treated so that it can be permitted to fuel Clean Natural Gas vehicles. A supplemental CEQA document will be prepared to analyze the potential environmental impacts of such a scenario if it later becomes relevant.

8:00 AM to 6:00 PM every day. During initial operations (Phase I), the facility is expected to directly employ approximately 15 full-time employees. At full build-out (Phase III), the facility is expected to directly employ approximately 26 full-time employees.

Feedstock delivery entry from Los Esteros Road will be at the southeast corner of the proposed project site, sharing the access driveway to the adjacent ZRRROL property. A separate public, employee, and emergency fire entrance from Los Esteros Road will be located in the southwest corner of the facility. Visitor trips to and from the facility will average 10 per day. Non-waste materials such as janitorial and office supplies will be delivered to the facility by an average of 10 trucks per day. Regional access to the project area is provided via State Route 237 and Zanker Road.

The proposed facility will accept commercial and municipal organic waste, at an average rate of 105 transfer trucks and 45 collection trucks per day. Municipal feedstock materials are to be trucked directly to the proposed facility or conveyed from the nearby ZRRROL and/or ZMPF facilities. These trucks will first enter vehicle-weighing scales located at the adjacent ZRRROL facility before entering the AD Facility. An attendant at the scale house will inspect incoming trucks and direct them to the appropriate receiving location. Movement of feedstock within the facility will be accomplished with seven front-end loaders for material handling, mixing, loading, and unloading of haul trucks at an activity/emission level of 8 loader-hours per day.

Project construction will require importing approximately 100,000 cubic yards (CY) of soil during 36 days over six (6) weeks, (i.e., 2,778 cubic yards per day at 6 construction days per week and 99 truck trips per day [12 hours per day Monday through Friday, 7 AM to 7 PM, and 8 hours per Saturday, 9 AM to 5 PM]). Because the project will be constructed in three phases separated by approximately one year, and the initial construction of the project will be the most intense and extended in duration, the air quality impact analysis will be for the initial construction, including the following elements:

- Import of 100,000 CY of soil;
- Grading of the site to final grade;
- Placement of concrete foundation for the initial Phase I main process building with an area of 60,000 square feet;
- Placement of smaller concrete foundations for the two biogas-fueled CHP engine generators, single flare, two percolate tanks, biofilter, receiving area, and office building;
- Steelwork to construct main and office buildings; and
- Six vegetated swales and four drainage outfalls.

An Authority to Construct (ATC) permit from the Bay Area Air Quality Management District (BAAQMD) will be required to construct and operate each air pollutant emitting unit involved in facility operation, including six biogas combusting CHP engines, three backup flares, three biofilters, and three emergency generator engines.

To comply with BAAQMD BACT requirements for the six CHP engines and to provide design features that avoid significant adverse air quality impacts, the project emitting units will be equipped with the air pollution control systems listed below.

- CHP engines:
    - Selective Catalytic Reduction (SCR) to reduce nitrogen oxides (NOx) emissions by at least 90%
    - Oxidation catalyst to reduce precursor organic compound (POC)[5] emissions by at least 25%
    - Iron sponge filtering or equivalent technology to remove at least 80% reduced sulfur compounds (expressed as H_2S) from biogas

- Biofilters (3):
    - Baghouse control technology upstream of each biofilter to remove 99.25% of PM_{10} and $PM_{2.5}$ from the 50,300 acfm flowrate

- Fugitive dust: Watering to reduce fugitive dust during construction and in the following operation activities:
    - Dumping and bulk handling of MSW organic portion and amendment materials as they are delivered to the three receiving halls
    - Screening of finished product at the outdoor stockpile
    - Loading of finished product on haul trucks delivering to markets

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[5] Also equivalently referred to as reactive organic gases (ROG) and volatile organic compounds (VOC).

4. EXISTING CONDITIONS

The existing or background air quality conditions/setting is described in terms of the geography and topography of the site location; the prevailing local meteorology or climate in this area of the south end of San Francisco Bay; the current national and state ambient air quality standards; the last five years of air quality measured at the nearest monitoring stations; and the set of federal, state, and local district rules and regulations related to air quality.

4.1 Air Quality Setting

The air quality setting for the Project consists of the local geography and topography, which, combined with the long-term climate of the area, affects the existing ambient air quality to which Project emissions will be added.

4.1.1 Geography and Topography

The Project is proposed for development in the general wetland area at the southeast end of San Francisco Bay, as shown in Figure 1. The terrain is nearly level, and the site is at an elevation of approximately 10 feet above sea level.

The more general area containing the project site, the Santa Clara Valley, is bounded by the Santa Cruz Mountains on the west and the Diablo Mountain range on the east. The Valley between is characterized by flat expanses that have been ideal for the resulting urbanization of the cities of Santa Clara and San Jose.

4.1.2 Climate and Meteorology

The overall climate in this area of California is dominated by the semi-permanent eastern Pacific high-pressure system centered off the coast of California. This high is centered between the 140° west (W) and 150° W meridians, and oscillates in a north-south direction. Its position governs California's weather. In the summer, the high moves to its northernmost position, which results in strong northwesterly flow and negligible precipitation. A thermal low pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay area much of the summer. In the winter, the high moves southwestward toward Hawaii, which allows storms originating in the Gulf of Alaska to reach northern California, bringing wind and rain.

During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and the air pollution potential is low. During summer and fall, when the

Pacific high becomes dominant, inversions become strong and often are surface-based; winds are light and the pollution potential is high. These periods are often characterized by winds that flow out of the Central Valley into the Bay Area and often include morning and evening fog.

The predominant winds in California are depicted in Figures 8-11 for winter, spring, summer and fall, respectively. As shown in the figures, winds in California generally are light and easterly in the winter, but strong and westerly in the spring, summer, and fall.

Precipitation and temperature data have been recorded at the meteorological monitoring station located in Santa Clara, approximately 5 miles south of the project site. About 81% of the region's annual rainfall of approximately 15 inches occurs between November and March.[6] In summer (June, July, and August), daily high and low temperatures in the project area average 80.8 degrees Fahrenheit (°F) and 55.3°F, respectively. In winter (December, January, and February), daily high and low temperatures are about 59.5°F and 41.9°F, respectively.[6]

The main air quality-related problem in this mild Mediterranean climate is the frequent presence of a temperature inversion over the Santa Clara Valley that traps air pollution below. Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the topography of the air basin, and local meteorological conditions. In the project area, stable atmospheric conditions and light winds can provide conditions for pollutants to accumulate in the air basin when emissions are produced.

Wind patterns in the general area of the project site can be seen in Figures 12-16, which show annual wind roses for meteorological data collected at the San Jose International Airport weather station between 2005 and 2009. It can be seen that the winds are closely aligned with the orientation of Santa Clara Valley (i.e., primarily from the north-northwest, and northwest).

The mixing heights in the area are affected by the eastern Pacific high pressure system and marine influences. Often, the base of the inversion is found at the top of a layer of marine air, because of the cooler nature of the marine environment. At Oakland International Airport (the nearest upper-level meteorological station, located approximately 18 miles northwest of the project site), 50th percentile morning mixing heights for the period 1979–80 were on the order of 1770 feet (530 to 550 meters) in summer and fall, and 3600 to 3900 feet (1100 to 1200 meters) in winter and spring.[7] The 50th percentile afternoon mixing heights ranged from 2150 and 3030 feet (660 to 925 meters) in summer and fall, and over 3900 feet (over 1200 meters) in winter and spring. Such mixing heights provide generally favorable conditions for the dispersion of pollutants. Inland areas, where the marine influence is weaker, often experience strong ground-based inversions during cold weather periods. These inversions inhibit dispersion of low-lying sources of air pollution, such as cars, trucks and buses, and can result in high pollutant concentrations.

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[6] Desert Research Institute, Western Regional Climate Center. 2008. Western U.S. Climate Historical Summaries, Site Accessed January 2009. URL: http://www.wrcc.dri.edu/Climsum.html

[7] Smith, T.B., W.D. Sanders, and D.M. Takeuchi. Application of Climatological Analysis to Minimize Air Pollution Impacts in California, Final Report on ARB Agreement A2-119-32. August 1984.

4.1.3 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter (with aerodynamic diameter less than or equal to a nominal 10 micrometers, PM_{10}), fine particulate matter (with aerodynamic diameter less than or equal to a nominal 2.5 micrometers, $PM_{2.5}$), and airborne lead. Areas with air pollution levels above these standards can be designated by the EPA as "nonattainment areas" subject to stringent planning and pollution control requirements.

Similarly, the California Air Resources Board (CARB) has established California ambient air quality standards (CAAQS) for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, $PM_{2.5}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops, and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant can occur during exposures to a high concentration for a short time (1, 3, 8, or 24 hours), or to a relatively lower average concentration over a longer period (1 month or 1 year), or both. For some pollutants there are at least two air quality standards to address health effects found for both short-term and long-term periods. Table 4-1 presents the NAAQS and California ambient air quality standards. The California standards are generally set at concentrations lower than the federal standards and in some cases have shorter averaging periods (i.e., more difficult to attain).

4.1.4 Existing Air Quality

Data from several ambient air monitoring stations were used to characterize air quality in the area of the project site. For each pollutant, the station closest to the project site with the most complete data for that pollutant was selected. In general, the selected stations record area-wide ambient conditions rather than the localized impacts of any particular facility. All ambient air quality data presented in this section were taken from CARB publications and data sources or EPA air quality data tables. Ozone, NO_2, CO, PM_{10}, and $PM_{2.5}$ were monitored at the San Jose-Jackson Street station, located about 6.5 miles from the project site. SO_2 was monitored at San Francisco-Arkansas Street station (about 33 miles from the project site), and lead was monitored at the Whitney Young Circle station in San Francisco (about 31 miles from the project site). Table 4-2 summarizes the most recent four years of available ambient monitoring data to characterize existing air quality in the project area.

Table 4-1 Ambient Air Quality Standards			
Pollutant	Averaging Time	California	National
Ozone	1 hour	0.09 ppm (180 μg/m^3)[a,b]	-
	8 hours	0.070 ppm (137 μg/m^3)[a]	0.075 ppm [c] (147 μg/m^3)
Carbon Monoxide	8 hours	9.0 ppm (10 mg/m^3)[a]	9 ppm (10 mg/m^3)[d]
	1 hour	20 ppm (23 mg/m^3)[a]	35 ppm (40 mg/m^3)[d]
Nitrogen Dioxide	Annual Average	0.030 ppm (57 μg/m^3)[a]	0.053 ppm (100 μg/m^3)
	1 hour	0.18 ppm (339 μg/m^3)[a]	0.100 ppm [e] (3-year average of 98th percentile of yearly 1-hour daily maximum concentrations)
Sulfur Dioxide	Annual Average	-	0.030 ppm (80 μg/m^3) proposed to be revoked [f]
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3) proposed to be revoked [g]
	3 hours	-	0.5 ppm (1300 μg/m^3)[h]
	1 hour	0.25 ppm (655 μg/m^3)	0.075 ppm[i] (3-year average of 99th percentile of yearly 1-hour daily maximum concentrations)
Suspended Particulate Matter (10 Micron)	Annual Arithmetic Mean	20 μg/m^3	-
	24 hours	50 μg/m^3	150 μg/m^3
Suspended Particulate Matter (2.5 Micron)	Annual Arithmetic Mean	12 μg/m^3	15.0 μg/m^3 (3-year average)
	24 hours	-	35 μg/m^3 (3-year average of 98th percentiles)
Sulfates	24 hours	25 μg/m^3	-
Lead	30 days	1.5 μg/m^3	-
	Calendar Quarter	-	1.5 μg/m^3
	Rolling 3-Month Average		0.15 μg/m^3
Hydrogen Sulfide	1-hour	0.03 ppm	-
Vinyl Chloride	24-hour	0.01 ppm	-
Visibility Reducing Particles	8-hour (10am to 6pm PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.	-

ppm = parts per million
μg/m^3= micrograms per cubic meter

a. Not to be exceeded.
b. Equivalent concentrations are based on 25ºC and 760 torr (mm Hg).
c. 3-year average of annual 4th-highest. 73FR16435, March 27, 2008.
d. Not to be exceeded more than once a year.
e. Equivalent to 188.7 μg/m^3 at a conversion temperature of 25ºC, but not stated in the federal rule (Federal Register, Volume 75, Number 26, Part III, Environmental Protection Agency, 40 CFR Parts 50 and 58, *Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule,* February 9, 2010.
f. EPA proposed rule, Federal Register, Volume 74, Number 234, pp. 64809-64881, December 8, 2009, and based on 3-year average of annual 99th percentile (4th highest) 1-hour daily maximum concentration.
g. EPA. *Primary National Ambient Air Quality Standard for Sulfur Dioxide, Final Rule,* June 2, 2010, http://www.epa.gov/air/sulfurdioxide/pdfs/20100602final.pdf.
h. This is a national secondary standard, which is designed to protect public welfare.
i. Equivalent to 200 μg/m^3 at a conversion temperature of 25ºC, but not stated in the federal rule (Federal Register, Volume 75, Number 119, Environmental Protection Agency, 40 CFR Parts 50, 53 and 58, *Primary National Ambient Air Quality Standards for Sulfur Dioxide; Final Rule,* June 22, 2010.

Table 4-2 Background Air Quality Data							
Pollutant	Parameter	2005	2006	2007	2008	2009	Applicable Air Quality Standard
Ozone	Highest 1-hr Average (ppm)	0.113	0.118	0.083	0.118	0.088	0.09 (state)
	# of days exceeding state standard	1	5	0	1	0	--
	# of days exceeding federal standard	0	0	0	0	0	--
	Highest 8-hr Average (ppm)	0.08	0.087	0.068	0.08	0.069	0.070 (state) 0.075 (federal)
	# of days exceeding state standard	1	5	0	3	0	--
	# of days exceeding federal standard	1	3	0	2	0	--
Nitrogen Dioxide	Highest 1-hr Average (ppm)	0.074	0.074	0.065	0.08	0.069	0.100 (federal)
	Highest Annual Average (ppm)	0.019	0.018	0.017	0.017	0.015	0.030 (state)
Carbon Monoxide	Highest 1-hr Average (ppm)	4.3	4.1	3.5	3.3	3.4	20 (state) 35 (federal)
	Highest 8-hr Average (ppm)	3.11	2.92	2.71	2.48	2.5	9.0 (state) 9 (federal)
Sulfur Dioxide	Highest 1-hr Average (ppm)	0.019	0.025	0.016	0.021	[a]	0.25 (state)
	Highest 24-hr Average (ppm)	0.007	0.007	0.006	0.004	[a]	0.04 (state) 0.14 (federal)
	Annual Average (ppm)	0.001	0.001	0.001	0.001	[a]	0.030 (federal)
PM_{10}	24-hr Average ($\mu g/m^3$)	53.5	73.2	69.1	57.3	43.3	50 (state)
		49.9	68.9	64.7	55.0	41.1	150 (federal)
	# of days exceeding CAAQS or NAAQS	11.5	11.5	18.1	6.1	0	--
		0	0	0	0	0	--
	Annual Average ($\mu g/m^3$)	22.3	21	21.9	23.4	20.3	20 (state)
$PM_{2.5}$	24-hr Average ($\mu g/m^3$)	39.8	36	39.1	32.4	29.8	35 (federal) (3-year average of 98th percentiles)
	Annual Average ($\mu g/m^3$)	11.7	[a]	11	11.5	10.1	12 (state)
		11.7	10.7	10.7	11.5	10.1	15 (federal)
Lead	Quarterly Average ($\mu g/m^3$)	0	n/a	n/a	n/a	n/a	1.5 (federal)

[a] There were insufficient (or no) data available to determine the value.

4.1.4.1 Ozone

Ozone is generated by complex reactions between POC and NOx in the presence of ultraviolet radiation. POC and NOx emissions from vehicles and stationary sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature

inversion, and intense sunlight, result in high ozone concentrations during the summer months. Based upon ambient air measurements at stations throughout the area, the San Francisco Bay Area Air Basin is classified as a nonattainment area for both state and federal ozone standards. Maximum ozone concentrations at the San Jose-Jackson Street station are usually recorded during the spring and fall. The data in Table 4-2 show that the federal and state 8-hour air quality standards and the state 1-hour air quality standard were exceeded in 2005, 2006, and 2008.

4.1.4.2 Nitrogen Dioxide

Nitrogen dioxide is formed primarily from reactions in the atmosphere between nitric oxide (NO) and oxygen or ozone. Nitric oxide is formed during high-temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is less harmful than NO_2, it is converted to NO_2 in the atmosphere within a matter of hours, or even minutes under certain conditions. For purposes of state and federal air quality planning, the San Francisco Bay Area Air Basin is in attainment for NO_2. The data in Table 4-2 show that there have been no violations of either the new federal one-hour standard (0.100 ppm) or the state annual average standard (0.030 ppm) during the four years.

4.1.4.3 Carbon Monoxide

Carbon monoxide (CO) is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors. Industrial sources generally contribute less than 10% of ambient CO levels. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and stagnant weather conditions. For purposes of state and federal air quality planning, the San Francisco Bay Area Air Basin is classified as being in attainment for CO. The data in Table 4-2 show that the maximum 1-hour and 8-hour average concentrations in the project area are well below the California and federal air quality standards.

4.1.4.4 Sulfur Dioxide

Sulfur dioxide (SO_2) is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. The amount of sulfur in various fuels varies considerably. Natural gas contains a negligible amount of sulfur; digester gas contains a small amount, while bunker fuel used in large ships contains much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The San Francisco Bay Area Air Basin is considered to be in attainment for SO_2 for purposes of state and federal air quality planning. The data in Table 4-2 show that maximum 1-hour, 24-hour, and annual average SO_2 concentrations are well below the applicable standards.

4.1.4.5 Respirable and Fine Particulates (PM_{10} and $PM_{2.5}$)

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and NOx, respectively. In 1984, CARB adopted standards for respirable particulates and phased out the total suspended particulate (TSP) standards that had been in effect until then. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of respirable particulates related to human health. In 1987, EPA also replaced national TSP standards with PM_{10} standards. For air quality planning purposes, the San Francisco Bay Area Air Basin is considered to be in nonattainment of both state PM_{10} standards, the federal 24-hour $PM_{2.5}$ standard, and the state annual $PM_{2.5}$ standard, but in attainment of the federal 24-hour PM_{10} and annual $PM_{2.5}$ standards.

Table 4-2 shows the federal and state air quality standards for PM_{10}, maximum levels, and arithmetic annual averages recorded at the San Jose-Jackson Street station during the past four years. Maximum 24-hour PM_{10} levels occasionally exceed the state standard, but are consistently lower than the federal standard based on 99th percentile concentrations. The annual average PM_{10} levels persistently exceed the state standard.

For $PM_{2.5}$, the highest 24-hour three-year average 98th percentile reading slightly exceeded the federal standard (35 $\mu g/m^3$) during 2005-2007; the annual $PM_{2.5}$ levels have not exceeded the state standard (12 $\mu g/m^3$).

4.1.4.6 Airborne Lead

Lead in the air results from the combustion of fuels that contain lead. Thirty years ago, motor vehicle gasoline contained relatively large amounts of lead compounds used as octane-rating improvers, and ambient lead levels were relatively high. Beginning with the 1975 model year, manufacturers began equipping new automobiles with exhaust catalysts, which were poisoned by the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and leaded gasoline began to be phased out. As a result, ambient lead levels decreased dramatically, and for many years the San Francisco Bay Area Air Basin has been in attainment of state airborne lead levels for air quality planning purposes.

As shown in Table 4-2, maximum quarterly lead levels in San Jose are well below the federal standard. CARB no longer includes lead in its summary of historical air quality.

4.1.4.7 Toxic Air Contaminants

CARB monitors 10 important toxic air contaminants (TAC) in a network of 17 monitoring stations located throughout the state, of which 3 are located in the Bay Area. The annual average concentration of each TAC is published[8] along with its associated

[8] California Air Resources Board, 2009. CARB Almanac 2009, Chapter 5 – Toxic Air Contaminant Emissions, Air Quality, and Health Risk, http://www.arb.ca.gov/aqd/almanac/almanac09/pdf/chap509.pdf.

cancer risk for each year from 1990 through 2007. The results for the years 2005 through 2007 are presented in Table 4-3 along with the associated cancer risks.

Table 4-3
San Francisco Bay Area Air Basin Toxic Air Contaminant Annual Average Concentrations and Cancer Risks

Toxic Air Contaminant[a]	Parameter	Units	2005	2006	2007
Acetaldehyde	Annual average[b]	ppbv	0.7	0.66	0.56
	Cancer risk	E-06[c]	3	3	3
Benzene	Annual average	ppbv	0.314	0.326	0.274
	Cancer risk	E-06	29	30	25
1,3-Butadiene	Annual average	ppbv	0.075	0.069	0.06
	Cancer risk	E-06	28	26	23
Chromium, hexavalent	Annual average	nanogram/m^3	0.08	0.063	0.053
	Cancer risk	E-06	12	9	8
Para-dichlorobenzene	Annual average	ppbv	0.15	0.15	-
	Cancer risk	E-06	10	10	-
Formaldehyde	Annual average	ppbv	1.32	1.59	1.45
	Cancer risk	E-06	10	12	11
Methylene chloride	Annual average	ppbv	0.13	0.16	0.13
	Cancer risk	E-06	<1	<1	<1
Perchloroethylene	Annual average	ppbv	0.029	0.027	0.031
	Cancer risk	E-06	1	1	1
Total	Cancer risk	E-06	93	91	71
Diesel Particulate Matter (DPM)	Annual average	µg/m^3	1.6[d]		
	Cancer risk (with DPM)	E-06	480 (2000)[e]		

Source: CARB. The California Almanac of Emissions and Air Quality – 2009 Edition, http://www.arb.ca.gov/aqd/almanac/almanac09/almanac09.htm.
[a] Carbon tetrachloride was not measured at the Bay Area monitoring stations after 2003.
[b] Arithmetic mean.
[c] in-one-million
[d] Estimate for the year 2000 based on receptor modeling rather than monitoring.
[e] Derived from the receptor-modeled concentration.

4.1.4.8 Greenhouse Gases

The global average concentration of the three most prevalent greenhouse gases is as follows:

1. Carbon dioxide (CO_2): 389.5 ppmv at the end of the 1st quarter 2010;[9]
2. Methane (CH_4): 1.76 ppm[10] in 2004; and
3. Nitrous oxide (N_2O): 319 ppt[11] in 2003.

Global, U.S., California, and Santa Clara County existing GHG emissions are shown in Table 4-4, and provide reference points for comparison to the Project GHG emissions calculated in Section 6.2.3. The emissions of each GHG are multiplied by its respective global warming potential (CO_2 Equivalency Factor) to obtain the emissions on the common basis of millions of metric tons per year of carbon dioxide equivalent.

[9] National Oceanic and Atmospheric Administration (NOAA), Earth System Research Laboratory, Global Monitoring Division, Trends in Atmospheric Carbon Dioxide, Mauna Loa, April 2010, http://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/co2_trend_mlo.pdf.
[10] Methane Matters, http://www.worldclimatereport.com/index.php/2007/04/13/methane-matters/
[11] Pidwirny, M.. The Greenhouse Effect. Fundamentals of Physical Geography, 2nd Edition. 2006, http://www.physicalgeography.net/fundamentals/7h.html.

Table 4-4 Existing Greenhouse Gas Emissions						
Parameter	Units[b]	CO_2	CH_4	N_2O	SF_6	Total GHG
CO_2 Equivalency Factor Used to Calculate GHG Emissions[a]	-	1	21	310	23,900	-
Santa Clara County[c]	MMtpy CO_2e	20	1.9	1.1	0.05	23
California Emissions (2004)[d]	MMtpy CO_2e	409	39	22	1.1	480
U.S. Emissions (2008)[e]	MMtpy CO_2e	5,921	568	318	16	6,957
Global Emissions (2000)[f]	MMtpy CO_2e	31,868	6,020	3,114	46.77	41,049

[a] California Air Resources Board. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, December 2, 2008, http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm. Global warming potential is a measure of the GHG warming properties and lifetime in the atmosphere relative to CO_2.

[b] Units are standardized millions of metric tons per year carbon dioxide equivalent, equal to the product of each GHG emission in metric tons and the CO_2 equivalency factor divided by one million.

[c] Proportioned from California state GHG inventory of 479.74 million metric tons CO2e in 2004 by proportion of state population in July 2008 (36,756,666) in Santa Clara County in July 2008 (1,764,499). U.S. Census Bureau, Population Division, last updated May 7, 2010, Google, http://www.google.com/publicdata?ds=uspopulation&met=population&idim=county:06085&dl=en&hl=en&q=population+of+santa+clara+county.

[d] Total GHG from California Climate Change Portal, Greenhouse Gas Emissions Inventory, http://www.climatechange.ca.gov/inventory/index.html, total anthropogenic emissions without subtracting forest absorption of CO_2. Four component gas estimates proportioned from U.S. emissions by ratio of total GHG.

[e] EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008, Report EPA 430-R-10-006, http://epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_Report.pdf.

[f] EPA. Global Anthropogenic Non-CO_2 Greenhouse Gas Emissions: 1990-2020, EPA Report 430-R-06-003, June 2006 Revised, http://www.epa.gov/climatechange/economics/downloads/GlobalAnthroEmissionsReport.pdf.

4.2 Public Health Setting

The background cancer risk in the general Bay Area was approximately 480 in one million (see Table 4-3) in the year 2000, based on CARB's monitoring of the listed TACs. Of that total cancer risk, approximately 81% was attributed to Diesel exhaust. Cancer risk varies over a large range depending on whether a residence is located near to or far from a major roadway.[12] Sensitive receptors include locations where groups of individuals—including infants, children, the elderly, and the chronically ill—who may be more susceptible than the general population to health risks from air pollution may be found. Schools, day-care facilities, convalescent homes, and hospitals are of particular concern. The nearest sensitive receptors in the following categories were identified, and are listed in Appendix A, Tables A-1 through A-5, respectively:

[12] CARB. Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, http://www.arb.ca.gov/ch/handbook.pdf.

- Pre-schools/day-care centers;
- Schools (K-12);
- Elder care facilities/convalescent homes;
- Residences/homes[13]; and
- Hospitals/medical clinics/urgent care centers.

The nearest residence to the Project is approximately 0.73 miles to the west-southwest (see Figure 4).

4.3 Regulatory Setting

The Project is subject to laws, ordinances, regulations, rules and standards at the federal, state, and local levels. These requirements will be separated by the three different governmental levels, and by those that apply to air quality and public health as distinct from the newly emerging set that apply to greenhouse gases and climate change.

4.3.1 Air Quality and Public Health

EPA has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental laws. California is under the jurisdiction of EPA Region 9, which has its offices in San Francisco. Region 9 is responsible for the local administration of EPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific trust territories. EPA's activities relative to the California air pollution control program focus principally on reviewing California's submittals for its State Implementation Plan (SIP). The SIP is required by the federal Clean Air Act to demonstrate how all areas of the state will meet the national ambient air quality standards within the federally specified deadlines.[14]

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources. Because of their respective authorities, the agencies listed in Table 4-5 are Commenting or Responsible Agencies with respect to CEQA. EPA and the BAAQMD are also permitting agencies. An application for an Authority to Construct Permit for the Project will be filed with the BAAQMD.

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[13] Sensitive individuals include "children, the elderly, and those with pre-existing serious health problems affected by air quality," and sensitive sites include "schools and schoolyards, parks and playgrounds, day care centers, nursing homes, hospitals, and residential communities." (Ibid). According to CARB's "Notice of Public Hearing to Consider Amendments to the Hexavalent Chromium Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations," August 1, 2006: "In particular, a definition is being proposed to define 'sensitive receptor.' As proposed, a 'sensitive receptor' would be defined as: 'any residence including private homes, condominiums, apartments, and living quarters; education resources such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. A sensitive receptor includes long term care hospitals, hospices, prisons, and dormitories or similar live-in housing.' "

[14] 42 USC §7409, 7411.

Table 4-5 Project-Regulating Air Quality Agencies		
Agency	**Authority**	**Contact**
U.S. EPA Region 9	Oversight of permit issuance, enforcement	Gerardo Rios, Chief, Permits Office U.S. EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1259
California Air Resources Board	Regulatory oversight	Mike Tollstrup, Chief Project Assessment Branch California Air Resources Board 2020 L Street Sacramento, CA 95814 (916) 322-6026
Bay Area Air Quality Management District	CEQA Responsible Agency, Permit issuance, enforcement	Brian Bateman, Director of Permit Services Bay Area Air Quality Management District 939 Ellis Street San Francisco, CA 94109 (415) 749-4653

4.3.1.1 Federal

Prevention of Significant Deterioration (PSD) Program
Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52
Requirements: Requires PSD review and facility permitting for construction of new or modified major stationary sources of air pollution. Major is defined as having annual potential emissions of an attainment criteria pollutant greater than 250 tons per year, or 100 tons per year for 28 specified source categories (40 CFR 52.21), which do not include this project. PSD review applies with respect to attainment pollutants for which ambient concentrations are lower than the corresponding national ambient air quality standards (NAAQS). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (i.e., specified national parks and wilderness areas).

The following federal PSD requirements apply on a pollutant-by-pollutant basis, depending on facility emission rates:

- Emissions must be controlled using Best Available Control Technology (BACT);
- Air quality impacts in combination with other increment-consuming sources must not exceed maximum allowable incremental increases for SO_2, PM_{10}, $PM_{2.5}$, and NOx;
- Air quality impacts of the proposed facility, other proposed new sources in the area plus ambient pollutant background levels cannot exceed the NAAQS;
- Pre- and/or post-construction air quality monitoring may be required; and

- The air quality impacts on soils, vegetation, and nearby PSD Class I areas must be evaluated. (Note: The Project is located in a Class II area.)

PSD review jurisdiction is delegated to the BAAQMD. PSD permits for Bay Area sources are not issued by the EPA.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

New Source Review
Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52
Requirement: Requires New Source Review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies with respect to nonattainment pollutants for which ambient concentration levels are higher than the corresponding NAAQS. The following federal requirements apply on a pollutant-by-pollutant basis, depending on facility emission rates:

- Emissions must be controlled to the Lowest Achievable Emission Rate (LAER);
- Sufficient offsetting emissions reductions must be obtained following the requirements in the regulations to continue reasonable further progress toward attainment of applicable NAAQS;
- The owner or operator of the new facility must affirm that major stationary sources owned or operated by the same entity in California are in compliance or on schedule for compliance with all applicable emissions limitations;
- The administrator must find that the implementation plan has been adequately implemented; and
- An analysis of alternatives must show that the benefits of the proposed source significantly outweigh any environmental and social costs.

NSR jurisdiction has been delegated to the BAAQMD for all pollutants and is discussed further under local regulatory setting and conformance below.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

Acid Rain Program
Authority: Clean Air Act §401 (Title IV), 42 USC §7651; 40 CFR Parts 72-78
Requirement: Requires the reduction of the adverse effects of acid deposition through reductions in emissions of sulfur dioxide and nitrogen oxides. Applicable to utility units burning a fossil fuel and generating electricity which is sold (40 CFR Section 72.2). BAAQMD has received delegation authority to implement Title IV.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

Title V Operating Permits Program
Authority: Clean Air Act §501 (Title V), 42 USC §7661; 40 CFR Part 70
Requirements: Establishes comprehensive operating permit program for major stationary sources. BAAQMD has received delegation authority for this program.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

National Standards of Performance for New Stationary Sources
Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60
Requirements: Establishes national standards of performance, called new source performance standards (NSPS), for new stationary sources. These standards are enforced at the local level with EPA oversight. Relevant new stationary source performance standards are discussed under local LORS below.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

National Emission Standards for Hazardous Air Pollutants
Authority: Clean Air Act §112, 42 USC §7412; 40 CFR Part 61
Requirements: Establishes national emission standards for hazardous air pollutants (NESHAPS). These standards are enforced at the local level with EPA oversight and are further discussed under local regulatory setting and conformance below.
The NESHAPS[15,16] codified in 40 CFR Part 63 Subpart ZZZZ establishes emission limitations and operating requirements for existing, new, and reconstructed spark ignition and compression ignition reciprocating internal combustion engines at both major and area sources of hazardous air pollutants.
Administering Agency: BAAQMD, with EPA Region 9 oversight.

4.3.1.2 State

The California Air Resources Board was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update as necessary the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the NAAQS (California Health & Safety Code [H&SC] §39500 et seq.).

Nuisance Regulation
Authority: CA H&SC §41700
Requirements: Provides that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."
Administering Agency: BAAQMD and CARB

Toxic "Hot Spots" Act
Authority: H&SC §44300-44384; 17 CCR §93300-93347

[15] Major source of HAPs has the potential to emit at least 10 tpy of a single HAP or at least 25 tpy of a combination of HAPs. An area source emits lower levels of HAPs than these limits.
[16] Federal Register, Volume 75, No. 41, pp. 9648-9690, March 3, 2010.

Requirements: Requires preparation and biennial updating of inventory of facility emissions of toxic air contaminants listed by CARB, in accordance with its regulatory guidelines. Risk assessments are to be prepared by facilities required to submit emissions inventories according to local priorities.
Administering Agency: BAAQMD and CARB

GHG Mandatory Reporting Program Regulation
Authority: CA H&SC §38500 et seq; 17 CCR §95100-95133
Requirements: The "reporting and verification of greenhouse gas emissions from specified greenhouse gas emissions sources." For most industrial sectors, the reporting threshold is 25,000 metric tons of CO_2. For a general stationary combustion facility having operational control of a cogeneration system, such as use of a combined heat and power engine, GHG emissions for the previous year (e.g., 2010) must be reported by April 1 of the following year (e.g., 2011).
Administering Agency: CARB

Air Toxics Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
Authority: 17 CCR §2485
Requirements: Limits idling "the vehicle's primary diesel engine for greater than 5.0 minutes at any location," excluding defined exceptions.
Administering Agency: CARB

Air Toxics Control Measure for Stationary Compression Ignition Engines
Authority: 17 CCR §93115
Requirements: Limits particulate matter emissions to 0.15 g/bhp-hr for new emergency standard engines, and aligns the other criteria pollutant emission limits with the corresponding NSPS Subpart IIII (see BAAQMD Regulation 10 below).
Administering Agency: BAAQMD and CARB

4.3.1.3 Local

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, were established by the Legislature for several regions in California, including the San Francisco Bay Area (H&SC §40200 et seq.).

Air pollution control districts and air quality management districts in California have several principal responsibilities:

- Developing plans for meeting the state and federal ambient air quality standards;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and

- Enforcing air pollution statutes and regulations governing non-vehicular sources and developing employer-based trip reduction programs.

District Regulations and Policies
Authority: CA H&SC §40001
Requirements: Prohibits emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.
Administering Agency: BAAQMD, with CARB oversight.

BAAQMD Regulation 1 – General Provisions and Definitions
Purpose: Regulation 1 provides the following:

- Administrative requirements (e.g., violation notices);
- Fundamental definitions that apply to all rules (e.g., facility vs. source);
- Public nuisance standards;
- An explicit prohibition against circumvention of District's rules;
- Clarification that District rules apply to the ambient atmosphere, not the workroom or other indoor atmosphere;
- Exclusions of applicability of/exemptions from the rules; and
- Responsibilities upon the breakdown of control equipment.

Because facilities that engage in anaerobic digestion and aerobic composting are potential sources of odor, and odor is considered to be a public nuisance, Rule 1-301, prohibiting public nuisance, is potentially applicable:

> *No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30 day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.*

BAAQMD Regulation 2 – Permits, Rule 1 - General Requirements
Requirements: Rule 1 provides a list of specific equipment that is exempted from the requirement of having a permit to operate, including surface preparation and cleaning equipment. The rule has a more specific set of definitions than found in Regulation 1, including the following:

- Complete application;
- Fugitive emissions;
- Major Facility;
- Startup period;
- CEQA;
- EIR;

- Federally enforceable;
- Hazardous air pollutant;
- Toxic air contaminant; and
- Health risk screening analysis.

The Project will be required to obtain an Authority to Construct (ATC) permit before beginning construction, whose issuance will require evidence of having a certified CEQA EIR or other CEQA document. Upon successful inspection by the BAAQMD at the completion of construction, and after starting up the Project's emitting sources (e.g., receipt of organic waste for the digesters and startup of the biogas-fueled CHP engines), a Permit to Operate (PTO) will be issued by the District.

Section 2-1-203 – Fugitive Emissions. This rule is applicable to "those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening." Therefore, emissions generated by handling of the product in the outside curing piles and final product stockpile are fugitive, while emissions generated by similar handling of organic waste, anaerobically digested waste, and compost material inside the facility buildings and emanating from the biofilters are not fugitive.

Section 2-1-204 – Major Facility. Defines a Major Facility as follows:

- Subsection 204.1 – Major Facility (Regulated Air Pollutants). "A facility that has the potential to emit 100 tons per year or more of any regulated air pollutant except total suspended particulate."

- Subsection 204.2 – Major Facility (Hazardous Air Pollutants). "A facility that has the potential to emit 10 tons per year or more of a single hazardous air pollutant, 25 tons per year or more of a combination of hazardous air pollutants, or such lesser quantity as the EPA Administrator may establish by rule."

Section 2-1-221 – Source. Defines a source as "Any article, machine, equipment, operation, contrivance, or related groupings of such which may produce and/or emit air pollutants."

Section 2-1-301 – Authority to Construct. Establishes the requirement to obtain an Authority to Construct (ATC) permit before construction begins on a project containing air emission sources.

Section 2-1-302 – Permit to Operate. Establishes the requirement to obtain a Permit to Operate (PTO) after an initial start-up period not to exceed 180 days after completion of construction and commencing operation under an ATC permit.

Section 2-1-310 – Applicability of CEQA. Requires CEQA review and certification to obtain an ATC permit.

BAAQMD Regulation 2 – Permits, Rule 2 – New Source Review
Requirements: Rule 2 describes the primary process for reviewing the Project to assure its compliance with key requirements:

- BACT, applicable to criteria pollutants;
- BACT for Toxics (T-BACT), applicable to toxic air contaminants;
- Emission offsets, needed if the facility qualifies as major; and
- Prevention of Significant Deterioration (PSD) requirements, needed if the facility qualifies as major for one or more regulated pollutants.

BACT Requirement (Section 2-2-301). Requires application of BACT to any source (i.e., emitting unit) that potentially could emit 10.0 or more pounds per day of POC, non-precursor organic compounds (NPOC), NOx, SO_2, PM_{10}, or CO.

Offset Requirements, Precursor Organic Compounds and Nitrogen Oxides, NSR (Section 2-2-302). Requires that for new or modified sources emitting in excess of 50 tons per year of POCs or NOx, the total project emissions must be offset (i.e., an emission reduction comparable to the emission increase attributable to the source must be achieved at the project site or at another location). To assure that there is no net increase in regional emissions as a result of new or modified sources, offsets at a ratio of 1.15 to 1.0 must be provided. For facilities emitting more than 15 but less than 50 tons per year of POCs or NOx, offsets are provided by the District from the Small Facility Banking account at a ratio of 1.0 to 1.0 unless ERCs are owned by the developer.

Offset Requirement, PM_{10} and Sulfur Dioxide, NSR (Section 2-2-303). Requires offsets of PM_{10} or SO_2 emissions if the potential emission rate of either is 1.0 ton per year or more on a pollutant-specific basis at a Major Facility (100 tons per year on a pollutant specific basis).

BAAQMD Regulation 2 – Permits, Rule 5 – New Source Review of Toxic Air Contaminants
Requirements: Rule 5 provides low-emission exemption limits, definitions oriented to toxic air contaminants and public health impacts, T-BACT requirements, health risk screening analysis procedures, designation of priority communities of greatest concern for public health impacts, and administrative requirements.

T-BACT is defined similarly to BACT, except for the emission of toxic air contaminants instead of criteria pollutants, including "the most stringent emission limitation achieved by an emission control device." T-BACT must be applied to each source (i.e., emitting unit) where the source may potentially cause a cancer rusk greater than 1.0 in one million or a chronic health hazard index greater than 0.20. The overall potential public health impact of the total facility must not exceed a cancer risk of 10.0 in one million, a chronic health hazard index of 1.0, or an acute health hazard index of 1.0.

A health risk screening analysis (HRSA) is required if any weighted annual average emission rate of a listed TAC exceeds its chronic trigger level in Table 2-5-1.

BAAQMD Regulation 3 – Fees
Requirements: Regulation 3 establishes the fee structure for permit applications, modifications, changes in conditions, transfers, risk screening, hearing board applications, emissions, indirect source review, and other District activities.

BAAQMD Regulation 7 – Odorous Substances
Requirements: Regulation 7 stipulates limitations only if and after the District receives complaints from 10 or more complainants within a 90-day period alleging objectionable odors within the property line of each complainant. Quantitative limits on discharge concentrations are set for dimethyl sulfide, ammonia, mercaptans as methyl mercaptan, phenolic compounds as phenol, and trimethylamine.

BAAQMD Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
Requirements: Rule 9-8 sets NOx and CO emission limits for stationary internal combustion engines (ICEs) rated more than 50 brake horsepower (bhp) as follows:

- Spark-ignition engines
  - NOx (as NO_2) $\leq$ 70 ppmvd[17] @ 15% oxygen (O_2)
  - CO $\leq$ 2,000 ppmvd @ 15% O_2

- Compression-ignition engines rated more than 175 bhp
  - NOx (as NO_2) $\leq$110 ppmvd @ 15% O_2
  - CO $\leq$ 310 ppmvd @ 15% O_2

BAAQMD Regulation 10 – Standards of Performance for New Stationary Sources
Requirements: Regulation 10 adopts the federal new source performance standards (NSPS) published in 40 CFR Part 60.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission limits for manufacturers (same for operators) of model year 2007 and later emergency stationary compression ignition (CI) internal combustion engines (ICEs) over the entire life of the engine. Also requires that the engine fuel meet the requirements of 40 CFR 80.510(b) for non-road Diesel fuel, and that each engine be equipped with a non-resettable hour meter before initial startup. If the engine is equipped with a Diesel particulate filter (DPF), then the DPF must also have a back-pressure monitor that notifies the engine owner when the high back pressure limit is approached.

Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. Establishes emission limits for manufacturers (same for operators) of spark ignition (SI) ICEs including lean-burn engines after January 1, 2008, with a maximum engine power $\geq$ 500 hp and < 1,350 hp. The emission limits for a lean-burn SI ICE fueled with landfill or digester gas, rated between 500 and 1,350 hp, and manufactured between January 1, 2008, and July 1, 2010, are listed below.

- NOx (as NO_2): 220 ppmvd @ 15% O_2 or 3.0 g/hp-hr
- CO: 610 ppmvd @ 15% O_2 or 5.0 g/hp-hr
- VOC: 80 ppmvd @ 15% O_2 or 1.0 g/hp-hr

[17]parts per million by volume on a dry basis.

For the same engine manufactured after July 1, 2010, the NOx limit is lowered as follows:

- NOx (as NO_2), 150 ppmvd @ 15% O_2 or 2.0 g/hp-hr

4.3.2 Greenhouse Gases and Climate Change Regulatory Setting

4.3.2.1 Federal

On October 30, 2009, the U.S. EPA released the Final Rule for the Mandatory Reporting of Greenhouse Gases (GHG).[18] The rule became effective on December 29, 2009. Facilities subject to the rule needed to begin data collection for calendar year 2010 on January 1, 2010; the initial reports are due on March 31, 2011. The federal threshold for reporting is 25,000 metric tons of CO_2 -equivalent emissions, which includes contributions of the following other five GHG: methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

On May 13, 2010, EPA issued the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule that sets thresholds for GHG emissions defining when permits under the Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the emission thresholds for the current Title V and PSD permitting programs to limit the number of facilities that will be required to obtain PSD and Title V permits as a result of their GHG emissions. Currently, biogenic GHG emissions are not exempted from the applicability threshold, but EPA is considering excluding these emissions in a future rulemaking. Under this rule, EPA will phase in higher PSD and Title V permitting program emission thresholds for GHGs in two initial steps as follows:

Step 1 (January 2, 2011, to June 30, 2011)

- Only sources subject to the current PSD permitting program (i.e., new or modified sources with significant increases of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD.
- For these projects, only GHG increases of 75,000 tpy or more of total GHG, on a CO_2e basis, would need to determine BACT for their GHG emissions.
- Similarly for Title V, only sources currently subject to the program (i.e., new or existing sources that are major for a pollutant other than GHGs) would be subject to Title V requirements for GHG.

Step 2 (July 1, 2011, to June 30, 2013)

- PSD permitting requirements will apply to new sources that emit GHG emissions of at least 100,000 tpy CO_2e, and modifications that increase GHG emissions by at least 75,000 tpy CO_2e even if they do not exceed the permitting thresholds for any other pollutant.

[18] The regulation is codified at 40 CFR 98.

- Facilities that emit at least 100,000 tpy CO_2e will be subject to Title V permitting requirements even if they would not otherwise be subject to Title V based on emissions of any other pollutant.

4.3.2.2 State

On September 27, 2006, the California Global Warming Solutions Act (Assembly Bill 32, or AB 32) became law, which called for reducing statewide greenhouse gas (GHG) emissions to 1990 levels by 2020. CARB is tasked with implementing the legislation and, as required by the statute, has adopted a Scoping Plan to set the blueprint for how a myriad of sources of GHGs, including the transportation sector (40% of state emissions), the industrial sector, the agriculture and forestry sector, and others can all contribute GHG reductions. AB 32 requires a combination of measures to reduce overall emissions in the State while still accommodating future population and economic growth in California.

CARB was also tasked with developing and implementing a mandatory reporting rule for major sources of emissions of the six greenhouse gases. The December 2008 CARB Regulation for the Mandatory Reporting of Greenhouse Gas Emissions became effective in January 2009. The first reports on calendar year 2008 GHG emissions required by the rule were due on either April 1, 2009, or June 1, 2009, depending on the facility's source category. The reporting threshold is 25,000 metric tons of CO_2 only, specifically excluding other GHG pollutants to calculate applicability. CARB has proposed in its revised Mandatory Reporting Rule that the threshold be reduced to 10,000 metric tons of CO_2-equivalent emissions. This proposed rule is scheduled to go before the agency's Board for approval on December 16, 2010.

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5. SIGNIFICANCE CRITERIA

5.1 Introduction

Criteria have been established to determine if the potential environmental impacts of a proposed project are potentially significant, and would therefore require mitigation in an attempt to reduce the potential impacts to a less-than-significant level. The criteria are accompanied by quantitative thresholds to allow a clear determination of potential significance. Because of different approaches to analysis, the significance criteria and thresholds are separated into three categories to address (1) criteria pollutants relative to emission limits and ambient air quality standards, (2) toxic air contaminants relative to public health impacts, and (3) greenhouse gases relative to global climate change.

5.2 Criteria Air Pollutants, Emission Limits, and Ambient Air Quality Standards

The BAAQMD has published[19] facility-wide average daily and maximum annual pollutant emission thresholds of significance for four criteria pollutants, as listed below.

- NOx, $PM_{2.5}$ and POC: 54 lbs/day and 10 tpy
- PM_{10}: 82 lbs/day and 15 tpy

In addition, EPA has adopted the significant impact levels (SILs) listed in Table 5-1. Air quality impacts for criteria pollutants are determined by adding the maximum project impacts to background ambient concentrations for each pollutant and averaging time, and comparing the sum against the corresponding ambient air quality standards. If the existing background ambient air quality level of any of the criteria pollutants already exceeds an ambient air quality standard, then the maximum ground-level concentration generated by the facility cannot exceed the SILs shown in Table 5-1.

[19] BAAQMD. "California Environmental Quality Act (CEQA) Air Quality Guidelines", June 10, 2010.

Table 5-1 Ambient Air Quality Significant Impact Levels (SILs)[a]		
Pollutant	Averaging Time	SILs ($\mu g/m^3$)
PM_{10}	24-hour Annual	5 1
$PM_{2.5}$	24-hour Annual	1.2[b] 0.3 [b]
NO_2	Annual	1
SO_2	3-hour 24-Hour Annual	25 5 1
CO	1-hour 8-hour	2000 500

[a] From EPA PSD and Nonattainment New Source Review regulations (40 CFR 52.21) and 40 CFR 51.165(b)(2).

[b] Significant Impact Levels for Class II areas, EPA. "Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)--Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC)," Federal Register, Volume 75, Number 202, pages 64863-64907, October 20, 2010.

5.3 Toxic Air Contaminants and Health Impacts

Significance criteria exist for both carcinogenic and non-carcinogenic risks, and for annual average ambient $PM_{2.5}$ concentrations. Each of these is discussed separately below.

5.3.1 Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are assumed to have no threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no threshold model). Under state and BAAQMD regulations, an incremental cancer risk greater than 10 in one million due to a project is considered to be a significant impact on public health if the emitting units are determined by the BAAQMD to be using Toxics Best Available Control Technology (T-BACT).[20] The 10-in-one-million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

[20] The threshold would be 1 in one million if the emitting units were determined not to be applying T-BACT.

BAAQMD CEQA Air Quality Guidelines define cumulative cancer risk to include that of the Project plus all local stationary sources and high-volume roadways within 1,000 feet beyond the project boundary, and is limited to 100 in one million. The only local stationary source within 1,000 feet of the project boundary is the San Jose/Santa Clara Water Pollution Control Plant (WPCP), as seen in Figures 1 and 2.

5.3.2 Non-Cancer Risk

Non-cancer health effects can be either long-term (chronic) or short-term (acute). In determining potential non-cancer health risks from air toxics, it is assumed there is a dose of the toxic air contaminant below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). A non-cancer health risk is measured in terms of a health hazard quotient, which is the calculated maximum exposure (concentration) of each toxic air contaminant divided by its REL. Health hazard quotients for toxic air contaminants affecting the same target organ are summed, with the resulting totals expressed as health hazard indices for each organ system. A health hazard index of less than 1.0 is considered to be a less-than-significant health risk.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chronic chemical accumulation to toxic levels occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The chronic REL for a non-carcinogenic air toxic is set at the lowest exposure level at which there is no chronic effect. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic health hazard index was calculated as the sum of the chronic health hazard quotients for the individual chemicals having chronic RELs.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most toxic air contaminants, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all acute health hazard quotients are summed to calculate the acute health hazard index. The maximum one-hour average concentration of each toxic air contaminant with acute health effects is divided by the TAC's acute REL to obtain a health hazard index for health effects caused by relatively high, short-term exposure to air toxics. An additional conservative procedure in this health risk assessment is that the health hazard quotients for all toxic air contaminants having potential acute impacts were summed regardless of target organ. This method leads to an upper-bound assessment. RELs used in the hazard index calculations were those published in the CARB/OEHHA listings dated April 25, 2005.

Four compounds also have 8-hour health effects, and associated 8-hour RELs for which health hazard quotients are calculated by dividing the maximum 8-hour average concentration of each toxic air contaminant by the TAC's 8-hour REL. The four 8-hour quotients were added to obtain the 8-hour health hazard index. The BAAQMD has not set a CEQA threshold of significance for 8-hour health impacts nor does the District

require that the screening health risk assessment include analysis of the 8-hour health hazard.

Cumulative health impact, as defined in the BAAQMD CEQA Air Quality Guidelines, is limited to a chronic health hazard index of 10.0 from the Project plus all other local sources within 1,000 feet of the Project boundary. For this project, the WPCP, Zanker Landfill, and Zanker Materials Processing Facility (MPF) are the only qualifying local sources.

Because of concern about the health effects of fine particulate, the BAAQMD has supplemented the protection offered by California and national ambient air quality standards for $PM_{2.5}$. The BAAQMD has established a CEQA threshold of significance of 0.3 $\mu g/m^3$ for a project, which, if exceeded, would be determined to "be a significant cumulatively considerable contribution."[21] For cumulative air quality impact analysis, the BAAQMD set the threshold of significance at 0.8 $\mu g/m^3$ for a project plus all local sources within 1,000 feet of the Project boundary. Again, the WPCP, landfill and MPF are the only qualifying local sources.

5.4 Greenhouse Gases and Global Climate Change

The State Office of Planning and Research (OPR) issued specific wording that amended 14 sections of the current CEQA guidelines.[22] The new language added two significance criteria in a new GHG Section VII, as follows:

Would the project:

a). *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*
b). *Conflict with an applicable plan policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases*?

The BAAQMD has established 10,000 metric tons of CO_2e as the CEQA threshold of significance for GHG emissions from a stationary source project. The contributing emissions exclude biogenic sources,[23] such as the combustion of biogas, digester gas, and landfill gas.

Table 5-2 summarizes the BAAQMD CEQA air quality thresholds of significance.

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[21] BAAQMD. "CEQA Air Quality Guidelines," page 5-4, June 2010.
[22] California Governor's Office of Planning and Research. "CEQA Guidelines and Greenhouse Gases." http://opr.ca.gov/index.php?a=ceqa/index.html.
[23] BAAQMD. "GHG Plan Level Quantification Guidance," p. 2, April 5, 2010. "Biogenic CO_2 emissions result from materials that are derived from living cells, as opposed to CO_2 emissions derived from fossil fuels, limestone and other materials that have been transformed by geological processes. Biogenic CO_2 contains carbon that is present in organic materials that include, but are not limited to, wood, paper, vegetable oils, animal fat, and food, animal and yard waste. Biogenic CO emissions should be excluded from the GHG inventory because these emissions are the result of materials in biological/physical carbon cycle, rather than the geological carbon cycle."

Table 5-2 BAAQMD Adopted Air Quality CEQA Thresholds of Significance			
	Construction	Operation	
	Average Daily Emissions	Average Daily Emissions	Maximum Annual Emissions
Pollutant	(lb/day)	(lb/day)	(tpy)
ROG	54	54	10
NOx	54	54	10
PM_{10}	82 (exhaust only)	82	15
$PM_{2.5}$	54 (exhaust only)	54	10
PM_{10}/PM2.5 (fugitive dust)	Best Management Practices	None	
GHG Stationary Sources	None	10,000 metric tons CO_2e	
Risks and Hazards - New Source	Same as operation	MEI > 10.0 in a million Chronic or Acute Hazard Index > 1.0 Ambient $PM_{2.5}$ increase > 0.3 Φg/m^3 annual average Zone of Influence - 1,000-foot radius from fence line of source.	
Risks and Hazards - New Source (cumulative)	Same as operation	MEI > 100 in a million Chronic Hazard Index > 10.0 Ambient $PM_{2.5}$ increase > 0.8 Φg/m^3 annual average (all local sources) Zone of Influence - 1,000-foot radius from fence line of source.	

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6. PROJECT IMPACTS

This section presents the analysis of the project's potential impacts, beginning with an overview of the analytical approach, followed by a description of the criteria pollutant, toxic air contaminant, and GHG emissions generated by operation of the project, and their impacts. Emissions and impacts related to project construction are also reviewed, as well as cumulative air quality impacts from this and other projects.

6.1 Overview of the Analytical Approach to Estimating Facility Impacts

The following sections describe the emission sources that have been evaluated, the results of the ambient impact analyses, and the evaluation of project compliance with the applicable air quality and GHG regulations. As described below, based on an analysis that uses an extremely conservative set of assumptions and procedures—i.e., maximum allowable emission rates; a project operating schedule that leads to maximum emissions; worst-case meteorological conditions; and adding the worst-observed existing air quality to the highest potential ground-level impact computed from air dispersion modeling—the impacts of the proposed project are found to be less than significant.

6.2 Operational Emissions Assessment

The emissions sources at full build-out of the facility include the following emitting units associated with each of the three equivalent phases of the project:

- One combined heat and power (CHP) system per project phase, consisting of two lean-burn reciprocating internal combustion engines that operate continuously and burn biogas generated by the anaerobic digestion of the organic portion of municipal solid waste;

- One fully enclosed ground-based flare per project phase, burning the same biogas continuously when the CHP systems are down for maintenance for an assumed five days per year;

- One biofilter per project phase, treating the waste air from the set of aerobic composting tunnels in each main building and the exhaust from two front-end loaders in Phase 1 and one front-end loader in each of Phases 2 and 3, used to move the organic waste and amendment materials within each phase's main building; and

- One Diesel-fueled emergency generator engine per project phase.

The basic design parameters and values for the CHP engines burning biogas are summarized in Table 6-1. Additional details for these engines and other emitting units are provided in Appendix B.

Table 6-1
Combined Heat and Power Biogas-Fueled
Reciprocating Internal Combustion Engine Specifications

Manufacturer	MWM
Model	TCG2016 V12 C
Fuel	Biogas
Maximum Heat Input Rate	5.50 MMBtu/hr @ HHV
Maximum Power Generation	600 ekW
Maximum Brake Horsepower	831 bhp
Stack Exhaust Temperature	903°F
Exhaust Flow Rate	4,206 acfm
Annual Operation	8,640 hours (5 days downtime)
Emission Controls	Selective Catalytic Reduction (90%); Oxidation catalyst (25% reduction of POC); and Iron sponge or other 80% effective fuel sulfur (as H_2S) removal system.

The biogas generated by the anaerobic digestion process is expected to have the nominal composition shown in Table 6-2.

The biogas is treated by an "iron sponge" or equivalent control system to reduce the sulfur content by at least 80% as required by BAAQMD BACT guidance.[24] The CHP engines will require occasional servicing, during which time the biogas (which is continually generated) will be routed to ground-level, fully enclosed flares as specified in Table 6-3.

[24]BAAQMD BACT Guideline 96.5.2, Revision 2, May 14, 2009 (see Appendix C).

Table 6-2 Biogas Nominal Fuel Properties			
Component Analysis		Chemical Analysis	
Component	Average Concentration, Volume	Constituent	Percent by Weight
Methane (CH_4)	60 %	C	44.4 %
Carbon Dioxide (CO_2)	30.4 %	O	39.76 %
Water H_2O	4 %	H	9.95 %
Nitrogen (N_2)	5 %	N	5.73%
Hydrogen (H_2)	0.5 %		
Hydrogen sulfide (H_2S)	0.12 %	S	0.16 %
		Higher Heating Value (HHV)	606 Btu/scf [a] 9,138 Btu/lb

[a] Standard cubic feet (scf) are based on conditions of 14.696 psia and 70°F as specified in BAAQMD Rule 1-228.

Table 6-3 Ground-Level Fully Enclosed Flare Specifications	
Manufacturer	Flare Industries, Inc. or equivalent
Model	FEF-18 or equivalent
Fuel	Biogas
Maximum Heat Input/Rated Capacity	10.9/18.0 MMBtu/hr @ HHV
Stack Exhaust Temperature	1,400/1,500°F
Exhaust Flow Rate, actual maximum	8,345 acfm
Exhaust Stack Diameter	6 feet
Exhaust Stack Height	40 feet
Annual Operation	5 days maximum

The biofilters will treat the off-gas from the composting tunnels, exhaust from the loaders operating inside the main building of each project phase, and fugitive dust generated by bulk material handling inside each main building. Basic design characteristics of the biofilters are presented in Table 6-4, and specifications for the front-end loaders are shown in Table 6-5.

Table 6-4 Biofilter Design Specifications	
Manufacturer	To be determined
Model	To be determined
Treated Waste Streams	Composting off-gas, loader exhaust and fugitive dust
Exhaust Temperature	70-100°F
Exhaust Flow Rate	50,300 acfm
Exhaust Lateral Dimensions	140 feet by 90 feet
Exhaust Stack Height	10.66 feet
Annual Operation	8,760 hours continuous
Exhaust Ammonia Level, maximum	20 ppbv
Exhaust Reduced Organic Sulfur, maximum	15 ppbv

Table 6-5 Front-End Loader Reciprocating Internal Combustion Engine Specifications	
Manufacturer	Caterpillar or equivalent
Model and Engine	950H, powered by C7 ATAAC engine or equivalent
Fuel	Diesel No. 2
Average Fuel Consumption Rate	2.7 gallons per hour
Maximum Brake Horsepower	216 bhp
Daily Operation	8 hours per day
Emission Controls	Tier 3 engine design

Bulk material handling will generate fugitive dust emissions within each of the three main buildings. MSW organic material, at the rate of 75,000 tpy, and 15,000 tpy of amendment material will be deposited on the floor in the receiving hall. Outside the main buildings, fugitive dust will be generated by screening the finished compost product by electric motor-driven trammel screens and loading the finished product into trucks that transport it to markets. During the curing period when the composted product is piled outdoors in curing piles, some VOCs and ammonia are emitted. Appendix B contains the calculations of these fugitive dust, VOC, and ammonia emissions.

Each of the three phases will be equipped with a Diesel-fueled emergency generator engine having the design characteristics shown in Table 6-6.

Table 6-6 Diesel-Fueled Emergency Generator Engine Specifications	
Manufacturer	Caterpillar or equivalent
Model	C32 ATAAC or equivalent
Fuel	Diesel fuel No. 2
Maximum Fuel Consumption Rate	72.0 gallons per hour
Maximum Power Generation	1,000 ekW
Maximum Brake Horsepower	1,341 bhp
Stack Exhaust Temperature	893.3°F
Exhaust Flow Rate	8,129 acfm
Annual Operation, testing	26 hours (0.5 hour per week)
Emission Controls	EPA Tier 2 and California ATCM compliant (4.93 g/bhp-hr NOx, 0.13 g/bhp-hr CO, 0.01 g/bhp-hr VOC, 0.018 g/bhp-hr PM_{10} @ 15% O_2)

Toxic air contaminants will also be emitted by the units discussed above. Emissions of all criteria pollutants, TACs, and GHG are characterized and quantified in Sections 6.2.1, 6.2.2, and 6.2.3, respectively.

6.2.1 Criteria Pollutant Emissions

The CHP engine, flare, biofilter and emergency generator engine emission rates have been estimated from vendor data, project design criteria, and established emission calculation procedures. The emission rates for each of these emitting units are shown in Tables 6-7 through 6-12. In addition, POC emissions from the outdoor curing piles and PM_{10} emissions from screening the finished product and loading it on trucks are estimated.

The maximum emissions from each CHP engine are based on the engine specifications shown in Table 6-1 and the nominal composition properties of the biogas shown in Table 6-2. Because the biogas is considered more similar to digester gas than landfill gas, the appropriate digester gas BACT guidance is provided from BAAQMD BACT Guideline 96.5.2. After treating the biogas to 80% sulfur (as H_2S) based on removal with iron sponge or other appropriate fuel treatment technology, the engine satisfies BACT for all criteria pollutants (see Table 6-7 and Appendix C).

Table 6-7 Maximum Criteria Pollutant Emission Factors and Rates[a] for Each Combined Heat and Power (CHP) Engine[b]				
Pollutant	g/bhp-hr	ppmvd @ 11.55% O_2	lb/MMBtu (HHV)	lb/hr
NOx [c]	0.095	28	0.032	0.17
CO	1.14	551	0.38	2.09
POC [d]	0.29	160	0.073	0.53
PM_{10}/ $PM_{2.5}$[e]	0.018	-	0.006	0.033
SO_2[f]	0.197	42	0.066	0.36

[a] Satisfies BAAQMD BACT Guideline 96.5.2, Revision 2, May 14, 2009 (see Appendix C).
[b] Emission rates shown reflect the highest value at any operating load.
[c] After 90% from Selective Catalytic Reduction.
[d] As methane.
[e] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.
[f] Based on biogas maximum fuel sulfur content of 240 ppmv, which remains after 80% control of initial 1,200 ppmv.

The maximum emissions from each flare shown in Table 6-8 are based on the flare specifications shown in Table 6-3 and the nominal composition properties of the biogas shown in Table 6-2. The flare specifications and emission factors comply with BAAQMD BACT Guideline 80.1 by satisfying the following requirements:

- Ground-level and fully enclosed design;
- Retention time >0.6 seconds at a temperature >1400ºF;
- Automatic combustion air control;
- Automatic shutoff gas valve;
- Automatic re-start system;
- Scrubbing and/or carbon adsorption for hydrogen sulfide removal of at least 80% to satisfy BAAQMD BACT Guideline 96.5.2 discussed above; and
- NOx emission factor < 0.06 lbs/MMBtu, as shown in Table 6-8.

The maximum emissions from the biofilters shown in Tables 6-9 (for Biofilter 1) and 6-10 (for Biofilter 2 or 3) are based on the biofilter design specifications shown in Table 6-4, front-end loader emissions shown in Table 6-11, and fugitive dust emissions calculated in Appendix B.

Table 6-8 Maximum Criteria Pollutant Emission Factors and Rates for Each Ground-Level Fully Enclosed Flare			
Pollutant	ppmvd @ 3% O_2	lb/MMBtu (HHV)	lb/hr
NOx	45	0.06	0.66
CO	57	0.046	0.50
POC	20	0.049	0.52
PM_{10}/ $PM_{2.5}$[a]	-	0.015	0.16
SO_2[b]	36	0.066	0.72

[a] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.
[b] Based on maximum fuel sulfur content of 13.9 grain S/100 scf biogas.

Table 6-9 Maximum Criteria Pollutant Emission Concentrations and Rates for the Phase 1 Biofilter 1		
Pollutant	ppmvd	lb/hr
NOx	1.7	0.61
CO	6.8	1.5
POC	1.1	0.14
PM_{10}/ $PM_{2.5}$[a]	-	0.00064
SO_2	0.0015	0.00076

[a] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.

Table 6-10 Maximum Criteria Pollutant Emission Concentrations and Rates for Each of the Phase 2 and Phase 3 Biofilters		
Pollutant	ppmvd	lb/hr
NOx	1.1	0.41
CO	3.6	0.79
POC	1.0	0.13
PM_{10}/ $PM_{2.5}$[a]	-	0.00030
SO_2	0.00088	0.00044

[a] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.

Table 6-11 Maximum Criteria Pollutant Emission Factors and Rates for the Diesel-Fueled Front-End Loader Engine		
Pollutant	g/bhp-hr	lb/hr
NOx	0.75	0.20
CO	2.6	0.69
POC	0.12	0.032
PM_{10}/ $PM_{2.5}$[a]	0.15	0.040
SOx (as SO_2)	0.0012	0.00032

[a] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.

Emission factors and rates for the Diesel-fueled emergency standby generator engines are shown in Table 6-12. Each of these three engines will be tested for 30 minutes each week during a different hour so as to reduce the maximum potential one-hour impacts.

Table 6-12 Maximum Criteria Pollutant Emission Factors and Rates for the Diesel-Fueled Emergency Generator Engine		
Pollutant	g/bhp-hr	lb/hr
NOx	4.93	7.3
CO	0.13	0.19
POC	0.01	0.015
PM_{10}/ $PM_{2.5}$[a]	0.018	0.027
SOx (as SO_2)	0.0026	0.0077

[a] 100 percent of particulate matter emissions assumed to be emitted as $PM_{2.5}$; PM_{10} emissions include both front and back half as those terms are used in EPA Method 5.

The maximum firing rates and daily and annual fuel consumption rates define the allowable operations that determine the maximum potential hourly, daily, and annual emissions for each pollutant. The maximum heat input rates (fuel consumption rates) for the biogas-fueled engines, and flares are shown in Table 6-13.

Table 6-13 Maximum Facility Biogas Fuel Use, MMBtu (HHV)			
Period	Biogas-Fueled CHP Engines (each)	Flares (each)	Maximum Total Fuel Use (all Units)
Per Hour	5.5	11.0	33.0 [a]
Per Day [b]	132	264	792 [a]
Per Year	47,510[c]	1,320[d]	48,830

[a] Based on 3 flares.
[b] Based on 24 hours per day of firing.
[c] Maximum fuel use based on 8,640 hours (360 days) per year of firing, per engine.
[d] Based on 120 hours (5 days) of operation per year.

The analysis of maximum facility emissions of each criteria pollutant was based on the engine, flare, biofilter, front-end loader, and emergency generator engine emission factors shown in Tables 6-7 through 6-12. In addition, outdoor POC emissions from curing piles and PM_{10} emissions from screening and loading the finished product outdoors are included. The maximum hourly, daily and annual emissions of each criteria pollutant for the Project are shown in Table 6-14, and are based on the operating conditions and scenario parameters outlined below.

Maximum Hourly Emissions:

- For NOx, CO, SOx, and POC – Four of the six engines operate at maximum biogas flow rate for one hour, with one Diesel-fueled emergency generator engine being tested for one-half hour.

- For $PM_{10}/PM_{2.5}$ and SOx (i.e., the maximum SOx emission rate is the same for combustion in the four of the six engines or three flares because the biogas fuel flow rate is the same) – All three flares operate at maximum biogas flow rate for one hour, with one Diesel-fueled emergency generator engine being tested for one-half hour.

- For all pollutants, the four front-end loaders in the main buildings are operating with their emissions routed through a baghouse and biofilter.

Maximum Daily Emissions:

- For NOx, CO, SOx, and POC – Four of the six engines operate at maximum biogas flow rate for 24 hours, with one Diesel-fueled emergency generator engine being tested for one-half hour.

- For $PM_{10}/PM_{2.5}$ and SOx – All three flares operate at maximum biogas flow rate for 24 hours, with one Diesel-fueled emergency generator engine being tested for one-half hour.

- For all pollutants, the front-end loaders operate for 8 hours during the 10-hours (8 AM to 6 PM) when the facility is open to incoming waste and outgoing product with their emissions routed through the biofilters.

Table 6-14
Maximum Facility Criteria Pollutant Emissions[a]

Parameter	NOx	POC	PM_{10}/ $PM_{2.5}$	SOx (as SO_2)	CO
Maximum Hourly Emissions, lb/hr					
Engines, with SCR (4) [b] or	0.70	1.60	0.13	1.44	8.37
Flares (3,1)	0.66	0.52	0.16	0.72	0.50
Biofilter 1 (1)	0.61	0.13	0.00064	0.00076	1.5
Biofilters 2 + 3 (2)	0.82	0.26	0.00060	0.00088	1.6
Diesel Emergency Generator Engine (3,1)	7.3	0.015	0.027	0.0077	0.19
Outdoor Curing Piles and Truck Idling (15)	0.23	0.15	0.0039	0.00013	0.10
Outdoor Loaders and Other Truck Travel and Idling	0.73	0.12	0.073	0.0010	1.1
Screening and Loading Finished Product (3)	-	-	0.014	-	-
Total Project Maximum, pounds per hour[c,d]	10.7	2.3	0.35	1.5	12.8
Maximum Daily Emissions, lb/day					
Engines, with SCR (4) or	16.7	38.3	3.2	34.6	201
Flares (3,1)	15.8	12.4	3.9	17.3	12.0
Biofilter 1 (1)	5.3	2.7	0.0048	0.0063	12.0
Biofilters 2 + 3 (2)	7.4	5.3	0.0055	0.0075	13.0
Diesel Emergency Generator Engine (3,1)	7.3	0.015	0.027	0.0077	0.19
Outdoor Curing Piles and Truck Idling (15)	2.3	3.1	0.039	0.0013	1.03
Outdoor Loaders and Other Truck Travel and Idling	10.1	1.7	1.3	0.015	20.4
Screening and Loading Finished Product (3)	-	-	0.11	-	-
Total Project Average, pounds per day[c,d,e]	43.1	51.1	4.7	34.7	246.6
Total Project Maximum, pounds per day[c,d,e]	56.7	51.1	7.0	34.7	247.4
Maximum Annual Emissions, tpy					
Engines, with SCR (4) or	3.0	6.9	0.57	6.2	36.1
Flares (3,3)	0.12	0.093	0.029	0.13	0.090
Biofilter 1 (1)	0.97	0.49	0.00088	0.0012	2.2
Biofilters 2 + 3 (2)	1.36	0.97	0.0010	0.0014	2.4
Diesel Emergency Generator Engine (3,3)	0.28	0.00058	0.0010	0.00030	0.0075
Outdoor Curing Piles and Truck Idling (15)	0.42	0.57	0.0071	0.00024	0.19
Outdoor Loaders and Other Truck Travel and Idling	1.84	0.30	0.23	0.0027	3.7
Screening and Loading Finished Product (3)	-	-	0.020-	-	-
Total Project Maximum, tons per year[c]	8.0	9.3	0.86	6.4	44.7

[a] See Appendix B, Table B-12 for detailed calculations.
[b] The first number in parentheses after each source type gives the total number of emitting units in the facility, and the second is the number that operate during the same hour, day, or year (i.e., each of the three Diesel Emergency Generator Engines is tested at a different time and each of the three flares backs up two of the six CHP engines during different scheduled maintenance periods).
[c] Totals may not be exact because of rounding.
[d] Totals are not the sum of all the listed emission rates because all the engines and flares do not run during the same maximum emissions hour and day.
[e] Note that average daily emissions, not maximum daily emissions, are compared to BAAQMD CEQA emission thresholds of significance.

Maximum Annual Emissions:

- For NOx, CO, SOx, $PM_{10}/PM_{2.5}$, and POC:
  - The equivalent of four of the six CHP engines operate at the maximum biogas flow rate for 8,640 hours; all three flares operate at the maximum biogas flow rate for 120 hours; and the three Diesel-fueled emergency generator engines are tested for 26 hours annually (i.e., 0.5 hour weekly).
  - The front-end loaders are operated 8 hours during each 10-hour day with their emissions routed through the biofilters.

The maximum facility emission levels in Table 6-14 are compared with the BAAQMD CEQA daily and annual thresholds of significance in Tables 6-15 and 6-16, respectively.

Table 6-15
Comparison of Facility Average Daily Emissions Increase with BAAQMD CEQA Daily Thresholds of Significance[a]

Pollutant	Emissions[b] (pounds per day)	Significant Emission Levels (pounds per day)	Significant?
NOx	43.1	54	No
POC	51.1	54	No
PM_{10} (exhaust)	4.7	82	No
$PM_{2.5}$ (exhaust)	4.6	54	No

[a] BAAQMD. "Adopted Air Quality CEQA Thresholds of Significance," June 2, 2010.
[b] Detailed calculations are shown in Appendix Table B-13.

Table 6-16
Comparison of Facility Maximum Annual Emissions Increase with BAAQMD CEQA Annual Thresholds of Significance[a]

Pollutant	Emissions[b] (tons per year)	Significant Emission Levels (tons per year)	Significant?
NOx	8.0	10	No
POC	9.3	10	No
PM_{10} (exhaust)	0.84	15	No
$PM_{2.5}$ (exhaust)	0.84	10	No

[a] BAAQMD. "Adopted Air Quality CEQA Thresholds of Significance," June 2, 2010.
[b] Detailed calculations are shown in Appendix Table B-13.

The facility maximum emissions of NOx, POC, PM_{10} (exhaust), and $PM_{2.5}$ (exhaust) would be less than the BAAQMD CEQA daily and annual thresholds of significance. Therefore, these Project criteria pollutant emissions are determined to be less than significant.[25]

6.2.2 Toxic Air Contaminant Emissions

Toxic air contaminants are compounds that have been identified to pose a potential health hazard upon human exposure. Nine of these pollutants are regulated under the federal New Source Review program: lead, asbestos, beryllium, mercury, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur, and reduced sulfur compounds. In addition to these nine compounds, EPA currently lists 188[26] substances as potential hazardous air pollutants. California Assembly Bill (AB) 2588, the Air Toxics "Hot Spots" Information and Assessment Act, defined over 700 toxic air contaminants (TACs) for which reporting is required if emitted in excess of specified threshold amounts. The BAAQMD provides a list of approximately 200 compounds defined as toxic air contaminants in Rule 5 (New Source Review of Toxic Air Contaminants) of Regulation 2 (Permits). All pollutants that may be emitted from the Project and are listed in any of the above regulations have been considered in this analysis.

Emission factors were determined by reviewing the available technical data. Toxic air contaminant emission factors for 190 compounds emitted from the engines and flares were obtained from AP-42,[27] and are listed in Appendix D, Table D-1.

Out of the 190 compounds that may be emitted from the Project, only the 9 compounds listed in Table 6-17 have annual emission rates high enough to exceed the BAAQMD chronic trigger levels shown in the table, and none of the compounds have one-hour emission rates that exceed the BAAQMD acute trigger levels. The three Diesel-fueled emergency standby generator engines emit only one toxic air contaminant—Diesel exhaust particulate matter (DPM), or the PM_{10}/$PM_{2.5}$ emitted by the engine. The 9 exceedances shown in Table 6-17 trigger the need for a screening health risk assessment, as required by Regulation 2 (Permits) Rule 5 (New Source Review of Toxic Air Contaminants) Section 2-5-110, and which complies with BAAQMD guidelines.[28] The District guidelines are based on guidelines and technical support documents published by the California Office of Environmental Health Hazard Assessment (OEHHA).[29] Because emissions of each individual HAP are below 10 tons per year and total HAP emissions

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[25] BAAQMD. "CEQA Air Quality Guidelines," page 2-1, June 2010.
[26] http://www.epa.gov/air/toxicair/newtoxics.html.
[27] U.S. EPA. Compilation of Air Pollutant Emission Factors, Volume 1 - Stationary Point and Area Sources, Chapter 2 - Solid Waste Disposal, Draft Section 2.4 - Municipal Solid Waste Landfills, Table 2.4-4 (Emission Factors for Secondary Compounds Exiting Control Devices) and Mean concentrations (ppmv) in Appendix C - Landfill Gas Constituents (Uncorrected Concentrations), October 2008, as recommended by Carol Allen (BAAQMD) in telephone conversation with Eric Walther at Sierra Research on May 3, 2010.
[28] BAAQMD. Appendix D, Proposed BAAQMD Health Risk Screening Analysis (HRSA) Guidelines, June 2005.
[29] OEHHA. Air Toxics "Hot Spots" Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003.

are below 25 tons per year, none of the emitting units are subject to the major source NESHAPS/MACT requirements in 40 CFR Part 63. However, the area source NESHAPS requirements will apply to the project.

Table 6-17
Toxic Air Contaminants Emitted Above Rule 2-5 Thresholds

Pollutant	1-Hour Emission Rate (lb/hr)	BAAQMD Rule 2-5 Acute Triggering Level (lb/hr)	Annual Emission Rate (lbs/year)	BAAQMD Rule 2-5 Triggering Level (lbs/year)
1,1,2,2-Tetrachloroethane	3.2E-03	-	28.2	1.9
1,3-Butadiene	2.7E-04	-	2.4	0.63
Benzene	4.9E-03	2.9	43.2	3.8
Dichlorobenzene	3.3E-03	-	29.1	9.5
Ethylbenzene	2.3E-02	-	206	43
Hydrogen sulfide	4.6E-02	0.093	477	390
Naphthalene	6.5E-04	-	5.8	3.2
Tetrachloroethylene	8.5E-03	44	75	18
Vinyl chloride	2.2E-03	400	19.7	1.4

6.2.3 Greenhouse Gases

California has adopted comprehensive legislation, AB 32, to reduce the state's GHG emissions, including emissions generated outside California to produce electric power used within the state. CARB is developing regulations to implement AB 32, and has already adopted regulations requiring specified sources of greenhouse gases in California to report their emissions, including combustion sources of 25,000 metric tons of CO_2 emissions.[30] However, CARB has proposed lowering this reporting threshold to 10,000 metric tons of CO_2 equivalent emissions.[31] This facility will report its GHG emissions as required by the regulations, and will comply with all future GHG regulations. The greenhouse gas emissions from the Project are summarized in Table 6-18.

[30] 17 Cal. Code of Regs. 95100 *et. seq*.
[31] CARB. "Proposed Amendments to the Regulation for the Mandatory Reporting of Greenhouse Emissions," October 28, 2010, http://www.arb.ca.gov/regact/2010/ghg2010/ghgisoratta.pdf.

Table 6-18 Maximum Project Greenhouse Gas Emissions[a]					
	CO_2	CH_4	N_2O	SF_6	Total GHG
Maximum Annual Emissions, tpy					
Engines (4) [b] or	21,753 [c]	0.19	0.021		-
Circuit Breakers (3)				0.0011	-
Flares (3)	453 [c]	0.0039	0.00044	-	-
Biofilter 1 (1)	122	0.0050	0.0010	-	-
Biofilters 2 + 3 (2)	145	0.0060	0.0012	-	-
Diesel Emergency Generator Engine (3)	31.4	0.0013	0.00026	-	-
Outdoor Front-end Loaders	148	0.0061	0.0012	-	-
On-road Mobile Sources	161	0.0068	0.0014		
Project Totals, tpy	22,814	0.22	0.026	0.0011	-
Global Warming Potential[d]	1	21	310	23,900	-
Total Project, $MMTCO_2e$[e,f]	0.0207	4.15E-06	7.44E-06	2.4E-05	0.0208

[a] See Appendix B, Table B-13 for calculations.
[b] Number in parentheses after each source type refers to the number of emitting units in the facility. Six CHP engines emit equivalent to 4 full-load operation engines.
[c] Biogenic CO_2 emissions are excluded from comparison with the BAAQMD GHG threshold of significance; BAAQMD. "GHG Plan Level Quantification Guidance," p. 2, April 5, 2010.
[d] CARB. "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 2, page Appendix A-4, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
[e] Totals may not be exact because of rounding.
[f] Million metric tons of carbon dioxide equivalent per year.

6.2.4 Odor Compounds

The organic feedstock for the Project originates in MSW, which contains sulfur compounds from various household and commercial solid wastes. Pollutants emitted from the anaerobic digestion of these sulfur-containing wastes include reduced sulfur compounds, a complex group of compounds that are assumed to be approximately one-third carbon sulfide, one-third dimethyl disulfide, and one-third acetic acid. Another reduced sulfur odorous compound[32] that is generated by the anaerobic digestion is hydrogen sulfide. The aerobic composting of the material that remains after anaerobic digestion generates ammonia, also malodorous. Trace concentrations of a total of 20 odorous compounds having odor thresholds will be emitted from the project. The

[32] An odorous compound is defined as an emittant from the project that has an EPA-identified odor threshold found in EPA guidance (U.S. EPA. "Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990," EPA600/R-92/047, March 1992), and the following document for ammonia: "Compilation of Odor and Taste Threshold Values Data" (American Society for Testing and Materials, edited by F.A. Fazzalari, ASTM Data Series DS 48A, February 1978).

approximate emission rates of these odor groups are shown in Table 6-19 and the underlying calculations are contained in Appendix D.

Table 6-19 Odor Compound Emissions	
Pollutant	Emissions (lbs per year)
Ammonia (NH_3)	867
Reduced Sulfur Compounds [a]	
Carbon disulfide	4.9
Dimethyl disulfide	5.6
Acetic acid	33
Hydrogen sulfide	477
19 other odorous compounds having odor thresholds	1,125

[a] Rosenfeld, P., M. Grey, and P. Sellew, "Measurement of Biosolids Compost Odor Emissions from a Windrow, Statis Pile, and Biofilter," Water Environment Research, Volume 76, Number 4, pp. 310-315, 2004.

6.3 Operational Air Quality Impact Analysis

Potential ambient air quality impacts must be quantified for review by the Lead Agency under CEQA, and also to obtain a District Authority to Construct permit under BAAQMD New Source Review Regulation 2. This quantitative analysis is presented below.

6.3.1 Criteria Pollutants

6.3.1.1 Air Quality Modeling Methodology

Impacts of the Project on ambient air quality were analyzed using EPA-approved air quality dispersion models. These models are based on mathematical descriptions of atmospheric turbulent entrainment and dispersion processes in which a pollutant source impact can be calculated over a given area.

The impact analysis was used to determine the maximum ground-level impacts of the Project. The results are compared with established state and federal ambient air quality standards and EPA PSD and nonattainment New Source Review SILs. If the SILs are not exceeded under these worst-case conditions, then it is demonstrated that no exceedances are expected under any conditions. In accordance with the air quality impact analysis

guidelines developed by EPA[33] and CARB,[34] the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures; and
- Impacts from inversion breakup (fumigation).

Modeling methodology details are discussed in Appendix E.

Background Air Quality

To assure that the impacts from the Project will not cause or contribute to a violation of an ambient air quality standard, the existing air quality in the area of the Project was analyzed (see Section 4.1.4). The Project is relying on air quality monitoring data collected at the monitoring stations discussed in Section 4.1.4 to satisfy the requirement for background air quality. The last five years (i.e., 2005-2009) of ambient monitoring data have been used because they are representative of the area's air quality where the maximum impacts occur due to the proposed source. According to EPA guidance,[35] the background data need not be collected on site, as long as the data are representative of the air quality in the subject area. Three criteria are applied in determining whether the background data are representative: (1) monitoring location, (2) data quality, and (3) how current the data are.[36] These criteria are defined below.

- Location: The measured data must be representative of the areas where the maximum concentration occurs for the proposed stationary source, existing sources, and a combination of the proposed and existing sources.

- Data quality: Data must be collected and equipment must be operated in accordance with the requirements of 40 CFR Part 58, Appendices A and B, and PSD monitoring guidance.

- Current data: The data are current if they have been collected within the preceding three years and are representative of existing conditions.

The data used in this analysis meet the requirements of Appendices A and B of 40 CFR Part 58, and thus all meet the criterion for data quality. The data have been collected for at least the preceding three years, and thus all meet the criterion for being current. The locations of the data sets used to represent background concentrations of each pollutant are discussed individually below.

NO_2 – Ambient NO_2 data have been collected at the San Jose-Jackson Street monitoring station for the six-year period of 2004-2009, and at the 4th Street station for the 31 years

[33] U.S. EPA, Guideline on Air Quality Models, 40 CFR Part 51, Appendix W.
[34] CARB, Reference Document for California Statewide Modeling Guideline, April 1989.
[35] U.S. EPA, Guideline on Air Quality Models, 40 CFR Part 51, Appendix W, Section 9.2.
[36] U.S. EPA, Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), 1987.

1972-2002. These monitoring stations are located approximately 6.5 miles from the Project site. The NO_2 levels monitored at these monitoring stations reflect NO_2 concentrations in the vicinity of the Project, and thus meet the criterion for location.

SO_2 – The nearest ambient SO_2 monitor to the Project is at the San Francisco-Arkansas Street monitoring station, located approximately 33 miles from the Project. San Francisco is heavily populated and developed, similar to the Project area; therefore, the low SO_2 concentrations measured in San Francisco provide reasonably representative background SO_2 levels for assessing the impacts of the Project, and thus meet the location criterion.

CO – The nearest monitor that records CO is located at the San Jose-Jackson Street monitoring station. The CO levels monitored at this monitoring station reflect CO concentrations in the vicinity of the Project, and thus meet the criterion for location.

PM_{10} and $PM_{2.5}$ – The nearest PM_{10} and $PM_{2.5}$ monitors are located at the San Jose-Jackson Street monitoring station. The PM_{10} and $PM_{2.5}$ levels measured at this monitoring station reflect PM_{10} and $PM_{2.5}$ concentrations in the vicinity of the Project, and thus meet the criterion for location.

6.3.1.2 Ambient Air Quality Impacts

The maximum Project impacts calculated from each of the modeling analyses described above are summarized in Table 6-20. The detailed results of the fumigation modeling analysis are summarized in Appendix Table E-3.

To conservatively determine the Project's air quality impacts, the modeled maximum potential concentrations are added to the maximum background ambient air concentrations, and compared to the applicable ambient air quality standards. The modeled concentrations are presented in Table 6-20, while the maximum background monitored concentrations and exceedances were presented in Table 4-2. Table 6-21 presents the maximum concentrations of NOx, SO_2, CO, PM_{10}, and $PM_{2.5}$ recorded for 2005 through 2009 from the San Jose-Jackson Street and San Francisco-Arkansas Street monitoring stations, with the gas concentrations converted to units of $\mu g/m^3$ for comparison to modeling results.

Table 6-20 Project Air Quality Modeling Results			
		Maximum Modeled Concentrations ($\mu g/m^3$)	
Pollutant	Averaging Time	AERMOD	Fumigation SCREEN3
NO_2	1-hour, NAAQS 1-hour, CAAQS Annual	158.0 [a] 225.6 [a] 5.4[b]	9.7 9.7 [e]
SO_2	1-hour 3-hour 24-hour Annual	19.6[c] 15.6 8.9 2.4	20.0 18.0 8.0 [e]
CO	1-hour 8-hour	1,318 559	116 81
PM_{10}	24-hour Annual	1.8 0.33	0.7 [e]
$PM_{2.5}$	24-hour Annual	1.2 0.27[d]	0.7 [e]

[a] Ambient background concentrations added to facility impact hour by hour.
[b] Includes an Ambient Ratio Method (ARM) national default value of 0.75.[37]
[c] 5-year (2005-2009) average of the 99th percentile of maximum daily 1-hour concentrations following guidance[38]
[d] 5-year (2005-2009) average of the first high Annual Arithmetic Mean, following guidance.[39]
[e] Not applicable, because inversion breakup is a short-term phenomenon and as such is evaluated only for short-term averaging periods.

[37] U.S. EPA. 40 CFR Part 51 Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule, Federal Register, Volume 70, No. 216, Section 5.2.4 (Models for Nitrogen Dioxide (Annual Average), November 9, 2005; Chu, Shao-Hang and Edwin L. Meyer. "Use of Ambient Ratios to Estimate Impact of NOx Sources on Annual NO2 Concentrations," Paper 91-180.6 presented at the 84th Annual Meeting & Exhibition, Vancouver, British Columbia, Canada, June 16-21, 1991.
[38] U.S. EPA. "Applicability of Appendix W Modeling Guidance for the 1-hour SO2 National Ambient Air Quality Standard," Memorandum from Tyler Fox, Leader, Office of Air Quality Planning and Standards Air Quality Modeling Group, to Regional Air Division Directors, August 23, 2010.
[39] U.S. EPA. "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS," memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to EPA Regional Modeling Contacts and others, March 23, 2010.

Table 6-21 Ambient Air Quality Maximum Background Concentrations, 2005-2009 (µg/m^3)						
Pollutant	Averaging Time	2005	2006	2007	2008	2009
San Jose						
NO_2	1-Hour	139.4	139.4	137.2	**150.7**[a]	130.0
	Annual	**36.1**	34.2	32.3	32.3	28.5
San Francisco						
SO_2	1-Hour	49.8	**65.5**	41.92	55.0	[b]
	3-Hour	44.8 [c]	**59.0**[c]	37.7[c]	49.5[c]	[b]
	24-Hour	18.4	**18.4**	5.2	10.5	[b]
	Annual	2.7	**2.7**	2.6	2.7	[b]
San Jose						
CO	1-Hour	**4,945**	4,715	4025	3795	3910
	8-Hour	**3,456**	3,245	3011	2756	2778
PM_{10}	24-Hour	53.5	**73.2**	69.1	57.3	43.3
	Annual	22.3	21	21.9	**23.4**	20.3
$PM_{2.5}$	24-Hour Max	54.6	**64.4**	57.5	41.9	35
	98th Percentile 24-Hr	**39.8**	36	39.1	32.4	29.8
	3-Year Avg 98th Percentile	39	**39**	38	36	34
	Annual Arithmetic Mean	**11.7**	10.7	10.7	11.5	10.1
	3-Year Avg AAM [d]	**11.7**	11.4	11.1	11	10.8

[a] Values in bold type are maxima.
[b] Insufficient data.
[c] Estimated from 1-hour concentrations by use of EPA averaging time ratios (i.e., 0.9 for 3 hours)
[d] Annual arithmetic mean.

Maximum ground-level impacts due to operation of the Project are shown together with the ambient air quality standards in Table 6-22. Using the conservative assumptions described earlier, the results indicate that the Project will not cause or contribute to violations of any state or federal air quality standards, with the exception of the state PM_{10} and $PM_{2.5}$ standards. For these pollutants, existing 24-hour average PM_{10} background concentrations and PM_{10} and $PM_{2.5}$ annual background concentrations already exceed the state and federal standards.

The results of the ambient air quality impacts analysis are used to determine if Project impacts are significant. For any pollutant and averaging time combination in Table 6-22 whose total impact exceeds an ambient air quality standard, the determination of significance is based on whether the maximum facility impact alone exceeds the appropriate established significance level shown in Table 6-23. If no significance level is exceeded, no further ambient air quality impact analysis is required.

Table 6-22 Modeled Maximum Project Operation Air Quality Impacts						
Pollutant	Averaging Time	Maximum Facility Operation Impact[a] ($\mu g/m^3$)	Representative Background Concentration[b] ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour, NAAQS	[c]	[c]	158.0	-	188.7[d]
	1-hour, CAAQS	[c]	[c]	225.6	339	-
	Annual	5.4	36.1	41.5	57	100
SO_2	1-hour	19.6[e]	65.5	85.1	655	200[f]
	3-hour	15.6	59.0	74.6	-	1,300
	24-hour	8.9	18.4	27.3	105	-
	Annual	2.4	2.7	5.1	-	80
CO	1-hour	1,318	4,945	6,263	23,000	40,000
	8-hour	559	3,456	4,015	10,000	10,000
PM_{10}	24-hour	1.8	**73.2**	**75.0**	50	150
	Annual[g]	0.33	**23.4**	**23.8**	20	-
$PM_{2.5}$	24-hour	1.2	**39**	**40.2**	-	35
	Annual[g]	**0.27**	11.7	**12.0**	12	15.0

[a] From Table 6-20.
[b] From Table 6-21.
[c] Ambient background concentrations added to facility impact hour by hour.
[d] NAAQS is 100 ppbv, which converts to 188.7 $\mu g/m^3$ at 25ºC.
[e] 5-year (2005-2009) average of the 99th percentile of maximum daily 1-hour concentrations following guidance[40]
[f] NAAQS is 0.075 ppmv, which converts to 200.0 $\mu g/m^3$ at 25ºC
[g] Annual Arithmetic Mean over 5 years (2005-2009), following guidance.[41]

[40] U.S. EPA. "Applicability of Appendix W Modeling Guidance for the 1-hour SO2 National Ambient Air Quality Standard," Memorandum from Tyler Fox, Leader, Office of Air Quality Planning and Standards Air Quality Modeling Group, to Regional Air Division Directors, August 23, 2010.
[41] U.S. EPA. "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS," memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to EPA Regional Modeling Contacts and others, March 23, 2010.

Table 6-23 Ambient Air Quality Significant Impact Levels[a]		
Pollutant	Averaging Time	Significant Impact Levels ($\mu g/m^3$)
PM_{10}	24-hour Annual	5 1
$PM_{2.5}$	24-hour Annual	1.2[b] 0.3 [b]

[a] From PSD regulations (40 CFR 52.21 and 51.165)
[b] EPA Final Rule[42]

Table 6-24 shows that the Project criteria pollutant emissions will not cause a significant air quality impact.

Table 6-24 Comparison of Maximum Modeled Impacts with Significant Impact Levels				
Pollutant	Averaging Time	Maximum Modeled Impacts ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Less Than Significant?
PM_{10}	24-Hour Annual	1.8 0.39	5 1	Yes Yes
$PM_{2.5}$	24-Hour Annual	1.2 [a] 0.27[b]	1.2 [c] 0.3 [c]	Yes Yes

[a] Highest project impact during the period 2005-2009 when the sum of the project and background concentrations exceeds the 35 $\mu g/m^3$ NAAQS following EPA guidance, and the impact is rounded to the same one decimal precision as the SIL.
[b] 5-year (2005-2009)average of the first high Annual Arithmetic Mean, following guidance.[43]
[c] SILs for Class II areas in EPA Final Rule[44]

The maximum modeled impacts from the Project are compared with the significant impact levels in Table 6-24 above. These comparisons show that maximum potential impacts do not exceed the SILs and no further analysis is required.

[42] U.S. EPA. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5) - Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Final Rule, Federal Register, Volume 75, Number 202, pp. 64864-64907, October 20, 2010.
[43] U.S. EPA. "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS," memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to EPA Regional Modeling Contacts and others, March 23, 2010.
[44] U.S. EPA. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5) - Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Final Rule, Federal Register, Volume 75, Number 202, pp. 64864-64907, October 20, 2010.

6.3.2 Toxic Air Contaminants/Health Risk Assessment

This section presents the methodology and results of a human health risk assessment performed to assess potential impacts and public exposure associated with airborne emissions of toxic air contaminants from operation of the Project.

Air will be the dominant pathway for potential public exposure to toxic air contaminants emitted by the Project. Emissions to the air will consist primarily of combustion by-products produced by the six biogas-fueled engines: two in each phase.[45] Additional toxic air contaminants will be emitted by the following equipment in each of the three phases: one biofilter operating continuously, one Diesel fuel-fired emergency generator engine tested for one-half hour each week, one flare operated for five days each year while the CHP engines undergo maintenance, and seven front-end loaders operating 8 hours during the 10 hours the facility is open. The emitted toxic air contaminants are listed in detail in Appendix D. The project will include Toxics-Best Available Control Technology (T-BACT) as required under BAAQMD rules.

Diesel particulate matter (DPM) will be emitted by both the weekly half-hour testing of the three emergency generator engines, the daily 8-hour operation of the seven front-end loaders, the onsite truck hauling of incoming putrescible waste and amendment material and outgoing compost product, and the daily delivery of operating supplies. Potential health risks from combustion emissions will occur almost entirely by direct inhalation. To make the analysis more conservative, additional pathways for dermal absorption, soil ingestion, and mother's milk ingestion were included in the health risk modeling. The health risk assessment methodology was conducted in accordance with guidance established by OEHHA,[46] CARB,[47] and the BAAQMD.[48]

6.3.2.1 Public Health Impact Study Methods

Emissions of toxic air contaminants from the project were estimated using emission factors approved by CARB and EPA. Air dispersion modeling combined the emissions with site-specific terrain and meteorological conditions to estimate short-term (1-hour) and long-term (annual) arithmetic mean concentrations in air for use in the health risk assessment. The EPA-recommended air dispersion model, AERMOD, was used along with five years (2005-2009) of representative meteorological data from San Jose International Airport. The meteorological data combined surface measurements made at San Jose International Airport with upper air data from Oakland International Airport. The health risk assessment has been prepared using basic data (i.e., cancer unit risk factors and non-cancer chronic and acute reference exposure levels [RELs][49]) from

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[45] Emissions on average from the six engines are equivalent to the annual emissions of four of the engines running at full load.

[46] OEHHA. "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," August 2003.

[47] CARB. Consolidated Table of OEHHA/ARB-Approved Risk Assessment Health Values, April 25, 2005, http://www.arb.ca.gov/toxics/healthval/healthval.htm.

[48] BAAQMD. "Air Toxics NSR Program Health Risk Screening Analysis Guidelines," June 2005.

[49] The 8-hour RELs for some toxic air contaminants are not included in the HRA because OEHHA has not published detailed guidance on their recommended analysis methodology, and the HARP software does not contain data related to 8-hour RELs.

CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4b), and associated guidance.[50] Because HARP is built on a previous EPA-approved air dispersion model, Industrial Source Complex Short Term, Version 3 (ISCST3), a special method was used to integrate the air dispersion modeling output from the required air dispersion model, AERMOD, with the risk calculations in the HARP risk module. The output from AERMOD is provided as the input to CARB's HARP On-Ramp software,[51] which formats the output as required to become input information in the format required by HARP. This approach combines the advantages of AERMOD as the preferred air dispersion model with HARP, the preferred health risk assessment software.

Health impacts were evaluated for a hypothetical maximum exposed individual (MEI) located at the nearest residence and offsite worker where the highest exposure to TACs is predicted, following BAAQMD's rule for New Source Review of Toxic Air Contaminants[52] and guidance.[53] The rule defines a Maximally Exposed Individual (MEI) in terms of residential, worker, and student receptors. The Maximally Exposed Individual Resident (MEIR) is an individual assumed to be located at the maximally exposed residential receptor. BAAQMD Regulation 2, Rule 5 defines a "residential receptor" as any location where an individual may reside for a period of six months or more out of a year. The Maximally Exposed Individual Worker (MEIW) is an individual assumed to be working at the maximally exposed receptor for his or her entire working life. The nearest student receptors are located at the K-12 schools, which are listed with their addresses, coordinates and distances from the project in Appendix Table A-2, all of which are further away than the nearest residence, which is listed in Appendix Table A-4.

Health risks potentially associated with concentrations of carcinogenic pollutants in air were calculated as estimated excess lifetime cancer risks. The inhalation excess cancer risk associated with the project is calculated by the software from the ground-level concentration and inhalation cancer potency slope as follows:

$$ECR_{ij} = CONC_{ij} * ICPF_i * BR$$

where: ECR_{ij} = excess cancer risk from carcinogen i at location j;
$CONC_{ij}$ = ground-level concentration (in $\mu g/m^3$) of carcinogen i at location j;
$ICPF_i$ = inhalation cancer potency factor for carcinogen i (in kg-day/mg); and
BR = breathing rate (in L/kg-day).

The total carcinogenic risk at location j is found by summing the contributions from each carcinogen i. The resulting ECR_j can be plotted over all calculated locations.

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[50] OEHHA. "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," August 2003; BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," June 2005; and BAAQMD. "California Environmental Quality Act Air Quality Guidelines," May 2010.
[51] CARB. "HARP On-Ramp, Version 1", http://www.arb.ca.gov/toxics/harp/downloads.htm.
[52] BAAQMD. "Regulation 2 – Permits, Rule 5 – New Source Review of Toxic Air Contaminants," January 6, 2010.
[53] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," p. 4, January 2010.

Evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in air was performed by comparing modeled concentrations in air with the RELs. An REL is a concentration in air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in air and the REL. This ratio is referred to as a health hazard quotient. The inhalation cancer potency factors and RELs used to characterize health risks associated with modeled concentrations in air are imbedded in the risk module of HARP (Version 1.4b), published by CARB,[54] and are presented in Appendix F.

Characterization of Risks from Toxic Air Pollutants

The estimated potential maximum cancer risks associated with concentrations in air estimated for the MEIR and MEIW locations are shown in Table 6-25. The maximum cancer risk is well below the 10×10^{-6} threshold of significance at the nearest residences and for offsite workers, based on emissions from project equipment applying T-BACT. The MEIR is located at the closest residence in the residential area south-southeast of the project (see Figure 6). The MEIW is located at the Point of Maximum Impact (PMI) on the boundary of the project adjacent to the entrance buildings of the Zanker Landfill (see Figure 17).

The 70-year lifetime risk, as calculated by the HARP software using the Derived (Adjusted) Method, is adjusted for the sensitivity of infants and children through multiplication by a Cancer Risk Adjustment Factor of 1.7.[55] The resulting MEIR (see Table 6-25) remains less than significant.

[54] CARB. "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values," February 5, 2009.
[55] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," January 2010, http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx.

Table 6-25 Summary of Potential Health Impacts from Project Operation				
Receptor	Carcinogenic Risk[a] (per million)	$PM_{2.5}$ Concentration (annual average) ($\mu g/m^3$) [b]	Acute Health Hazard Index	Chronic Health Hazard Index
Maximally Exposed Individual Resident (MEIR)	0.32	0.27	0.01	0.0007
Maximally Exposed Individual Worker (MEIW)	5.6		0.29	0.03
Significance Level	10	0.3	1.0	1.0
Less than Significant?	Yes	Yes	Yes	Yes

[a] Derived (Adjusted) Method, including Cancer Risk Adjustment Factor of 1.7 for resident.[56]
[b] The BAAQMD considers "an incremental increase of greater than 0.3 $\mu g/m^3$ annual average $PM_{2.5}$ from a single source…a significant cumulatively considerable contribution."[57]

The maximum potential acute non-cancer health hazard index associated with concentrations in air is shown in Table 6-25. The acute non-cancer health hazard index for all target organs falls below 1.0, the threshold of significance.

Similarly, the maximum potential chronic non-cancer health hazard index associated with concentrations in air is shown in Table 6-25. The chronic non-cancer health hazard index also falls below 1.0, the threshold of significance.

The estimates of cancer and non-cancer risks associated with chronic or acute exposures fall below thresholds of significance for toxic air contaminants in air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. In other words, there is assumed to be no lower-bound threshold for carcinogenicity. Because risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans (i.e., the assumption being that humans are as sensitive as the most sensitive animal species). Therefore, the true risk is not likely to be higher than risks estimated using inhalation cancer potency factors and is most likely lower, and could even be zero.[58][59]

[56] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," p. 4, January 2010.
[57] BAAQMD. "CEQA Guidelines," May 2010.
[58] U.S. EPA. "Guidelines for Carcinogen Risk Assessment," Federal Register, Volume 51, Number 185, pages 33992-34003, 1986.
[59] U.S. EPA. "Proposed Guidelines for Carcinogen Risk Assessment," Federal Register, Volume 61, Number 79, pages 17960-18011, 1996.

The analysis of potential cancer risk described herein employs methods and assumptions generally applied by regulatory agencies for this purpose. Given the importance of assuring that a project does not cause a significant public health impact, these methods and assumptions are highly conservative. Conservative methodology and assumptions used are outlined below.

- The analysis includes representative weather data over a period of five years to assure that the least favorable conditions producing the highest ground-level concentration of project emissions are included.

- The Project is assumed to operate at hourly, daily, and annual emission conditions that produce the highest ground-level concentrations.

- The location of the highest ground-level concentrations of Project emissions at a residential receptor is identified and the analysis then assumes that a sensitive individual resides at this location constantly over the entire 70-year period.

Taken together, these methods and assumptions create a scenario that cannot exist in the real world. For example, if the worst-case weather conditions occur on a winter evening, but the worst-case emission rates occur on a summer afternoon, the analysis nonetheless assumes that these events occur at the same time. The point of using these unrealistic assumptions is to consciously overstate the potential impacts. No one individual will experience exposures as great as those assumed for this analysis. By determining that even this highly overstated exposure will not be significant, the analysis enables a high degree of confidence that the much lower exposures that actual persons will experience will not result in any significant increase in cancer risk. In short, the analysis assures that there will not be any significant public health impacts at any location, under any weather condition, under any operating condition.

Operation Odors

A small amount of ammonia used to control NOx emissions from the CHP engines can "slip" past the SCR catalyst. This leakage is known as ammonia "slip," and will be less than 10 ppmv. Ammonia will also be produced by the aerobic composting process and emitted from the three biofilters at concentrations no higher than 20 ppbv. The biofilters will also emit other reduced sulfur compounds at concentrations less than 15 ppbv. The composition of the other reduced sulfur compounds is represented as one-third carbon disulfide, one-third dimethyl disulfide, and one-third acetic acid.[60]

The emissions of ammonia and all other odorous compounds discussed herein were subjected to the same air dispersion modeling as the project emissions of criteria pollutants and toxic air contaminants. The odor thresholds and maximum offsite ground

[60] Rosenfeld, P., M. Grey, and P. Sellew, "Measurement of Biosolids Compost Odor Emissions from a Windrow, Statis Pile, and Biofilter," Water Environment Research, Volume 76, Number 4, pp. 310-315, 2004.

level concentrations for the odorous compounds emitted by the Project are shown in Table 6-26.

After mixing with the atmosphere, the concentration of ammonia at ground level, shown in Table 6-26, will be far below the detectable odor threshold of 5 ppmv that the Compressed Gas Association has determined to be acceptable, as well as being below the ACGIH[61] Threshold Limit Value (TLV) and Short-Term Exposure Level (STEL) values (adopted in 2003) of 25 and 35 ppm, respectively. Therefore, potential ammonia emissions would not create a significant odor.

The low maximum concentrations of the other odorous compounds that are emitted from the combustion of biogas in the CHP engines and flares are also below their odor thresholds, as shown in Table 6-26. Therefore, the project emissions of odorous compounds will not cause a detectable odor outside the project boundary.

Table 6-26
Odor Compounds, Detection Thresholds and Maximum Concentrations

Compound	Threshold of Detection ($\mu g/m^3$)	Maximum Concentration ($\mu g/m^3$)	Below Threshold?
Acetonitrile	1,950,000	2.84E-02	yes
Carbon tetrachloride	884,000	1.53E-03	yes
1,4-Dioxane (1,4-Diethylene dioxide)	270,000	8.95E-04	yes
Hexylbenzene	230,000	1.30E-04	yes
Ammonia[(2A)]	3,540	5.25E+00	yes
1,2-Dichloroethane (Ethylene dichloride)	165,000	2.96E-02	yes
Benzene	108,000	2.20E-01	yes
Hydrogen chloride	15,000	1.66E-01	yes
1,1,2,2-Tetrachloroethane	50,000	1.44E-01	yes
Toluene (Methyl benzene)	25,400	3.62E+00	yes
Chlorobenzene	5,900	8.08E-02	yes
1,3-Butadiene (Vinyl ethylene)	2,400	1.22E-02	yes
Formaldehyde	1,200	4.80E-04	yes
1,2-Dichloropropane	2,400	5.67E-03	yes
Ethylbenzene	2,000	1.05E+00	yes
Carbon disulfide	650	1.23E-01	yes
Dichlorobenzene	730	1.48E-01	yes
Carbonyl sulfide (Carbon oxysulfide)	250	8.40E-02	yes
Acetaldehyde	120	4.75E-03	yes
Benzyl chloride	210	2.90E-03	yes

[61] American Congress of Government Industrial Hygienists

6.3.3 Greenhouse Gases/Climate Change Impacts

Because GHG emissions potentially produce cumulative impacts when all sources on the planet combine their emissions (see Table 4-4) to generate the global levels (e.g., 389.5 ppmv CO_2in 2010)[62], the air quality impact of the Project GHG emissions is discussed in Section 6.5.2 (Greenhouse Gas Cumulative Impact Analysis).

6.4 Construction Air Quality Impacts Analysis

6.4.1 Criteria Pollutants

Emissions due to the construction phase of the Project have been estimated, including an assessment of emissions from onroad vehicle and nonroad equipment exhaust and the fugitive dust generated from material handling. Table 6-27 summarizes the construction emissions and BAAQMD significance thresholds.

Table 6-27
Facility Construction Emissions
and BAAQMD CEQA Thresholds of Significance[a]

Pollutant	Average Daily Emissions (pounds per day)	BAAQMD Significant Emission Levels (pounds per day)	Significant?
NOx	29.4	54	No
POC	3.5	54	No
PM_{10} (exhaust)	1.2	82	No
$PM_{2.5}$ (exhaust)	1.2	54	No
PM_{10} (fugitive)	3.6	None	NA [b]
$PM_{2.5}$ (fugitive)	0.55	None	NA
SO_2	0.057	None	NA
CO	29.6	None	NA
CO_2	7,271	None	NA
CH_4	0.39	None	NA
N_2O	0.11	None	NA

[a] BAAQMD. "Adopted Air Quality CEQA Thresholds of Significance," June 2, 2010.
[b] Not applicable.

Fugitive dust emission control techniques considered best management practice will be used, including those listed below.

[62] CARB, CARB Almanac 2009, Chapter 5 – Toxic Air Contaminant Emissions, Air Quality, and Health Risk, http://www.arb.ca.gov/aqd/almanac/almanac09/pdf/chap509.pdf.

- Exposed soil (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered at least two times per construction day.

- Haul trucks transporting soil, sand, or other loose material off-site will be covered.

- Visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per construction day.

- Vehicle speeds on unpaved roads will be limited to 15 mph.

- Roadways, driveways, and sidewalks will be paved as soon as possible.

- Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.

- Idling times will 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 regarding this idling limit will be provided for heavy-duty equipment operators at all access points.

- Construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. Heavy-duty construction equipment will be checked by a certified mechanic and determined to be running in proper condition prior to operation.

- A publicly visible sign will be posted with the telephone number and person to contact at the City of San Jose regarding dust complaints, and with the BAAQMD phone number to assure compliance with applicable regulations.

A dispersion modeling analysis was conducted based on these emissions. A detailed analysis of the emissions and ambient impacts is included in Appendix G. The results of the analysis are shown in Table 6-28, and indicate that the maximum construction impacts will be below state and federal ambient air quality standards for all criteria pollutants, except that background 24-hour PM_{10} and $PM_{2.5}$ levels and annual PM_{10} levels will exceed ambient air quality standards. Table 6-29 shows that the Project contributions to these pollutants and averaging times are below their respective SILs, and hence, the impacts are less than significant.

Table 6-28 Modeled Maximum Project Construction Air Quality Impacts						
Pollutant	Averaging Time	Maximum Facility Construction Impact (μg/m^3)	Representative Background Concentration[a] (μg/m^3)	Total Impact (μg/m^3)	State Standard (μg/m^3)	Federal Standard (μg/m^3)
NO_2	1-hour, NAAQS	[b]	[b]	135.9	-	188.7 [c]
	1-hour, CAAQS	152.9	150.7	303.6	339	-
	Annual	2.3	36.1	38.4	57	100
SO_2	1-hour	0.3[d]	65.5	65.8	655	200[e]
	3-hour	0.2	59.0	59.2	-	1,300
	24-hour	0.04	18.4	18.5	105	-
	Annual	0.0026	2.7	2.7	-	80
CO	1-hour	109	4,945	5,054	23,000	40,000
	8-hour	33	3,456	3,489	10,000	10,000
PM_{10}	24-hour	3.3	**73.2**	**76.5**	50	150
	Annual[f]	0.28	**23.4**	**23.7**	20	-
$PM_{2.5}$	24-hour	**1.0**	**39**	**40.0**	-	35
	Annual[g]	0.12	11.7	11.82	12	15.0

[a] From Table 6-21
[b] Ambient background concentrations added to facility impact hour by hour.
[c] NAAQS is 100 ppbv, which converts to 188.7 μg/m^3 at 25ºC.
[d] 5-year (2005-2009) average of the 99th percentile of maximum daily 1-hour concentrations following guidance[63]
[e] NAAQS is 0.075 ppmv, which converts to 200.0 μg/m^3 at 25ºC
[f] Annual Arithmetic Mean
[g] Annual Arithmetic Mean over 5 years (2005-2009), following guidance.[64]

Table 6-29 Comparison of Maximum Modeled Construction Impacts with Significant Impact Levels				
Pollutant	Averaging Time	Maximum Modeled Impacts (μg/m^3)	Significant Impact Level (μg/m^3)	Less Than Significant?
PM_{10}	24-Hour	3.3	5	Yes
	Annual	0.28	1	Yes
$PM_{2.5}$	24-Hour	1.0 [a,d]	1.2 [b]	Yes
	Annual	0.1[c,d]	0.3[b]	

[a] 5-year average of the first high concentrations for those days during the period 2005-2009 when the sum of the project and background concentrations exceed the 35 μg/m^3 NAAQS following EPA guidance.[65]
[b] EPA SILs for Class II areas[66]
[c] 5-year (2005-2009)average of the first high Annual Arithmetic Mean, following guidance.[67]
[d] Impact rounded to the same one decimal precision as the SIL.

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[63] U.S. EPA. "Applicability of Appendix W Modeling Guidance for the 1-hour SO2 National Ambient Air Quality Standard," Memorandum from Tyler Fox, Leader, Office of Air Quality Planning and Standards Air Quality Modeling Group, to Regional Air Division Directors, August 23, 2010.
[64] U.S. EPA. "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS," memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to EPA Regional Modeling Contacts and others, March 23, 2010.
[65] U.S. EPA. "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS," memorandum from Tyler Fox to Erik Snyder and Jeff Robinson, February 26, 2010.
[66] U.S. EPA. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5) - Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule, Federal Register, Volume 72, Number 183, p. 54112, September 21, 2007.
[67] U.S. EPA. "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS," memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to EPA Regional Modeling Contacts and others, March 23, 2010.

6.4.2 Construction Toxic Air Contaminants/Health Risk Assessment

Construction of the Project is expected to take approximately 12 months. The initial 36 work days will be used to transport the 100,000 cubic yards of soil fill on to the project site, and the remainder of the 12 months will be used to construct the Phase 1 structures. Strict construction practices that incorporate safety and compliance with applicable laws, ordinances, regulations, and standards will be followed.

Temporary air emissions from construction are presented in detail in Appendix G, followed by a criteria pollutant air dispersion analysis that demonstrates ambient air quality standards will not be exceeded by construction of the project. The dominant emission with potential health risk is DPM from combustion of Diesel fuel in construction equipment (e.g., scrapers, tandem soil haul trucks). On-site DPM emissions from construction are summarized in Table 6-30.

Table 6-30
Maximum Construction Onsite DPM Emissions

Emitting Activity	lbs/day	tons per year
Construction Equipment	2.8	0.13

The detailed $PM_{2.5}$ calculations in Appendix G provide the maximum daily and annual DPM emission rates used as input to the construction HRA. Air dispersion modeling with AERMOD and health impact calculation with HARP, as discussed for operation emission of toxic air contaminants in Section 6.3.2 yield the results shown in Table 6-31. The analysis demonstrates that the potential cancer risk of DPM emissions during project construction will be less than the significance threshold of 10 in one million. The 70-year lifetime risk, as calculated by the HARP software using the Derived (Adjusted) Method, is adjusted for the sensitivity of infants and children through multiplication by a Cancer Risk Adjustment Factor of 1.7.[68] The resulting MEIR (see Table 6-31) remains less than significant.

[68] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," January 2010, http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx.

Table 6-31 Summary of Potential Health Impacts from Construction DPM				
Receptor	Carcinogenic Risk [a] (per million)	$PM_{2.5}$ Concentration (annual average) ($\mu g/m^3$) [b]	Acute Health Hazard Index	Chronic Health Hazard Index
Maximally Exposed Individual Resident (MEIR)	0.28	0.13	[c]	0.0001
Maximally Exposed Individual Worker (MEIW)	2.1		[c]	0.03
Significance Level	10	0.3	1.0	1.0
Less than Significant?	Yes	Yes	Yes	Yes

[a] Derived (Adjusted) Method, including Cancer Risk Adjustment Factor of 1.7 for resident[69]..
[b] The BAAQMD considers "an incremental increase of greater than 0.3 $\mu g/m^3$ annual average $PM_{2.5}$ from a single source…a significant cumulatively considerable contribution."[70]
[c] The toxic air contaminant emitted during construction is DPM, which has no acute reference exposure level (REL), and hence, no acute health hazard index can be computed.

6.5 Cumulative Air Quality Impact Analysis

An analysis of potential cumulative air quality impacts was conducted according to the BAAQMD CEQA guidelines.[71] The guidelines require that the cumulative air quality impact analysis consider not only the Project, but also other sources emitting toxic air contaminants and $PM_{2.5}$ within a distance of 1,000 feet from the Project fence line. The facilities that have emitting sources within that distance include the Zanker Landfill, Zanker Materials Processing Facility, and the San Jose/Santa Clara Water Pollution Control Plant. The health-related impact parameters and less-than-significant cumulative impacts from cumulative air dispersion modeling are shown in Table 6-32.

[69] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," p. 4, January 2010.
[70] BAAQMD. "CEQA Guidelines," May 2010.
[71] BAAQMD. "California Environmental Quality Act Air Quality Guidelines," June 2010.

Table 6-32 Summary of Potential Cumulative Health Impacts			
Receptor	Carcinogenic Risk[a] (per million)	$PM_{2.5}$ Concentration (annual average) ($\mu g/m^3$)	Chronic Health Hazard Index
Maximally Exposed Individual Resident (MEIR)	0.7		0.001
Maximally Exposed Individual Worker (MEIW)	2.4		0.009
BAAQMD CEQA Cumulative Significance Level [b]	100	0.8	10.0
Less than Significant?	Yes	Yes	Yes

[a] Derived (Adjusted) Method, including Cancer Risk Adjustment Factor for resident.[72]
[b] BAAQMD. "California Environmental Quality Act Air Quality Guidelines," June 2010.

The 70-year lifetime risk, as calculated by the HARP software using the Derived (Adjusted) Method, is adjusted for the sensitivity of infants and children through multiplication by a Cancer Risk Adjustment Factor of 1.7.[73] The resulting MEIR (see Table 6-25) remains less than significant.

6.5.1 Greenhouse Gas Cumulative Impact Analysis

Greenhouse gas (GHG) emissions have received increasing attention, as indicated most notably by the enactment of the California Global Warming Solutions Act of 2006. Combustion of biogas in the Project's CHP engines and flares, and Diesel fuel in the emergency standby generator engines and heavy-duty trucks and loaders would result in the emissions of CO_2, CH_4, and N_2O. Leaks from Project electrical equipment (e.g., circuit breakers) would emit SF_6. These GHG emissions from the Project would join the emissions of the same GHG from the combustion of fossil fuels from all sources (e.g., home natural gas heaters, coal-fired power plants) throughout the world and from natural sources (except SF_6).

GHG emissions for the Project are summarized in Table 6-33.

[72] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," p. 4, January 2010.
[73] BAAQMD. "BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," January 2010, http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx.

Table 6-33 Greenhouse Gas Emissions and Significance Criteria					
Parameter	Units	Emission Rate			
		CO_2	CH_4	N_2O	SF_6
Facility Maximum Potential Annual Operation Emissions [a]	tpy	607	0.22	0.026	0.0011 [c]
Facility Maximum Potential Annual Operation Emissions	$MTCO_2e$/ year	552	4.2	7.4	24.4 [d]
Combined GHG Annual Emissions	$MTCO_2e$/ year	588			
BAAQMD CEQA Project (Facility) Annual Significance Threshold[b]	$MTCO_2e$/ year	10,000			
Facility Annual Emissions Potentially Significant?	-	No			

[a] Excludes biogenic emissions from combustion of biogas in CHP engines and flares, following BAAQMD guidance.
[b] BAAQMD. "CEQA Air Quality Guidance," June 2010.
[c] Based on three circuit breakers, each holding 75 lbs SF_6, and a vendor (e.g., Areva – T&D) guaranteed leakage limit of 1%/yr.
[d] Includes a global warming potential of 23,900. Global warming potential is a measure of the GHG warming properties and lifetime in the atmosphere relative to CO_2. CARB. "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," December 2, 2008, http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.

The detailed GHG emission calculations for the Project are included in Appendix B.

Because GHG emissions can affect climate change only on a global basis, and the proposed project's GHG emissions are below the BAAQMD's CEQA thresholds of significance, and therefore are not substantial compared to global emissions (also compare Tables 6-33 and 1-3 or 4-4), the cumulative impact of the proposed project's GHG emissions is less than significant. Additionally, the project's emissions would be subject to regulation pursuant to AB 32; through the implementation of this statute, any remaining cumulative impacts will be mitigated.

6.6 Consistency with Laws, Ordinances, Regulations and Standards (LORS)

Project consistency with LORS at the federal, state and local district level is described below.

6.6.1 Consistency with Federal Requirements

The BAAQMD has been delegated authority by EPA to implement and enforce most federal requirements that are applicable to the Project, including new source performance

standards. Hence, compliance with District regulations assures compliance and consistency with the corresponding federal requirements.

The Project will not be required to comply with federal Acid Rain requirements (CAA Title IV) because the CHP engines will burn biogas, which is not a fossil fuel.

The federal PSD program will not apply to the Project because annual potential emissions of any criteria pollutant will not exceed 250 tons per year (40CFR52.21) and will not exceed the District thresholds to qualify as a Major Facility (Rule 2-2), as shown in Table 6-14.

6.6.2 Consistency with State Requirements

State law sets up local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. As discussed above, the Project is under the local jurisdiction of the BAAQMD, and compliance with District regulations will assure compliance with state air quality requirements.

In addition, the Project will report its GHG emissions as required by the state GHG Mandatory Reporting Program and the federal GHG Mandatory Reporting Rule.[74] The three Diesel-fueled emergency generator engines will comply with the ATCM for Stationary Compression Ignition Engines.

6.6.3 Consistency with Local Requirements: BAAQMD

The BAAQMD has been delegated responsibility for implementing local, state, and federal air quality regulations in its jurisdiction. The Project is subject to District regulations that apply to new sources of emissions, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from toxic air pollutants.

The Project is not a Major Facility, defined by BAAQMD Rule 2-1 Section 204, because annual emissions of each regulated air pollutant would be less than 100 tons per year, annual emissions of any single hazardous air pollutant would be less than 10 tons per year, and annual emissions of all combined hazardous air pollutants would be less than 25 tons per year. The following sections include the evaluation of facility compliance with the applicable District requirements.

[74] U.S. EPA. "Mandatory Greenhouse Gas Reporting," proposed for inclusion in 40 CFR Part 98, October 30, 2009 (Federal Register, Volume 74, No. 209, pp. 56374-56498.

Best Available Control Technology Requirement (Section 2-2-301)

The Project CHP engines, flares and biofilters will satisfy technologically feasible BACT, as shown in Appendix C.

Offset Requirements, Precursor Organic Compounds and Nitrogen Oxides, NSR (Section 2-2-302)

The Project will not be required to provide offsets for its emissions of criteria pollutants because the Project does not qualify as a Major Facility under District rules (i.e., 100 tpy). The Project will not require offsets for its emissions of POC or NOx because annual emissions will not be in excess of 50 tons per year.

Offset Requirement, PM_{10} and Sulfur Dioxide, NSR (Section 2-2-303)

The Project will not require offsets of PM_{10} or SO_2 emissions because the facility will not be a Major Facility (100 tons per year on a pollutant specific basis).

BAAQMD Regulation 2 – Permits, Rule 5 – New Source Review of Toxic Air Contaminants

A health risk screening analysis (HRSA) was conducted because nine toxic air contaminants would be potentially emitted from the Project with weighted annual average emission rates exceeding their chronic trigger levels in Table 2-5-1 of the rule.

If needed, the Project would apply T-BACT to each stationary source that might potentially emit carcinogenic TACs and cause a cancer rusk greater than 1.0 in one million or a chronic health hazard index greater than 0.20 at the PMI. None of the stationary sources contribute more than these thresholds.

The overall potential public health impact of the total facility will not exceed a cancer risk of 10.0 in one million, a chronic health hazard index of 1.0, or an acute health hazard index of 1.0 at the nearest residences or worker receptors.

BAAQMD Regulation 7 – Odorous Substances

Although Regulation 7 stipulates limitations only if the District receives complaints from 10 or more complainants with a 90-day period alleging objectionable odors within the property line of each complainant, the emissions of the 20 toxic air contaminants that also have odor thresholds were modeled to explicitly demonstrate that no odor would be detectable from project operation. The Project will not discharge concentrations of dimethyl sulfide, ammonia, mercaptans as methyl mercaptan, phenolic compounds as phenol, and trimethylamine in excess of the allowable limits in Table II in the regulation.

BAAQMD Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

The Project emissions of NOx and CO from its stationary internal combustion engines (ICEs), which are rated more than 50 brake horsepower (bhp), and the NOx and CO emissions from the Diesel-fueled emergency generator engines, which are rated more than 175 bhp, will not exceed the following limits in the regulation:

- Spark-ignition engines
  - NOx (as NO_2) $\leq$ 70 ppmvd[75] @ 15% oxygen (O_2)
  - CO $\leq$ 2,000 ppmvd @ 15% O_2
- Compression-ignition engines rated more than 175 bhp
  - NOx (as NO_2) $\leq$110 ppmvd @ 15% O_2
  - CO $\leq$ 310 ppmvd @ 15% O_2

BAAQMD Regulation 10 – Standards of Performance for New Stationary Sources

The Diesel-fueled emergency generator engines will comply with Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, including the requirements listed below.

- Emission limits for model year 2007 and later emergency stationary compression ignition (CI) internal combustion engines (ICEs) over the entire life of the engine.
- The Diesel fuel will meet the requirements of 40 CFR 80.510(b) for non-road Diesel fuel.
- Each engine will be equipped with a non-resettable hour meter before initial startup.

The Project's CHP engines will comply with Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, including the requirements listed below.

- Emission limits for spark ignition (SI) ICEs including lean-burn engines after January 1, 2008, with a maximum engine power $\geq$500 hp and < 1,350 hp.
- Emission limits for a lean-burn SI ICE fueled with landfill or digester gas, rated between 500 and 1,350 hp, and manufactured between January 1, 2008, and July 1, 2010, as listed below.
  - NOx (as NO_2): 220 ppmvd @ 15% O_2 or 3.0 g/hp-hr
  - CO: 610 ppmvd @ 15% O_2 or 5.0 g/hp-hr
  - VOC: 80 ppmvd @ 15% O_2 or 1.0 g/hp-hr

[75]parts per million by volume on a dry basis.

If the engines are manufactured after July 1, 2010, they will comply with the following NOx limit:

- NOx (as NO_2): 150 ppmvd @ 15% O_2 or 2.0 g/hp-hr

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7. LEVEL OF IMPACT AND DETERMINATION OF SIGNIFICANCE OF IMPACTS

Results from criteria pollutant modeling for construction and routine operation indicate that potential ambient concentrations of NO_2, CO, SO_2, and PM_{10} would not exceed ambient air quality standards, with the exception of PM_{10} and $PM_{2.5}$. For these pollutants, existing 24-hour average PM_{10} background concentrations and PM_{10} and $PM_{2.5}$ annual background concentrations already exceed state standards, but the project would not add a significant contribution to these existing exceedances. The ambient air quality standards protect public health with a margin of safety for the most sensitive subpopulations.

Results from the detailed health risk assessment based on emissions modeling indicate that there will be no significant incremental public health risks from construction or operation of the Project.

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8. MITIGATION MEASURES

No mitigation measures are needed for the Project emissions because the potential air quality and public health impacts are less than significant.

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Figures

Figure 1
Vicinity Map

Figure 2
Site Layout and Surroundings

Figure 3
Adjacent Related Facilities

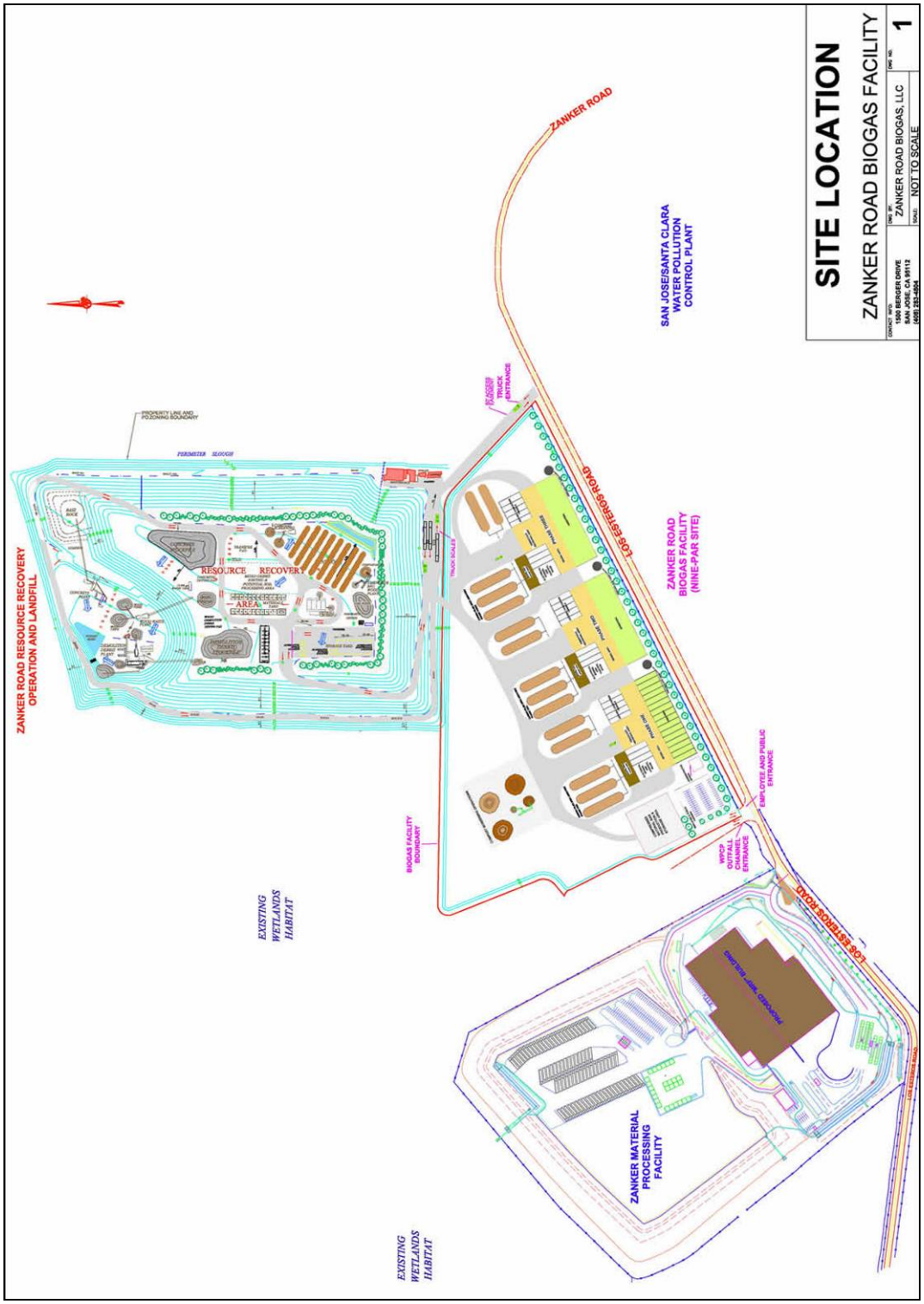


Figure 4
Nearest Sensitive Receptors Towards the West-Southwest

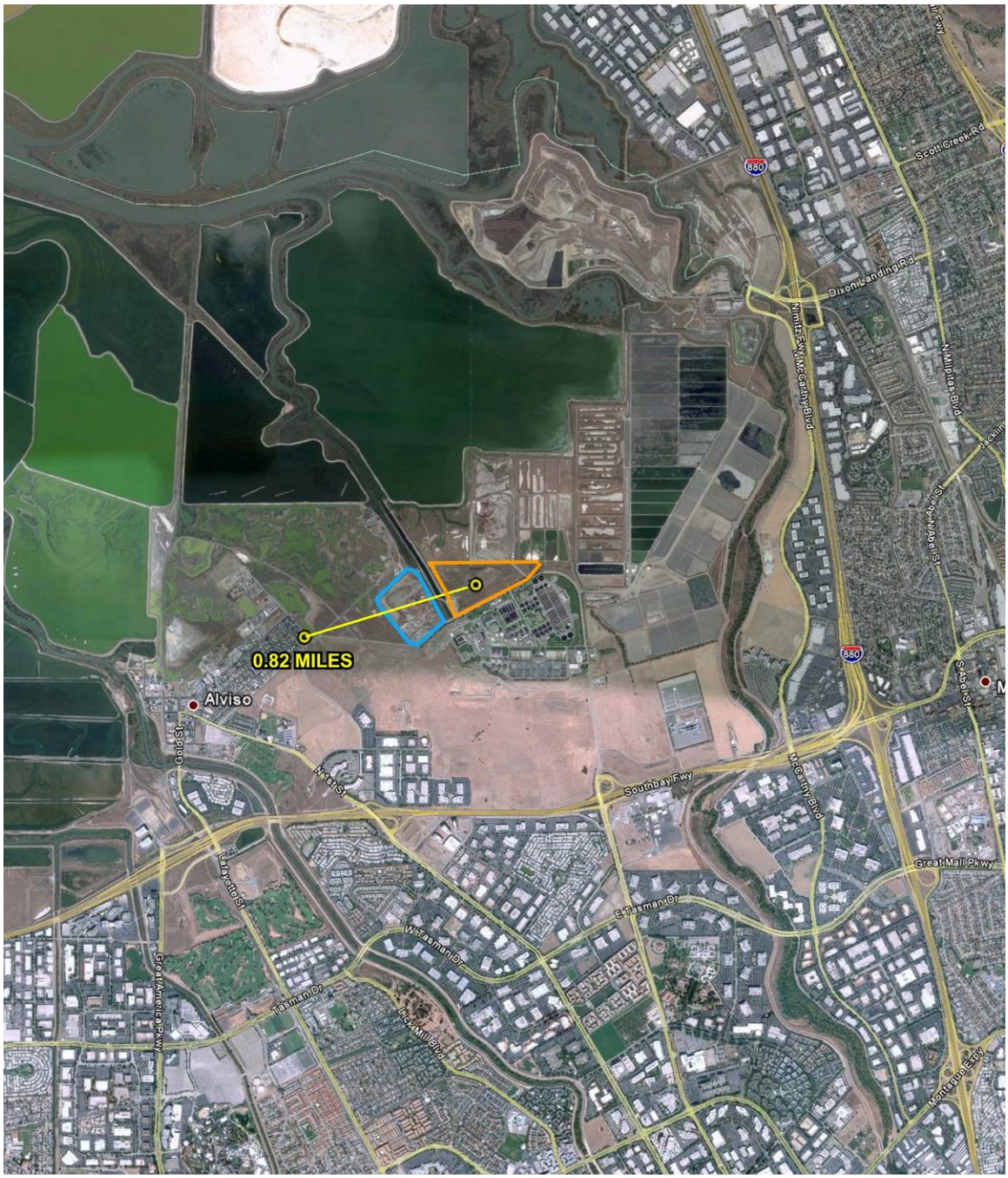


Figure 5
Nearest Sensitive Receptors Towards the South-Southwest

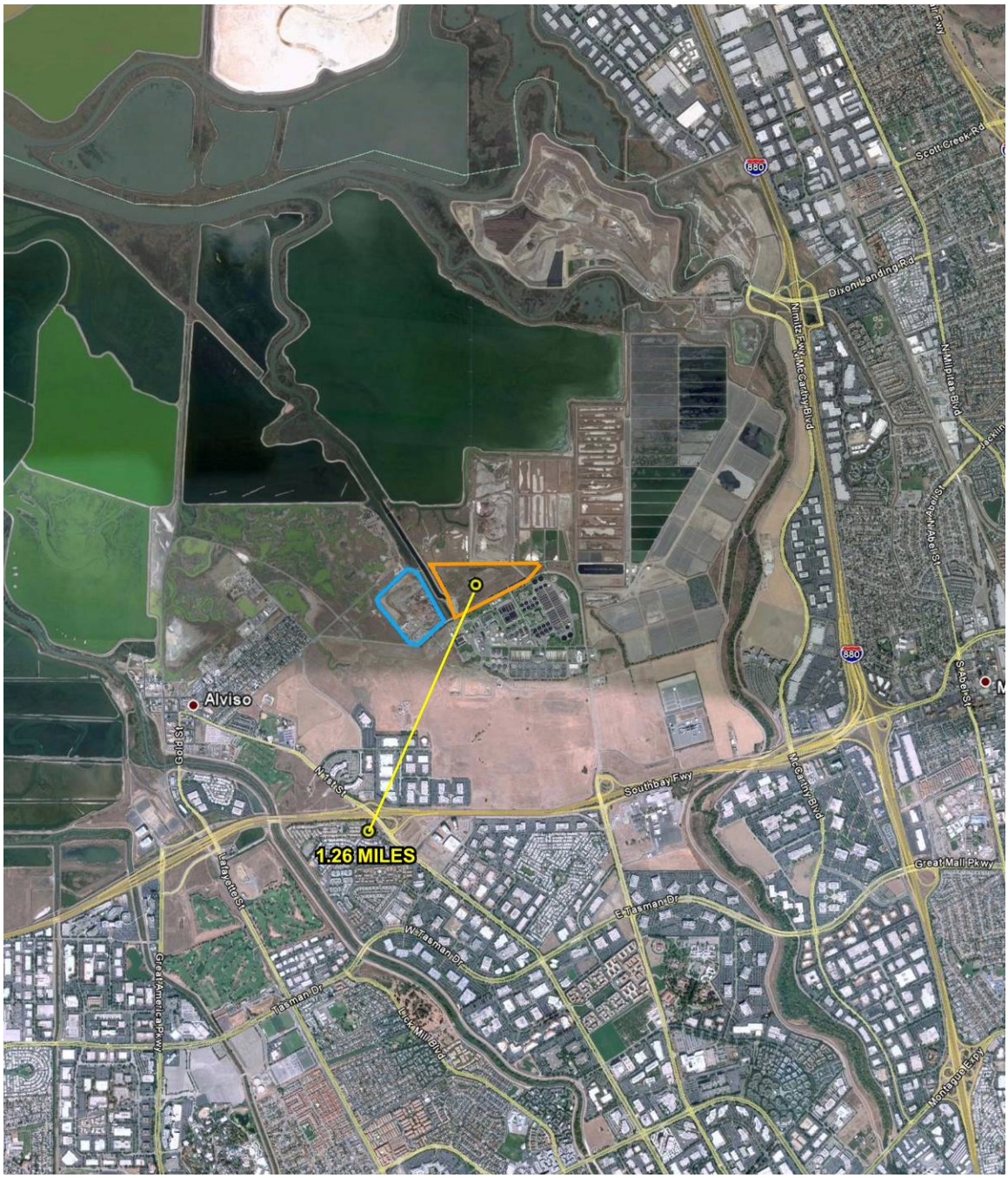


Figure 6
Nearest Sensitive Receptors Towards the South-Southeast

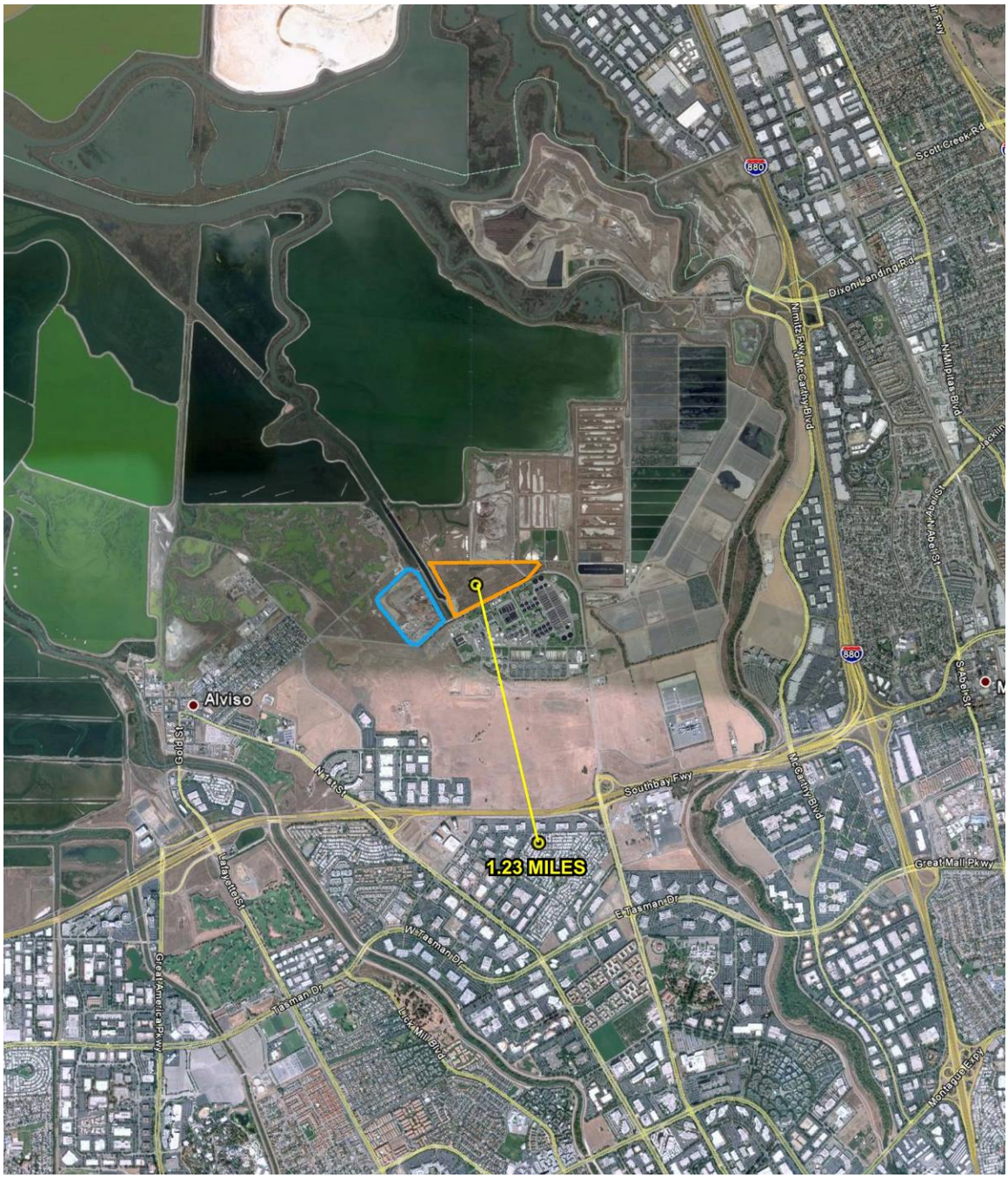


Figure 7
Nearest Sensitive Receptors Towards the East-Northeast

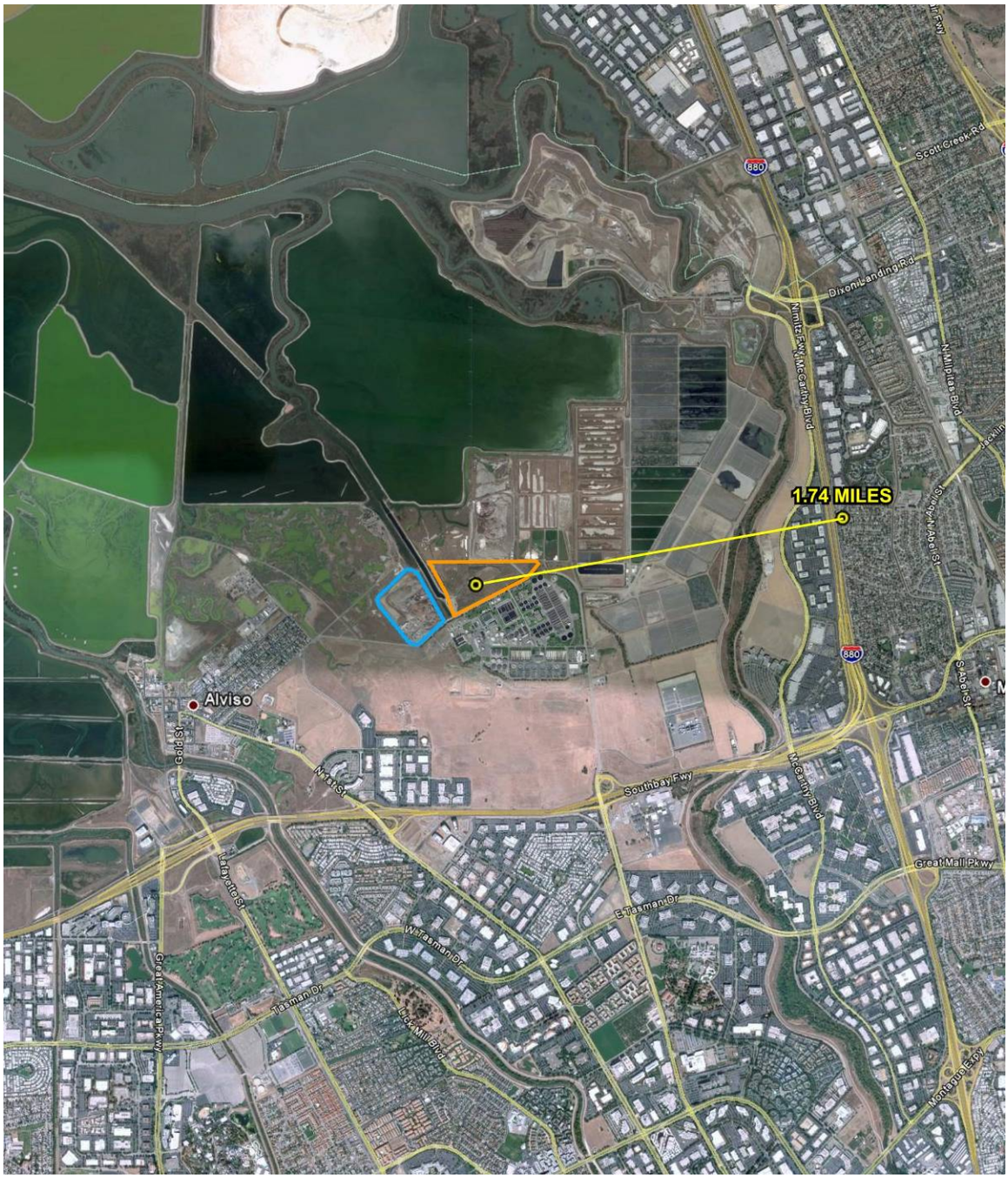


Figure 8
Winter Predominant Mean Circulation of the Surface Winds

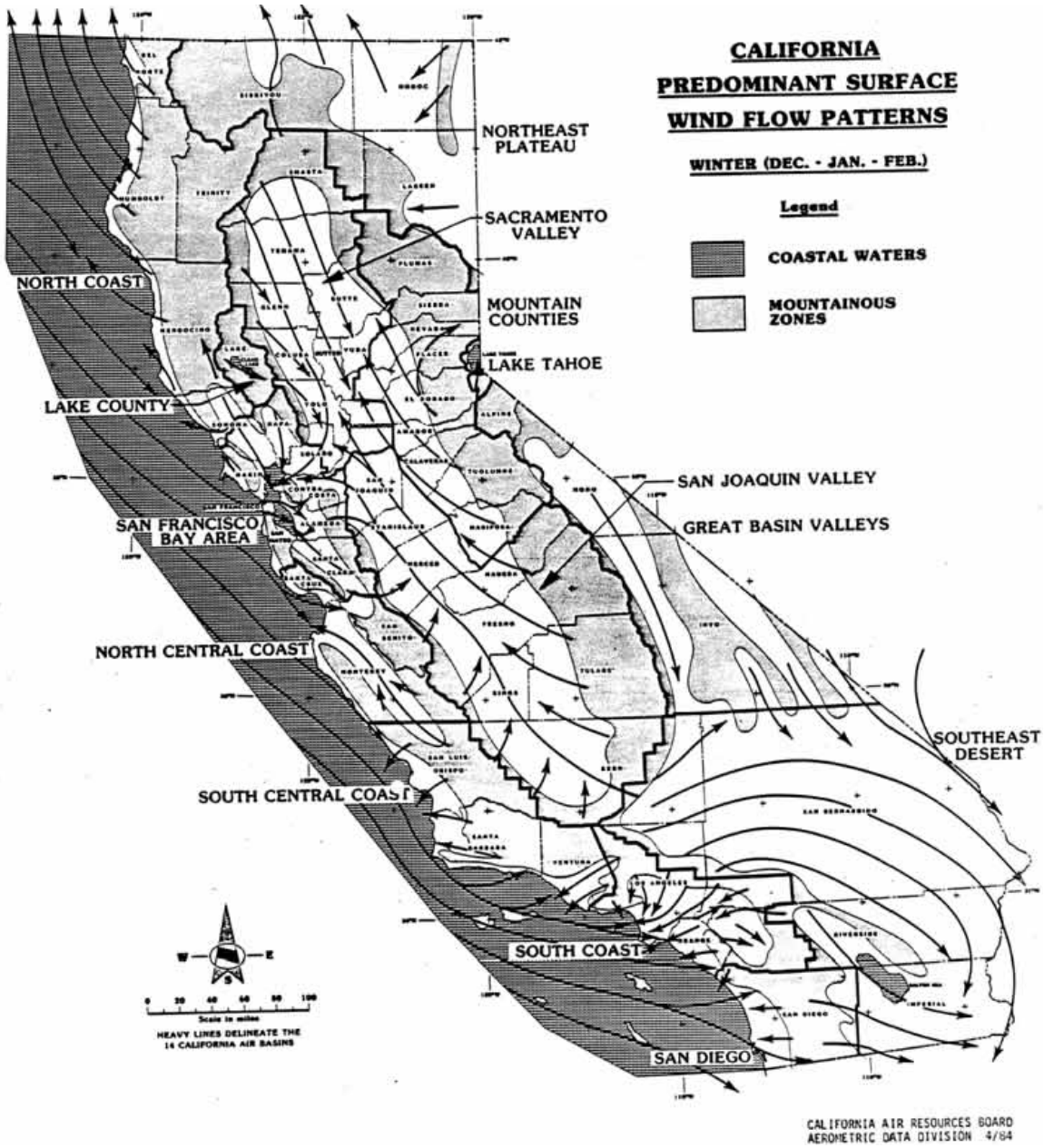


Figure 9
Spring Predominant Mean Circulation of the Surface Winds

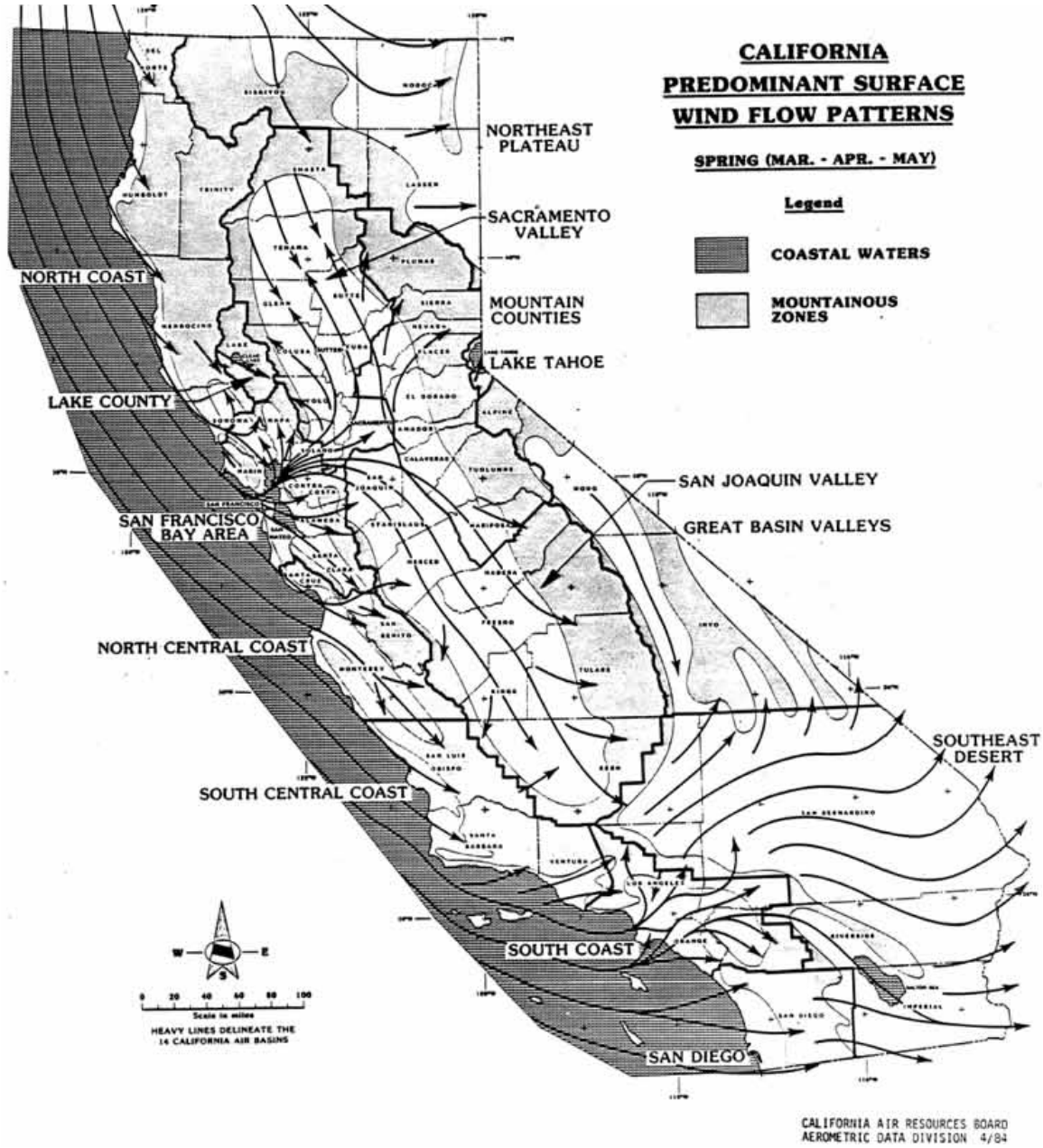


Figure 10
Summer Predominant Mean Circulation of the Surface Winds

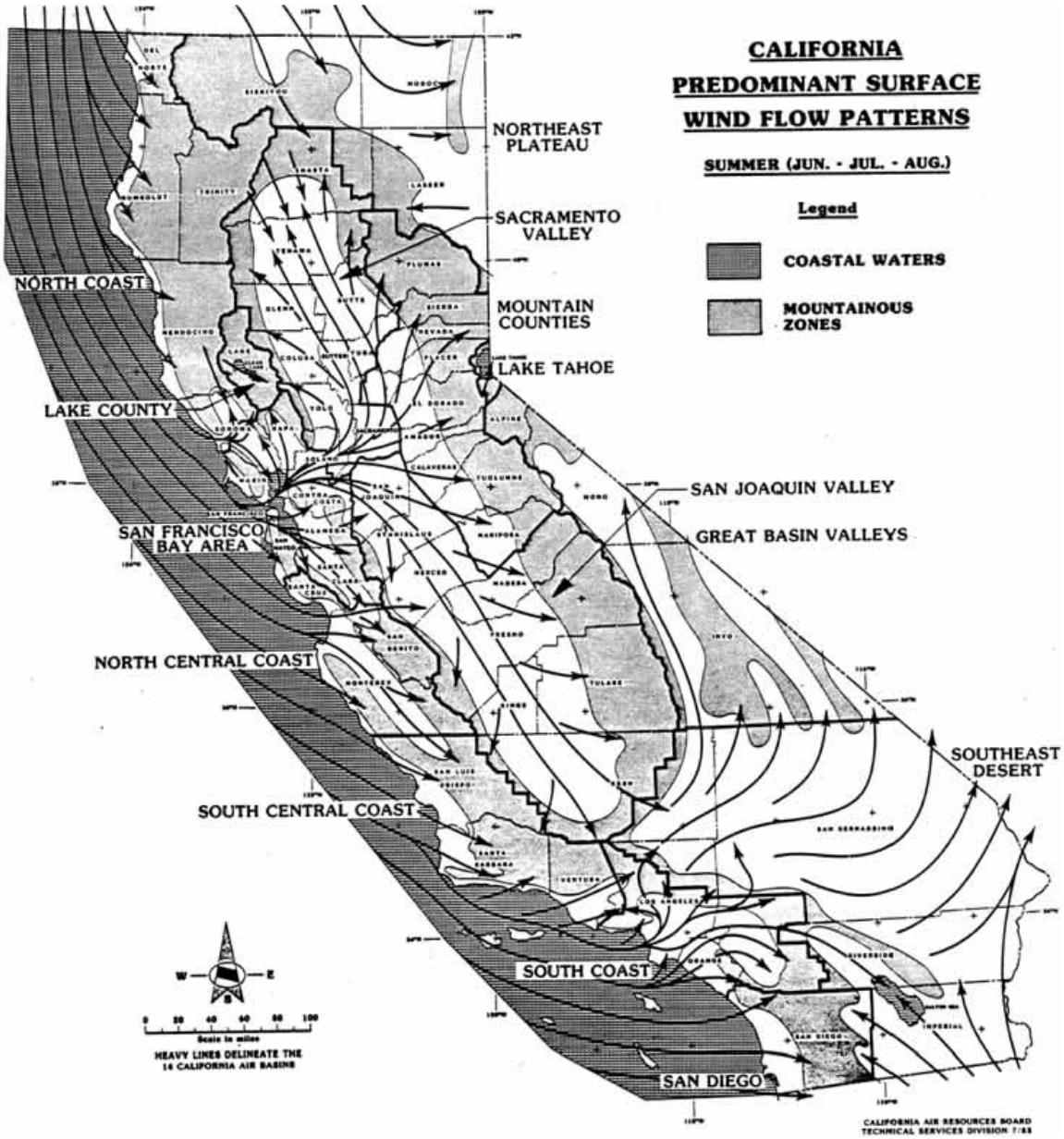


Figure 11
Fall Predominant Mean Circulation of the Surface Winds

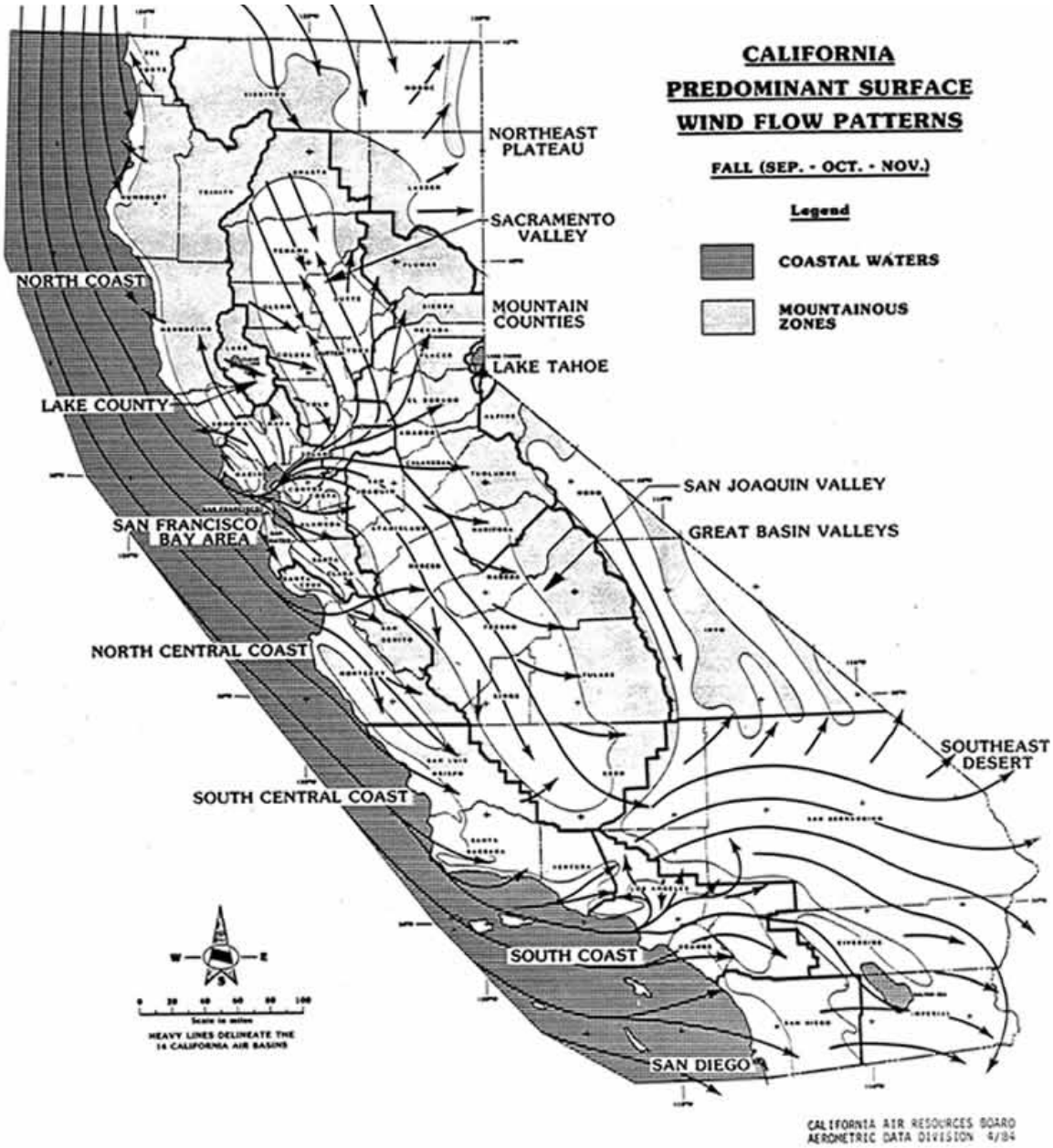
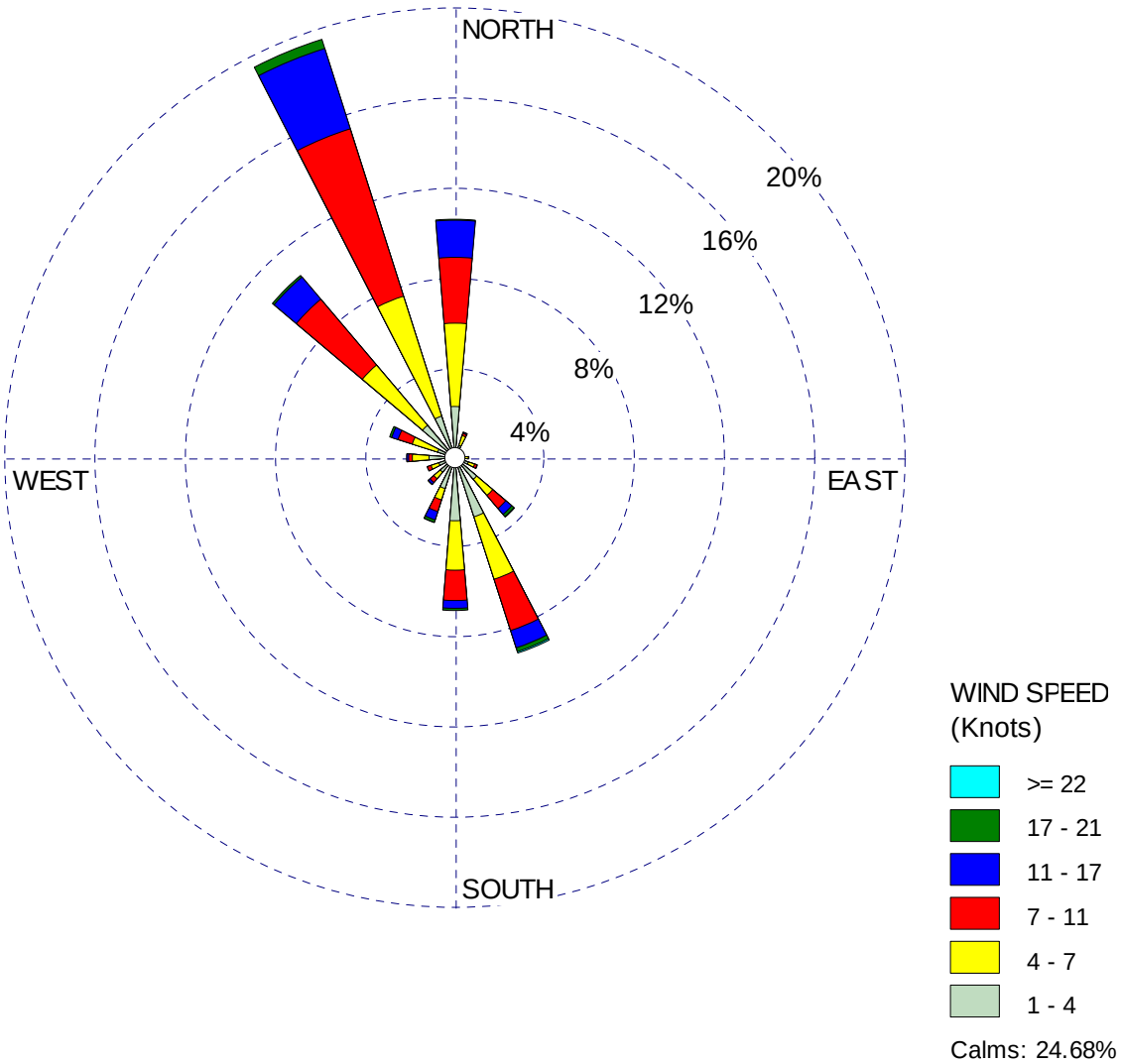
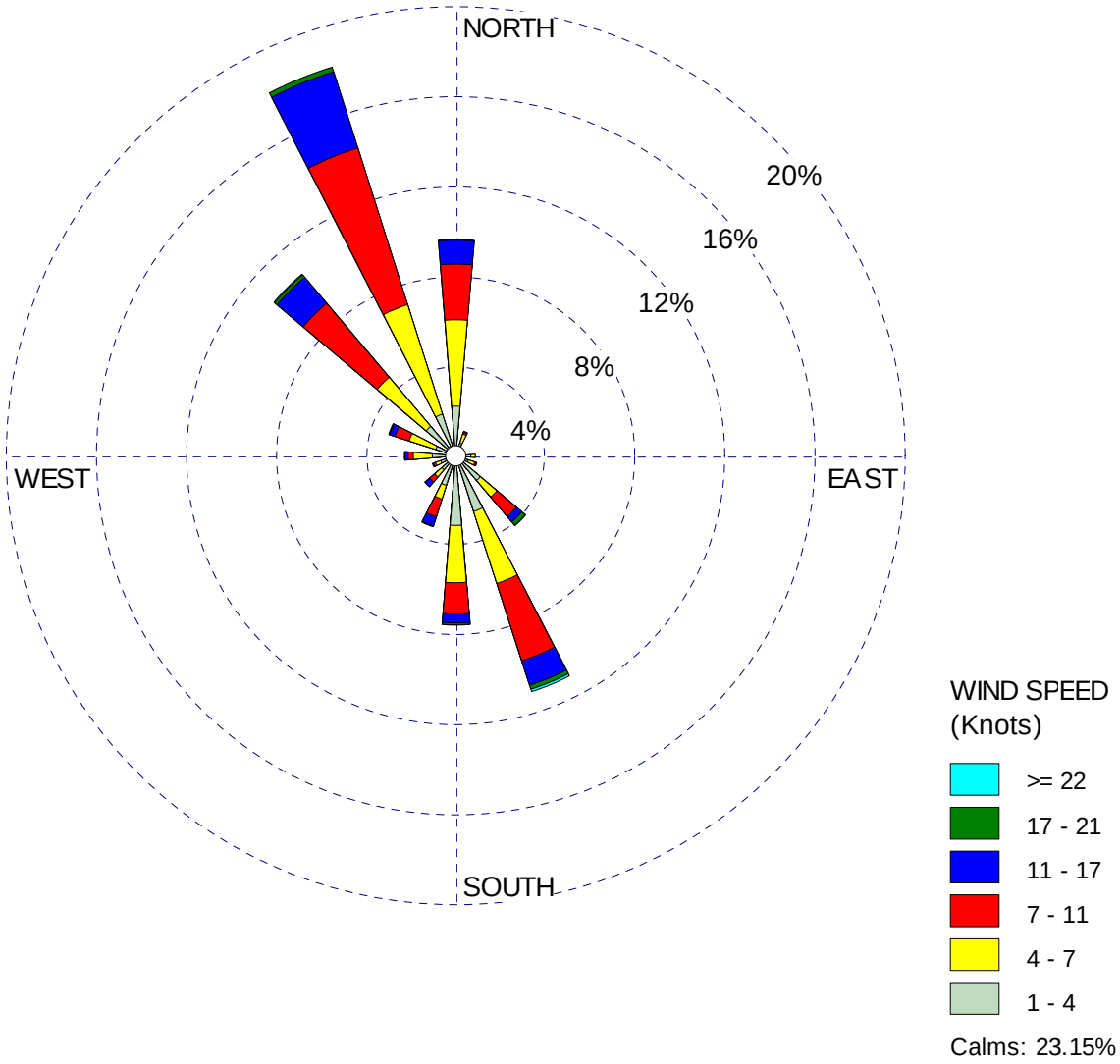


Figure 12
2005 Annual Wind Rose
San Jose International Airport, San Jose, CA



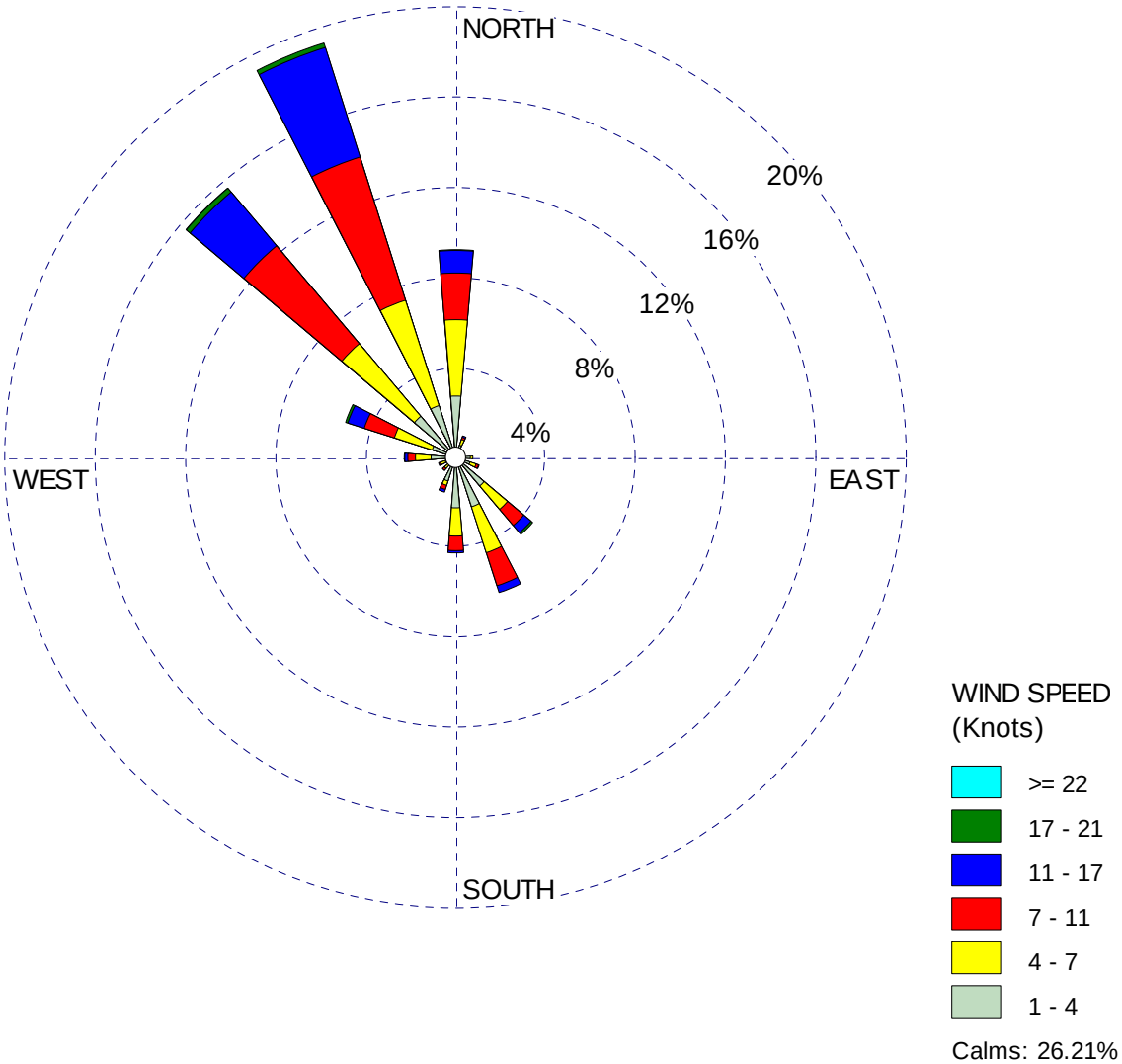
San Jose Airport – 2005 - TD3505 met data

Figure 13
2006 Annual Wind Rose
San Jose International Airport, San Jose, CA



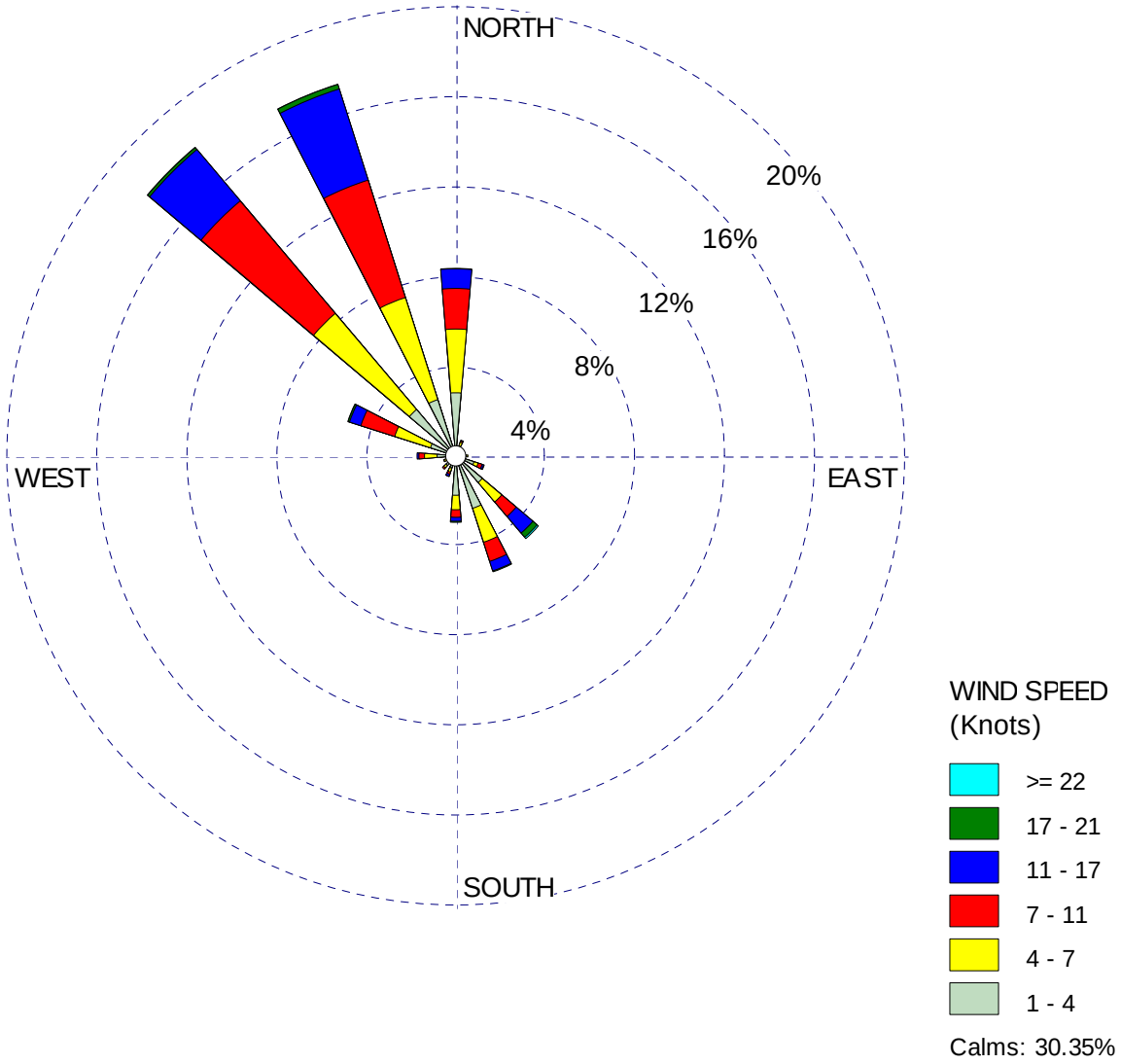
San Jose Airport – 2006 - TD3505 met data

Figure 14
2007 Annual Wind Rose
San Jose International Airport, San Jose, CA



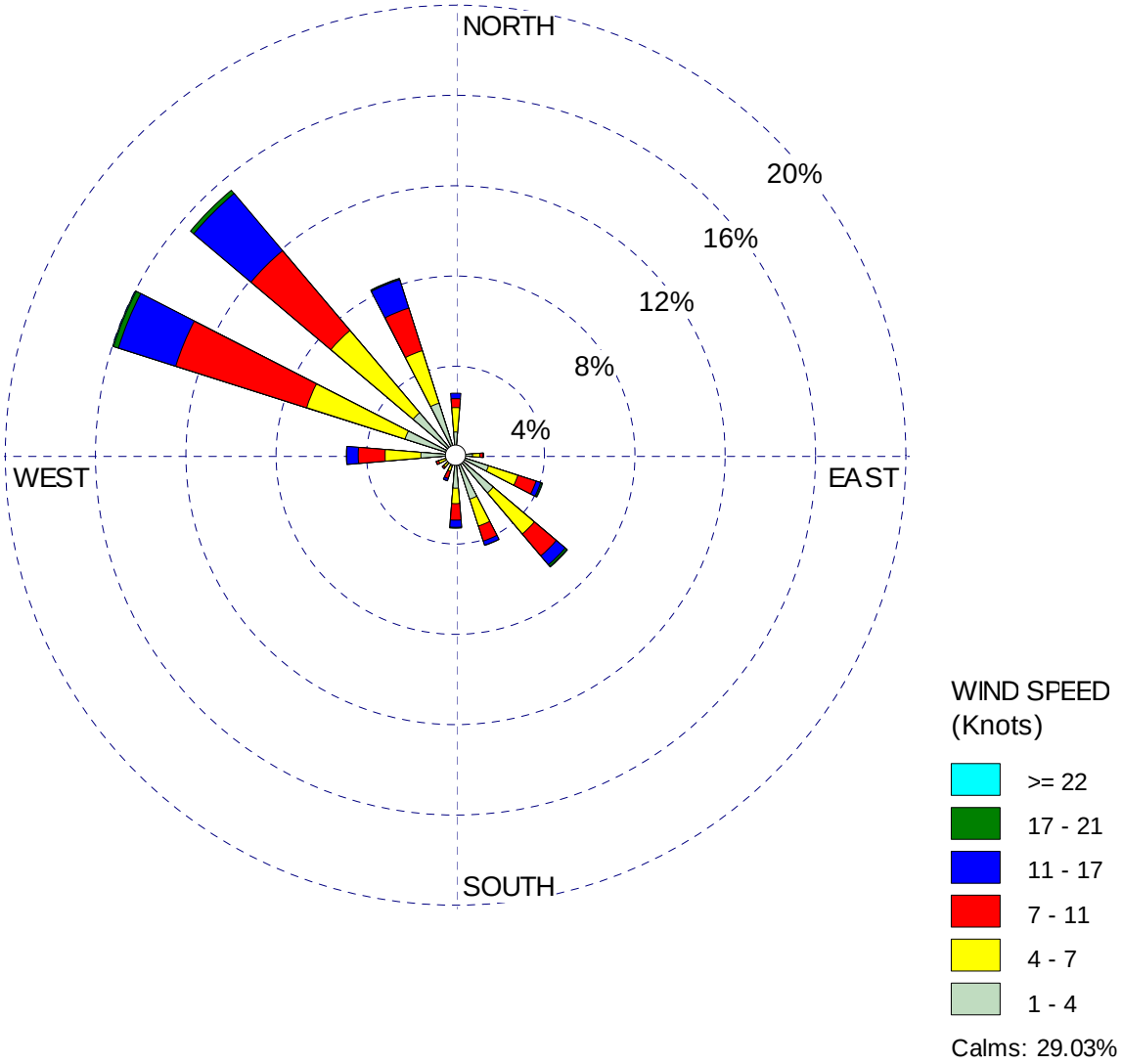
San Jose Airport – 2007 - TD3505 met data

Figure 15
2008 Annual Wind Rose
San Jose International Airport, San Jose, CA



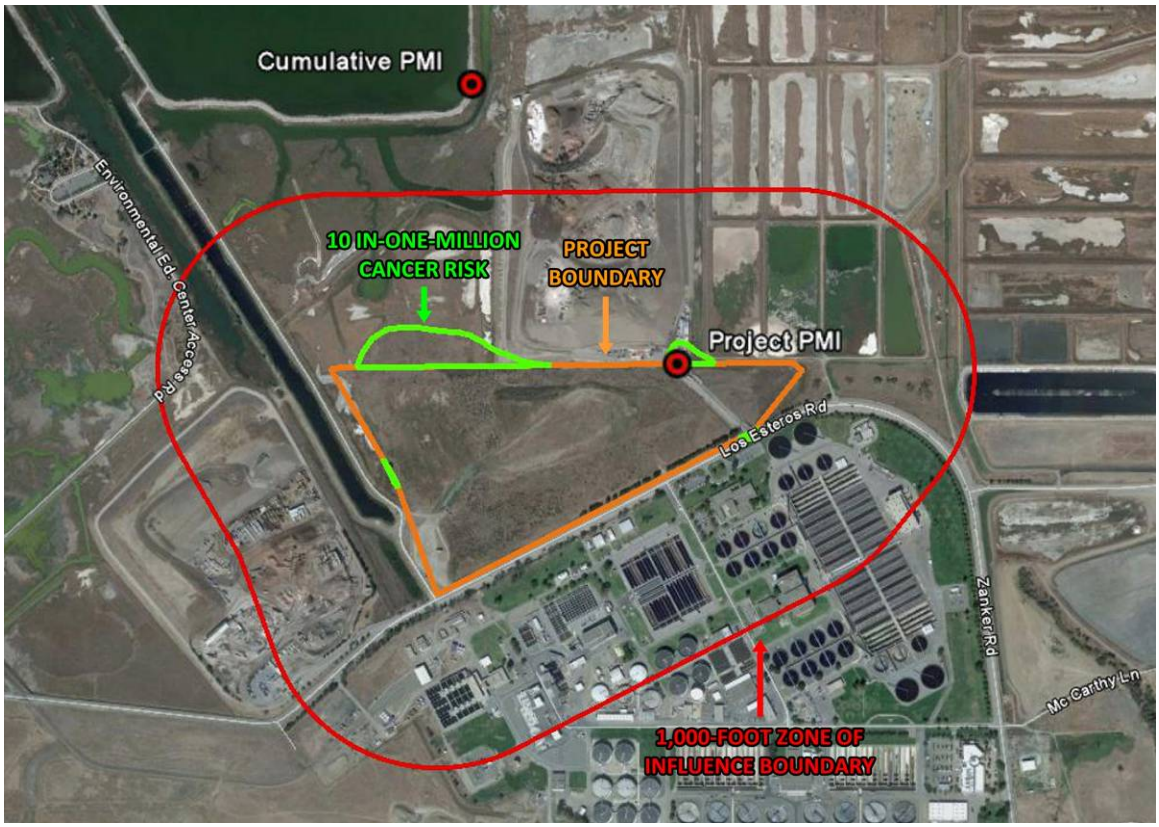
San Jose Airport – 2008 - TD3505 met data

Figure 16
2009 Annual Wind Rose
San Jose International Airport, San Jose, CA



San Jose Airport – 2009 - TD3505 met data

Figure 17
Health Risk Assessment Points of Maximum Impact and 1,000 ft Zone of Influence



Appendix A
Sensitive Receptors

Table A-1
Preschool/Daycare Sensitive Receptors
Dry Fermentation Anaerobic Digestion Facility

Preschool/Daycare Name	X (Lat.)	Y(Long.)	UTM X	UTMY	Street Address	City/State	Phone	Distance (mi.)
Saint-Thomas Catholic School	37.431829°	-121.914367°	596047.78	4143338.72	200 North Abbott Avenue	Milpitas, CA	(408) 946-0190	2.0 mi E
Day Star Montessori School	37.431329°	-121.885522°	598600.46	4143315.28	215 Dempsey Road	Milpitas, CA	(408) 263-1618	3.6 mi E
Milpitas Montessori School	37.427722°	-121.876451°	599407.87	4142917.89	1500 Yosemite Drive	Milpitas, CA	(408) 941-7865	4.1 mi E
Small World Academy	37.392467°	-121.998645°	588639.97	4138890.28	878 Lakewood Drive	Sunnyvale, CA	(408) 737-7022	3.9 mi SW
Jais Montessori Children	37.477296°	-121.920514°	595446.11	4148376.02	270 McDuff Avenue	Fremont, CA	(510) 498-8839	3.4 mi NE
Calaveras Montessori School	37.435876°	-121.883367°	598786.49	4143817.76	1331 East Calaveras Boulevard	Milpitas, CA	(408) 945-1331	3.7 E
Jacklin Commons KinderCare	37.445847°	-121.893037°	597915.52	4144918.15	860 North Hillview Drive	Milpitas, CA	(408) 263-0444	3.3 mi E
Montessori Children Center	37.487422°	-121.925231°	595016.17	4149500.06	209 East Warren Common	Fremont, CA	(510) 490-1343	3.9 mi N
Sunshine Kids Pre School	37.476279°	-121.921599°	595352.68	4148342.63	47832 Warm Springs Boulevard	Fremont, CA	(510) 445-0222	3.3 mi NE
Mayne Preschool	37.423786°	-121.967195°	591387.05	4142390.53	5030 North 1st Street	Alviso, CA	(408) 423-1714	1.2 mi SW
Elan Esprit Preschool	37.430285°	-121.905900°	596798.9	4143174.96	40 East Carlo Street	Milpitas, CA	(408) 262-3848	2.5 mi E
Milpitas KinderCare	37.424404°	-121.906630°	596744.04	4142529.61	400 South Abel Street	Milpitas, CA	(408) 263-7212	2.5 mi E
Golden Harvest Montessori School	37.458173°	-121.912027°	596222.18	4146265.03	1905 North Milpitas Boulevard	Milpitas, CA	(408) 719-1686	2.7 mi NE
Merryhill School: Milpitas 2 Yrs - Pre-K	37.424693°	-121.907889°	596630.08	4142554.75	123 Corning Avenue	Milpitas, CA	(408) 922-9823	2.5 mi E
Achieving Stars Academy	37.425865°	-121.913805°	596104.07	4142671.99	301 South Abbott Avenue	Milpitas, CA	(408) 263-8802	2.1 mi E
Crescent Montessori Preschool	37.454672°	-121.910958°	596321.34	4145866.49	1651 North Milpitas Boulevard	Milpitas, CA	(408) 821-0109	2.6 mi NE
Hands On Learning Center	37.421573°	-121.904900°	596898.54	4142215.03	637 South Main Street	Milpitas, CA	(408) 946-5622	2.7 mi E
Heads Up Child Development Center	37.396090°	-121.927364°	594942.97	4139361.57	2841 Junction Avenue	San Jose, CA	(408) 432-1644	3.0 mi SE
Milpitas Parents Pre-School	37.459992°	-121.905995°	596755.69	4146462.96	355 Dixon Road	Milpitas, CA	(408) 263-3950	3.0 mi NE
Knowledge Preschool	37.392872°	-121.962473°	591841.45	4138968.69	2192 Hunter Place	Santa Clara, CA	(408) 727-6764	3.0 mi S
AppleTree Educational, LLC	37.406187°	-121.988576°	589516.04	4140426.45	1257 Reamwood Avenue	Sunnyvale, CA	(408) 470-4888	2.9 mi SW
Sunnyhills Child Care-Dev Center	37.459640°	-121.905086°	596834.2	4146432.66	356 Dixon Road	Milpitas, CA	(408) 945-5577	3.0 mi NE

Source: Google Earth and Google Maps

Table A-2
School (K-12) Sensitive Receptors
Dry Fermentation Anaerobic Digestion Facility

School Name	X (Lat.)	Y(Long.)	UTM X	UTMY	Street Address	City/State	Phone	Distance (mi.)
Downtown College Prep Alviso School	37.424803°	-121.975853°	590616.28	4142502.81	1621 Gold Street	Alviso, CA	(408) 942-7000	1.5 mi SW
Anthony Spangler Elementary School	37.430552°	-121.913320°	596143.25	4143191.4	140 North Abbott Avenue	Milpitas, CA	(408) 945-5592	2.1 mi E
Kathryn Hughes Elementary School	37.405743°	-121.962864°	591787.68	4140402.98	4949 Calle De Escuela	Santa Clara, CA	(408) 988-2390	2.1 mi S
Curtner Elementary School	37.440036°	-121.912698°	596186.08	4144249.86	275 Redwood Avenue	Milpitas, CA	(408) 635-2852	2.1 mi E
Don Callejon School	37.398473°	-121.946408°	593253.19	4139606.95	4176 Lick Mill Boulevard	Santa Clara, CA	(408) 423-3300	2.5 mi S
Milpitas High School	37.450937°	-121.900048°	597290.96	4145419	1285 Escuela Parkway	Milpitas, CA	(408) 635-2800	3.0 mi E
St. John the Baptist Catholic School	37.425676°	-121.907546°	596658.7	4142659.1	360 South Abel Street	Milpitas, CA	(408) 262-8110	2.4 mi E
Thomas Russell Junior High School	37.453977°	-121.900971°	597205.52	4145804.12	1500 Escuela Parkway	Milpitas, CA	(408) 635-2864	3.0 mi NE
Marshall Pomeroy Elementary School	37.453455°	-121.903051°	597019.98	4145742.91	1505 Escuela Parkway	Milpitas, CA	(408) 945-2424	2.9 mi NE
Montague Elementary Schools	37.389379°	-121.945821°	593317.61	4138592.99	750 Laurie Avenue	Santa Clara, CA	(408) 988-3052	3.2 mi S
Milpitas Grammar School	37.432835°	-121.906774°	596719.63	4143437.94	160 North Main Street	Milpitas, CA	(408) 262-1171	2.4 mi E
Warm Springs Elementary Schools	37.482680°	-121.923262°	595194.98	4148989.37	47370 Warm Springs Boulevard	Fremont, CA	(510) 656-1611	3.6 mi NE
Fairwood Elementary School	37.396126°	-121.991294°	589284.14	4139298.65	1110 Fairwood Avenue	Sunnyvale, CA	(408) 523-4870	3.5 mi SW
First Years Child Care Center Inc	37.410599°	-121.901639°	597203.75	4140981.83	1400 South Main Street	Milpitas, CA	(408) 934-0581	3.2 mi SE
Alexander Rose Elementary School	37.432495°	-121.875917°	599449.93	4143448.02	250 Roswell Drive	Milpitas, CA	(408) 635-2668	4.1 mi E
Robert Randall Elementary School	37.429316°	-121.880982°	599005.93	4143095.59	1300 Edsel Drive	Milpitas, CA	(408) 635-2662	3.9 mi E
Joseph Weller Elementary School	37.458327°	-121.905854°	596766.82	4146288.42	345 Boulder Street	Milpitas, CA	(408) 635-2876	3.0 mi NE
Granada Islamic School	37.377144°	-121.959632°	592107.64	4137228.71	3003 Scott Boulevard	Santa Clara, CA	(408) 980-1161	4.0 mi S
Northwood Elementary School	37.408705°	-121.881189°	599016.99	4140809.8	2760 E Trimble Rd	San Jose, CA	(408) 923-1940	4.2 mi SE
Lakewood Elementary School	37.398372°	-122.002786°	588263.13	4139539.25	750 Lakechime Drive	Sunnyvale, CA	(408) 522-8272	3.9 mi SW
Pearl Zanker Elementary School	37.407659°	-121.905835°	596832.64	4140665.86	1585 Fallen Leaf Drive	Milpitas, CA	(408) 635-2882	3.1 mi SE
James Leitch Elementary School	37.486954°	-121.923434°	595172.36	4149440.95	47100 Fernald Street	Fremont, CA	(510) 657-6100	3.9 mi NE
Calaveras Hills High School	37.435876°	-121.883367°	598786.49	4143817.76	1331 East Calaveras Boulevard	Milpitas, CA	(408) 635-2690	3.7 mi E

Source: Google Earth and Google Maps

Table A-3
Elder Care Facility Sensitive Receptors
Dry Fermentation Anaerobic Digestion Facility

Elder Care Facility Name	X (Lat.)	Y(Long.)	UTM X	UTMY	Street Address	City/State	Phone	Distance (mi.)
Valley House Rehabilitation Center	37.389709°	-121.951718°	592792.94	4138622.64	991 Clyde Avenue	Santa Clara, CA	(408) 988-7667	3.1 mi S
PRN Physical Therapy Hand & Rehabilitation Centers	37.432804°	-121.896522°	597627.65	4143460.77	660 East Calaveras Boulevard	Milpitas, CA	(408) 570-0510	3.0 mi E

Source: Google Earth and Google Maps

Table A-4
Closest Residences
Dry Fermentation Anaerobic Digestion Facility

Nearest Residence	X (Lat.)	Y(Long.)	UTM X	UTMY	Street Address	City/State/Zip	Distance (mi.)
SSE	37.417807	-121.942418	593495.0	4141747.0	301-399 Los Encinos Ct	San Jose, CA 95134	1.17
ENE	37.435169	-121.918396	595687.0	4143696.0	626 Heath Street	Milpitas, CA 95035	1.77
SSW	37.418473	-121.959954	592032.0	4141803.0	4271 N 1st St	San Jose, CA 95134	1.15
WSW	37.431253	-121.965107	591559.0	4143223.2	1583 Michigan Ave	San Jose, CA 95002	0.70

Source: Google Earth and Google Maps

Table A-5
Closest Hospitals and Medical Clinics
Dry Fermentation Anaerobic Digestion Facility Project

Nearest Hospitals/ Clinics	X (Lat.)	Y(Long.)	UTM X	UTMY	Street Address	City/State/Zip	Distance (mi.)
Kaiser Permanente Medical	37.423772	-121.894032	597857	4142459	611 South Milpitas Boulevard	Milpitas, CA 95035-5473	3.2
China Hospitals	37.370904	-121.919006	595715	4136567	50 Airport Parkway	San Jose, CA 95110-1036	4.7
Mc Carthy Medical Center	37.428358	-121.920063	595548	4142941	246 Ranch Drive	Milpitas, CA 95035-5107	1.5

Source: Google Earth and Google Maps

Appendix B
Operating Parameters and Emissions of Criteria Pollutants and Greenhouse Gases

Table B-1
Assumptions for Operation Emission Analysis
Dry Fermentation Anaerobic Digestion Facility Project

No.	Assumption	Units	Value	Reference
Phase 1 Construction Activity 1: Import of fill and Rough Grading				
1	Volume of soil to be imported and graded	cubic yards	100,000	Zero Waste; changed from 140,000 per July 6, 2010 email from DJP&A. 40,000 cy will be on site at start of project.
2	Soil haul truck capacity	tons	45	Generic capacity
3	Soil density	tons/cy	1.5	Generic density
4	Soil haul truck capacity	cubic yards	30	Generic capacity
5	Number of soil fill delivery/rough grading days	days	**36**	Six 6-day weeks per DJP&A email at 9:38 AM on July 6, 2010.
6	Number of soil fill delivery/rough grading weeks (@6 days e	weeks	6	Calculated
7	Rough grading rate	cy/day	2,778	Calculated average
8	Rough grading rate	cy/week	16,667	Calculated
9	Number of construction work hours per week	hrs/week	68	Calculated
10	Rough grading rate	cy/hr	245	Calculated for 68 hour work week
11	Number of soil haul trucks delivering per hour	/hr	8.2	Calculated
12	Number of soil haul truck deliveries per 12-hour day	/day	**99**	Calculated for maximum day
13	Rate of arrival of haul trucks	minutes/truc k	7.3	Calculated
14	Length of rough grading work week	days/week	6	M-F are 12 hour construction days, but Sat is only 8 hrs.
15	Length of work month	days/month	**25**	Assume 10 holidays per year.
16	Area to be rough graded	acres	41	Project description
17	Equipment used in rough grading	--	4 tandem dump trucks, 2 scrapers (Cat 637G), 1 dozer (D8R), 1 boom truck and 1 water truck.	
18	Running time for each of the 4 dump trucks in 12-hour day	hours	2.6	
Operation Assumptions				
19	Total mass of amendment material needed	tons/year	45,000	Zero Waste
20	Mass of amendment material hauled from Zanker Landfill	tons/year	22,500	Zero Waste
21	Density of amendment material as green waste	tons/cu.yd.	0.31	Westlake Farms Application to the SJVAPCD
22	Capacity of trucks hauling amendment material	cubic yards	39	Calculated from density (No.15) and truck capacity (No. 17). Seems large.
23	Capacity of trucks hauling amendment material	tons	12	Emily Hanson July 2, 2010 email
24	Number of haul trucks delivering amendment material per da	/day	13	Calculated
25	Mass of organic material to be hauled	tons/year	225,000	Zero Waste
26	Capacity of large volume transfer trucks hauling organic mat	tons	20	Simi Valley Landfill and Recycling Facility
27	Number of large volume transfer trucks hauling organic mate	per day	105	Hexagon Transportation Consultants, Inc.
28	Capacity of collection route trucks hauling organic material	tons	7.75	Simi Valley Landfill and Recycling Facility
29	Number of collection route trucks hauling organic material	per day	45	Hexagon Transportation Consultants, Inc.
30	Daily amount of compost raw materials processed	per day	865.4	Calculated
31	Volume of composting tunnels (per phase) occupied by comp	cubic yards	2,560	July 14, 2010 email from DJP&A
32	VOC emission factor for co-compost piles venting through a biofilter during the active phase	lbVOC/hr/yd^3	1.93E-04	SJVAPCD. *Authority to Construct Application Review, Westlake Farms Co-Composting, p.23*, 2007, citing *Emissions Evaluation of ASP Composting of Anaerobically-Digested Biosolids at the Davenport Composting Facility*, December 2003 and corrected by Tom Card,
33	VOC emission factor for co-compost piles venting during curing through a biofilter	lbVOC/hr/yd^3	9.58E-05	Id.
34	NH_3 emission factor for co-compost piles venting through a biofilter during both active and curing phases	lbVOC/hr/yd^3	1.97E-04	Id.
35	Operating days per year	days	365	"Normal" year, consistent with 8,760 hours.
36	Total number of base-loaded CHP engines	-	4	Based on Emily Hanson's October 21, 2010 email to Eric Hebert at 2:44 PM. Six egnines installed that handle the equivalent of 4 base-loaded engines.
37	CHP engine stack height	feet AGL	45	Initial height increased 50% to reduce impacts.
38	Construction workers during soil filling	number	12	Equal to heavy-duty equipment operators plus three.
39	Number of workers during Phase 1 construction	number	45	Equal to heavy-duty equipment operators plus three.
40	One-way distance traveled by employees, contruction workers, and delivery trucks to entrance	miles	25	South Bay area has a large worker population from which to draw the needed employees and construction workers.
41	Wind blown dust area			Assumed to decrease 10% per month after month 3.
42	Daily hours front-end loader engines operate	hours/day	8	Zero Waste; spread over 10 hours facility open for incoming and outgoing trucks.
43	Daily hours facility is open for incoming and outgoing mater	hours/day	10	8 AM - 6 PM according to Zero Waste
44	Number of employees	-	26	(a)
45	Number of daily visitors	-	10	

Hexagon Transportation Consultants, Inc. *Trip Generation and Operations Analyses for the Proposed Anaerobic Digestion Facility on the Nine Par Site in San Jose, California, memorandum to Julie Mier at David J. Powers & Associates, May 27, 2010.*

Table B-2
Biogas-Fueled CHP Engine Specifications
Dry Fermentation Anaerobic Digestion Facility

Engine Parameter	Units	Value	Reference
Manufacturer		MWM	
Model		TCG2016 V12 C	
Capacity	ekW	600	2G-Cenergy Quote 0.721 ekW/bhp
Brake Horsepower	bhp	832	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
Fuel		Biogas	
Fuel Consumption (LHV), thermal lin	Btu (LHV)/hr	4,951,000	2G-Cenergy Quote 5,498,830 Btu(HHV)/hr
Fuel Consumption, volume flow limit	scfm	**151**	Calculated from engine thermal limit
Fuel Consumption, volume flow limit	scfh	9,074	Calculated from engine thermal limit
			Parameters for Modeling
Exhaust Flow	acfm	2,407	1.136 m^3/s, calculated
	scfm	1,657	2G-Cenergy Quote 99,411scfh
	wet kg/hr	3,312	MWM Brochure and 2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
	wet lbs/hr	7,286	MWM Brochure and 2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
Exhaust Temperature (from MWM)	°F	310	427.4 deg K
	°C	154.4	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
Exhaust Pipe Diameter	in	10	0.254 m
Number of Exhaust Pipes		1	22.42 m/s, calculated
Exhaust Stack Height	ft	45	13.716 m, increased 50% over standard height
Operating Profile			**Reference**
Annual operation	hrs	8,640	Continuous operation except for 5 days maintenance outage.
Stack Velocity	ft/sec	73.56	Calculated
Emissions			
NOx	mg/Nm^3	500	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
	g/bhp-hr	0.95	Calculated from mg/Nm^3 (see Worksheet "EngineEmissionConversions".
CO	mg/Nm^3	600	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
	g/bhp-hr	1.14	Calculated from mg/Nm^3 (see Worksheet "EngineEmissionConversions".
POC/NMHC	mg/Nm^3	150	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
	g/bhp-hr	0.29	2G-Cenergy Quote 2010-0173REV9-9-10-BG-Zero Waste Energy,LLC
SO_2	mg/Nm^3		
	g/bhp-hr	0.197	
$PM_{10}/PM_{2.5}$	lbs/MMBtu	0.006	Garrett Smith of Cogentech via Zero Waste
	g/bhp-hr	0.018	
	gr/scf	0.00232	
NOx	lb/hr	1.74	
CO	lb/hr	2.09	
POC/NMHC	lb/hr	0.53	
$PM_{10}/PM_{2.5}$	lb/hr	0.033	
SO_2	lb/hr	0.36	
SO_2	gr S/dscf digester gas	0.14	BACT based on 80% removal of H_2S
SO_2	lb/MMBtu (HHV)	0.066	
Exhaust oxygen level	%	0.027	
CO_2 (1)	lb/hr	1,259	
CH_4 (1)	lb/hr	0.011	
N_2O (1)	lb/hr	0.0012	

1) Calculated in Table B-2.

Table B-3
Biogas-Fueled Engine Specifications and Emissions after BACT
Dry Fermentation Anaerobic Digestion Facility Project

Value	Parameter										
600	ekW output(1) MWM TCG2016 V12 C(1)			Stack Data		Sulfur Control					
1.387	bhp/ekW =	0.721	ekW/bhp	310	ºF(1)	Biogas H_2S	69.6	grains S/100scf biogas =	1,200	ppmv	
4	Number of engines(2)			0.8	ft diameter (2)	Emission(3)	13.9	grains S/100scf biogas =	240	ppmv	
832	bhp each(1)			45.0	ft height(2)	Required Control Efficiency	**80%**				
24	hours/day(2)			2,407	acfm						
8,640	hours/year(15)	scfy =	78,397,697	73.6	ft/s						
151.23	scfm fuel flow	fuel flow =	9,074 scfh	22.4	m/s						
606.0	Btu/scf, HHV biogas			50	mph						
6,609	Btu(HHV)/bhp-hr		5.499 MMBtu/hr								

Pollutant	Emission Factor				Maximum Emission Rate								Control System Efficiency (%)
	mg/Nm³ (16)	**ppmv @ 2.7% O_2**	**lb/MMBtu**	**g/bhp-hr**	**lb/hr 1 engine)**	**lb/day (1 engine)**	**lb/day (all engines)**	**tons/yr**	**g/hr**	**tpy (all engines)**	**MMtons/ yr (all engines) (4)**	**MMtons CO_2e/yr (all engines) (5)**	
NO_x(6)	50	28.0	0.032	0.095	0.174	4.18	16.7	0.8	79	**3.0**	-	-	**90%**
CO(7)	600	551.1	0.380	1.14	2.091	50.19	200.8	9.0	949	**36.1**	-	-	**0%**
POC(8)	112.5	160.2	0.073	0.22	0.399	9.57	38.3	1.7	181	**6.9**	-	-	**25%**
$PM_{10}/PM_{2.5}$	-	-	0.0060	0.02	0.033	0.79	3.2	0.143	15.0	0.57	-	-	-
SO_2(3)	100.126136	41.6	0.066	0.20	0.361	8.66	34.6	1.56	163.7	6.2	-	-	**80%**
NH_3(10)	6.61948699	10	0.0042	0.01	0.023	0.55	2.2	0.10	10.5	0.40	-	-	**-**
CO_2(11)	**-**	**-**	228.9	686.3	1,259	30,213	120,850	5,438	571,005	**21,753**	4.94E-03	4.94E-03	-
CH_4 (12)	**-**	**-**	1.98E-03	5.94E-03	0.011	0.26	1.0	0.047	4.9	**0.19**	4.28E-08	8.98E-07	-
N_2O (13)	**-**	**-**	2.20E-04	6.60E-04	1.21E-03	0.029	0.12	5.23E-03	0.55	**0.021**	4.75E-09	1.47E-06	-

1) MWM specification.

2) Zero Waste specification, including operation of six engines on the equivalent full-load biogas flow rate for four engines.

3) After application of BAAQMD BACT Guideline 96.5.2, Revision 2, May 14, 2009.

4) Million metric tons per year.

5) Million metric tons of carbon dioxide equivalent per year.

6) As NO_2, and with SCR control system.

7) No control needed to keep annual emissions under 100 tpy, thereby not triggering Major Facility definition threshold.

8) As methane, and with oxidation catalyst control. Also referred to in various regulations as VOC (volatile organic compounds) and ROG (reactive organic gases).

9) Garrett Smith of Cogentech via Zero Waste

10) NH_3 slip emitted from SCR control of NOx emissions.

11) CO_2 emission factor (kg/MMBtu) = 104.06 = in lbs/MMBtu 228.9
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

12) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9 December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf

13) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

14) 2G-Cenergy. Email from Michael J. Turwitt, President & CEO, to Garrett Smith and Eric Herbert of Zero Waste Energy, LLC at 121:36 PM on July 30, 2010. These emission factors satisfy BAAQMD BACT Guideline 96.5.2, Revision 2, May 14, 2009 for IC engines > 50 hp output fired with digester gas.

15) Assumes each engine is down 5 days per year for maintenance.

Table B-4
BioGas Specifications

Component		Volume Percent	MW	Moles of Atom per 100 Moles Gas C	H	N	O	S	Weight Portion	Btu/ft^3 (2) (HHV)	(LHV)	lb/1000 ft^3 (1) --	Btu/lb (1) (HHV)	(LHV)	Volume-Weighted Average MW	HHV/LHV
CH_4	**Methane**	60.00%	16.043	60.00	240.00	0.00	0.00	0.00	0.382	1010.0	909.4	42.274	23,892.2	21,511.9	9.63	**1.1107**
C_2H_6	**Ethane**	0.00%	30.070	0.00	0.00	0.00	0.00	0.00	0.000	1769.7	1618.7	79.237	22,334.1	20,429.2	0.00	**1.0932**
C3H8	**Propane**	0.00%	44.097	0.00	0.00	0.00	0.00	0.00	0.000	2516.2	2314.9	116.199	21,654.1	19,922.2	0.00	**1.0869**
N-C4H10	**n-Butane**	0.00%	58.125	0.00	0.00	0.00	0.00	0.00	0.000	3241.1	2991.2	152.161	21,300.2	19,657.8	0.00	**1.0835**
iso-C4H10	**Iso-Butane**	0.00%	58.125	0.00	0.00	0.00	0.00	0.00	0.000	3230.7	2980.8	152.161	21,232.3	19,589.8	0.00	1.0838
N-C5H12	**n-Pentane**	0.00%	72.152	0.00	0.00	0.00	0.00	0.00	0.000	4008.7	3706.9	190.123	21,085.0	19,497.2	0.00	**1.0814**
iso-C5H12	**Iso-Pentane**	0.00%	72.152	0.00	0.00	0.00	0.00	0.00	0.000	4000.9	3699.0	190.123	21,043.7	19,455.9	0.00	1.0816
C6H14	**n-Hexane**	0.00%	86.179	0.00	0.00	0.00	0.00	0.00	0.000	4756.0	4403.8	227.085	20,943.8	19,392.9	0.00	**1.0800**
H_2S	**Hydrogen sulfide**	0.12%	34.08	0.00	0.24	0.00	0.00	0.12	0.002						0.04	
O_2	**Oxygen**	0.00%	31.998	0.00	0.00	0.00	0.00	0.00	0.000						0.00	
N_2	**Nitrogen**	5.00%	28.014	0.00	0.00	10.00	0.00	0.00	0.056						1.40	
CO_2	**Carbon dioxide**	30.38%	44.009	30.38	0.00	0.00	60.76	0.00	0.531						13.37	
H_2	**Hydrogen**	0.50%	2.016	0.00	1.00	0.00	0.00	0.00	0.000						0.01	
H_2O	**Water**	4.00%	18.015	0.00	8.00	0.00	4.00	0.00	0.029						0.72	
Ash		0.00%														
Total		100.00%							1.000							
Dry Basis, Ash Free																
Total		96.00%		90.38	241.24	10.00	60.76	0.12		**606.0**	**545.6**		9,138	8,228	25.17	**1.1107**
			Mol Wt:	12.01	1.01	14.01	16.00	32.06								
			Gram atoms/100 moles:	1085.57	243.17	140.07	972.10	3.85	2444.75							
			Chemical Analysis (wt%):	44.40	9.95	5.73	39.76	0.16	100.00							

Standard Molar Volume 387.0 ft^3/lb-mole at BAAQMD Standard T (°F) = 70 (BAAQMD Rule 1-228)

Molecular Weights

C	12.01
H	1.01
N	14.01
O	16.00
S	32.06
CH4	16.04
H2O	18.02
NO2	46.01
SO2	64.06
O2	32.00
CO2	44.01
NH3	17.03
CO	28.01
N2	28.01
Ar	39.95
N2+Ar	28.16
N2O	44.01

1) American Society of Mechanical Engineers. *Performance Test Code 22 - Gas Turbines,* 2005.
Properties are for 60.0°F and 14.696 psia.
2) Calculated from Btu/lb x MW /molar volume at District standard temperature
3) Fd (dscf/MMBtu) = 9492.8588

Table B-5
Biogas-Fueled Flare Specifications
Dry Fermentation Anaerobic Digestion Facility

Flare Parameter	Units	Value	Reference
Manufacturer	-	Flare Industries, Inc.	
Model	-	FEF-18, custom	Flare Industries, Inc. brochure
Capacity	ekW	NA	
Brake Horsepower	bhp	NA	
Fuel		Biogas	
Fuel Consumption (LHV	Btu (LHV)/hr	9,902,000	10,997,660 Btu(HHV)/hr
Fuel Consumption	scfm	302	650 = flare capacity
	scfh	18,148	18.0 MMBtu(HHV)/hr maximum capacity
Exhaust Parameter			
Exhaust Flow	acfm	8,345	3.939 m^3/s
	scfm	2,378	
Exhaust Temperature	deg. F	1400	1033 deg K
Exhaust Diameter	in	72	1.8288 m
Number of Exhaust Pipes		1	
Exhaust Stack Height	ft	40	12.192 m, doubled from standard height.
Stack Velocity	ft/sec	4.9	1.50 m/s
Operating Profile			
Annual operation	hrs	120	5 days
Emissions			
NOx	lb/MMBtu	0.06	Flare Industries, Inc. *Engineering Proposal,* April 29, 2010
	lb/MMdscf CH_4	61	Calculated from above emission factor.
CO	lb/MMBtu	0.046	Derived from USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 dr
	lb/MMdscf CH_4	46	USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 draft.
VOC	lb/MMBtu	0.049	Calculated from ppmv emission factor in USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 draft.
SO_2	lb/MMBtu	0.066	
$PM_{10}/PM_{2.5}$	lb/MMdscf CH_4	15	USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 draft.
	lbs/MMBtu	0.0149	
	gr/scf biogas	0.063	
NOx	lb/hr	0.66	
CO	lb/hr	0.50	
VOC	lb/hr	0.54	
$PM_{10}/PM_{2.5}$	lb/hr	0.163	
SO_2	lb/hr	0.72	
SO_2	gr S/dscf biogas	0.139	
SO_2	lb/MMBtu (HHV)	0.066	
CO_2 (1)	lb/hr	2,518	
CH_4 (2)	lb/hr	0.022	
N_2O (3)	lb/hr	0.0024	

1) CO_2 emission factor (kg/MMBtu) = 104.06 = in lbs/MMBtu 228.9

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

2) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

Table B-6
Biogas-Fueled Flare Specifications and Emissions with Biogas Fuel Desulfurization
Dry Fermentation Anaerobic Digestion Facility Project

				Stack Data		Sulfur Control		
				1,400	ºF(1)	Biogas H_2S	69.6	grains S/100scf biogas
3	Number of flares			6.0	ft diameter (1)	BACT	13.9	
				40	ft height(1)	Required Fuel Sulfur Removal Efficiency	80.0%	BACT(13)
24	hours/day(3)			8,345	acfm (2)			
120	hours/year(16)	scfy =	2,177,714	4.9	ft/s			
302.46	scfm fuel flow		18,148 scfh	1.5	m/s			
606	Btu/scf, HHV biogas			3.4	mph			
	Btu(HHV)/bhp-hr		11.00 MMBtu/hr			1319.7		

Pollutant	Emission Factor			Emission Rate								Control System Efficiency (%)
	ppmv(15) @ 3% O_2	lb/MMBtu	lbs/ MMdscf CH_4(4)	lb/hr (1 flare)(3)	lb/hr(3 flares)	lb/day (1 flare)	tons/yr (1 flare)	g/hr (1 flare)	tpy (3 flares)	MMtons /yr (3 flares) (11)	MMtons CO_2e/yr (6 engines) (12)	
NO_x(2,9)	45	**0.060 (1,5)**	61	0.660	1.98	15.84	0.040	299	**0.12**	-	-	
CO(2)	57	0.046 (4)	46	0.501	1.50	12.0	0.030	227	**0.09**	-	-	
POC(2,10)	20 (14)	0.049 (15)	50	0.518	1.55	12.42	0.031	235	**0.09**	-	-	99%
PM_{10}/$PM_{2.5}$(4)	-	0.0149 (4)	15	0.163	0.49	3.92	0.010	74.1	**0.029**	-	-	
SO_2(5)	35.7	0.066	66.3	0.722	2.17	17.32	0.043	327.4	**0.130**	-	-	80%
CO_2(6)	181,206	228.9	231,226	2,518	7,553	60,425	151	1,142,011	**453**	4.12E-04	4.12E-04	0%
CH_4 (7)	4.30	1.98E-03	2.0	0.022	0.0653	0.52	0.0013	9.9	**0.0039**	3.56E-09	7.48E-08	0%
N_2O (8)	0.17	2.20E-04	0.22	0.0024	0.0073	0.058	1.45E-04	1.10	**0.00044**	3.96E-10	1.23E-07	0%

1) Flare Industries, Inc. (FII) specification sheet.
2) Calculated flare combustion volume.
3) Assumes a flare will need to run 24 hours/day for 2 full-load engines down for maintenance on (days) = 5
4) CO and PM emission factors taken from USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 draft.
5) BAAQMD BACT Guideline 80.1, Revision 1, December 16, 1991 for flare burning landfill gas from non-hazardous waste landfill.
6) CO_2 emission factor (kg/MMBtu) = 104.06 = in lbs/MMBtu 228.9
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
7) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
8) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
9) As NO_2.
10) As methane.
11) Million metric tons per year.
12) Million metric tons of carbon dioxide equivalent per year
13) BAAQMD BACT Guideline 96.2.2, Revision 4, March 5, 2009.
14) AP-42 Chapter 2, Section 4 (MSW Landfills) requires control of NMOC to 20 ppm as hexane @ 3% O2.
15) Calculated with EPA's F-Factor equation and Fd calculated for biogas (dscf/MMBtu) = 9,493
16) Assumes both engines down for 2.5 days each per year.

Table B-7
Biofilter 1 (Phase 1) Specifications and Emissions[10]
Dry Fermentation Anaerobic Digestion Facility Project

Bohn Biofilter Corporation		Exhaust Data		Sulfur Control		
		70	ºF(1)	Building exhaust	429	ppbv reduced organic sulfu
1	= No. of biofilters handling 2 front-end loaders	12,600	ft^2 area [2]	Biofilter exhaust	15 (3)	
2	= No. of front-end loaders with exhaust going to biofilter	10.66	ft height[3]	Reported Control Efficiency	96.5%	(4)
24	hours/day	50,300	acfm [3]			
8,760	hours/year	0.067	ft/s			
		0.0203	m/s			
		0.045	mph			

Pollutant	Emission Rate (1 biofilter)					Emission Rate (Biofilter 1)			Control System Efficiency (%)[15]
	ppbv	lb/hr (peak)	lb/day	tons/yr	g/hr	tpy (1 biofilter)	MMtons /yr (1 biofilter) [5]	MMtons CO_2e/yr (biofilter) [6]	
NH_3	20 (3)	0.0027	0.064	23.3	1.20	23.3	NA	NA	-
POC[7,13,14]	1,079	**0.135**	2.71	0.49	61.2	0.49	NA	NA	80%
Reduced Organic S[8]	15 (3)	0.0038	0.090	0.016	1.70	0.016	NA	NA	96.5%
$PM_{10}/PM_{2.5}$[9]	-	**0.00064**	0.00480	0.00088	0.289	0.00088	-	-	99.25 (16)
NOx[9]	1,707	**0.61**	5.3	0.97	278	0.97	-	-	-
CO[9]	6,779	**1.48**	12.03	2.2	672	2.2	-	-	-
SOx[9]	1.5	**0.00076**	0.0063	0.0012	0.35	0.0012	-	-	-
CO_2[10]	233,911	80	668	122	36,414	**122**	1.11E-04	1.11E-04	-
CH_4 [11]	26	0.0033	0.028	0.0050	1.50	**0.0050**	4.57E-09	9.61E-08	-
N_2O[12]	5.3	0.00066	0.0055	0.0010	0.30	**0.0010**	9.15E-10	2.84E-07	-

Table B-7
Biofilter 1 (Phase 1) Specifications and Emissions[10]
Dry Fermentation Anaerobic Digestion Facility Project

1) BAAQMD standard temperature

2) Length = 140 ft, and width = 90 ft.

3) Zero Waste. The 2-cell biofilter can handle up to 75,000 acfm.

4) Average control efficiency of the following: H_2S and methyl mercaptal removal in a biofilter > 99%, and dimethyl sulfide/dimethyl disulfide removal > 94% (Stanchayan, B., W. Parker and C. Pride, Dynamic analysis of a biofilter treating autothermal thermophilic aerobic digestion offgas, Journal of Environmental Engineering and Science, Volume 5, Number 3, pp. 263-272, 2006. Arithmetic mean assumed for full set of reduced organic sulfur compounds.

5) Million metric tons per year.

6) Million metric tons of carbon dioxide equivalent per year.

7) As methane. Also referred to in various regulations as VOC (volatile organic compounds) and ROG (reactive organic gases).

8) Assume reduced organic sulfur compounds are equal volume concentrations of dimethyl disulfide, carbon disulfide, and acetic acid (Rosenfeld et al, 2004).

Rosenfeld, P., M. Grey, and P. Sellew, *Measurement of Biosolids Compost Odor Emissions from a Windrow, Statis Pile, and Biofilter,* Water Environment Research, Volume 76, Number 4, pp. 310-315, 2004.

9) Biofilter 1 (in Phase 1) treat composting emissions and the exhaust from 2 front-end loaders. Assume zero control efficiency of biofilter for loader exhaust NOx, CO, VOC, SOx, and $PM_{10}/PM_{2.5}$. From loader. No information on CO_2, CH_4 or N_2O from composting.

10) CO_2 emission factor (kg/MMBtu) = 0.021775367 = in lbs/MMBtu 0.0

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

11) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

12) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

13) Volume of composting tunnels (per phase) occupied by compost (cybic yards) = 2,560 July 14, 2010 email from DJP&A

14) VOC emission factor for co-compost piles venting through a biofilter during the active phase (lb VOC/hr/cu.yd.) = 1.93E-04

SJVAPCD. Authority to Construct Application Review, Westlake Farms Co-Composting, p.23, 2007, citing Emissions Evaluation of ASP Composting of Anaerobically-Digested Biosolids at the Davenport Composting Facility, December 2003 and corrected by Tom Card, April 2004.

15) Biofilter control of VOC from SJVAPCD. Authority to Construct Application Review, Westlake Farms Co-Composting, p.14, 2007.

16) McKenna, John D., Arthur B. Nunn III, and Dale A. Furlong. "Fabric Filters", Air Pollution Engineering Manual Second Edition, Chapter 3 (Control of Particulate Matter), Figure 2, page 101, John Wiley & Sons, Inc., New York, 2000.

Table B-8
Biofilters 2 and 3 (Phases 2 and 3) Specifications and Emissions[10]
Dry Fermentation Anaerobic Digestion Facility Project

	Exhaust Data		Sulfur Control		
	70	ºF(1)	Building exhaust	429	ppbv reduced organic sulfu
2 = No. of biofilters handling 1 front-end loader eac	12,600	ft^2 area [2]	Biofilter exhaust	15 (3)	
	10.66	ft height[3]	Reported Control Efficiency	96.5%	(4)
24 hours/day	50,300	acfm [3]			
8,760 hours/year	0.067	ft/s			
	0.0203	m/s			
	0.045	mph			

Pollutant	Emission Rate (1 biofilter)						Emission Rate (Biofilters 2+3)			Control System Efficiency (%)[15]
	ppbv	lb/hr (peak)	lb/hr (2 biofilters at peak)	lb/day	tons/yr (1 biofilter)	g/hr	tpy (2 biofilters)	MMtons /yr (2 biofilters) [5]	MMtons CO_2e/yr (2 biofilters) [6]	
NH_3	20 (3)	0.0027	**0.005**	0.064	0.012	1.20	**0.023**	NA	NA	-
POC[7,13,14]	1,027	**0.13**	**0.257**	2.66	0.48	58	**0.969**			80%
Reduced Organic S[8]	15 (3)	0.0038	**0.008**	0.090	0.016	1.70	0.033	NA	NA	96.5%
$PM_{10}/PM_{2.5}$[9]	-	**0.00030**	**0.0006**	0.0028	0.00050	0.14	**0.001**	-	-	99.25 (16)
NOx[9]	1,149	**0.41**	**0.82**	3.7	0.68	187.0	**1.36**	-	-	-
CO[9]	3,604	**0.79**	**1.57**	6.49	1.18	357.1	**2.37**	-	-	-
SOx[9]	0.883311	**0.00044**	**0.00088**	0.0038	0.00069	0.20	**0.00138**	-	-	-
CO_2[10]	135,445	46	**93**	397	72.5	21,086	**145**	1.32E-04	1.32E-04	-
CH_4 [11]	15	0.0019	**0.0039**	0.016	0.0030	0.9	**0.0060**	5.47E-09	1.15E-07	-
N_2O[12]	3.1	0.00039	**0.0008**	0.0033	0.00060	0.17	**0.0012**	1.09E-09	3.39E-07	-

Table B-8
Biofilters 2 and 3 (Phases 2 and 3) Specifications and Emissions[10]
Dry Fermentation Anaerobic Digestion Facility Project

1) BAAQMD standard temperature

2) Length = 140 ft, and width = 90 ft.

3) Zero Waste. The 2-cell biofilter can handle up to 75,000 acfm.

4) Average control efficiency of the following: H_2S and methyl mercaptal removal in a biofilter > 99%, and dimethyl sulfide/dimethyl disulfide removal > 94% (Stanchayan, B., W. Parker and C. Pride, Dynamic analysis of a biofilter treating autothermal thermophilic aerobic digestion offgas, Journal of Environmental Engineering and Science, Volume 5, Number 3, pp. 263-272, 2006. Arithmetic mean assumed for full set of reduced organic sulfur compounds.

5) Million metric tons per year.

6) Million metric tons of carbon dioxide equivalent per year.

7) As methane. Also referred to in various regulations as VOC (volatile organic compounds) and ROG (reactive organic gases).

8) Assume reduced organic sulfur compounds are equal volume concentrations of dimethyl disulfide, carbon disulfide, and acetic acid (Rosenfeld et al, 2004).
Rosenfeld, P., M. Grey, and P. Sellew, *Measurement of Biosolids Compost Odor Emissions from a Windrow, Statis Pile, and Biofilter,* Water Environment Research, Volume 76, Number 4, pp. 310-315, 2004.

9) Biofilters 2 and 3 (in Phases 2 and 3, respectively) treat composting emissions and the exhaust from 1 front-end loader. Assume zero control efficiency of biofilter for loader exhaust NOx, CO, VOC, SOx, and PM10/PM2.5. From loader. No information on CO2, CH4 or N2O from composting.

Assume control on fugitive PM10/2.5 emissions from bulk handing (%) = 90%

10) CO_2 emission factor (kg/MMBtu) = 0.021775367 = in lbs/MMBtu 0.0

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

11) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

12) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

13) Volume of composting tunnels (per phase) occupied by compost (cybic yards) = 2,560 July 14, 2010 email from DJP&A

14) VOC emission factor for co-compost piles venting through a biofilter during the active phase (lb VOC/hr/cu.yd.) = 1.93E-04

SJVAPCD. Authority to Construct Application Review, Westlake Farms Co-Composting, p.23, 2007, citing Emissions Evaluation of ASP Composting of Anaerobically-Digested Biosolids at the Davenport Composting Facility, December 2003 and corrected by Tom Card, April 2004.

15) Biofilter control of VOC from SJVAPCD. Authority to Construct Application Review, Westlake Farms Co-Composting, p.14, 2007.

16) McKenna, John D., Arthur B. Nunn III, and Dale A. Furlong. "Fabric Filters", Air Pollution Engineering Manual Second Edition, Chapter 3 (Control of Particulate

Table B-9
Diesel-Fueled Front-End Loader Engine Specifications and Emissions
Dry Fermentation Anaerobic Digestion Facility

Parameter, Engine	Units	Value	Notes
Manufacturer		Caterpillar	
Model		950H	
Engine		C7 ATAAC	ACERT technology and DPF
Brake Horsepower	Bhp	216	1.34 bhp/ekW
Power, electrical equiv.	ekW	161	0.745 ekW/bhp
Fuel		CARB Diesel	
Specific Gravity		0.95	
Fuel Sulfur Content	ppmw	15	
Fuel Consumption	gph	2.7	Low end of medium range(5)
Max. energy input	MMBtu/hr	0.37	Footnote 1
Parameters, Modeling	**Units**	**Value**	**Notes**
Exhaust Flow	acfm	305	0.144 m^3/s
	scfm	119	Proportioned to Diesel generator engine flow rate by fuel flow rate.
Exhaust Temperature	deg. F	893.3	751.50 deg K (Assumed same as C32 ATAAC engine for Diesel generator engine)
Exhaust Pipe Diameter	in	6	0.1524 m (Estimate)
			7.89 m/s (Calculated)
Exhaust Stack Height	ft	11	3.3528 m (JustAnswer)
Exhaust Velocity	ft/sec	25.9	Calculated
Operating Profile	**Units**	**Value**	**Notes**
Annual Operation	hrs	2,920	Based on 8 hrs/day and 365 days/year.
Pollutant	**Units**	**Value**	**Notes (**Tier 3, Stage IIIA limits)
NOx	g/bhp-hr	2.88	based on 96/4% NOx/NMHC Nonroad model)
		1.5	Offroad Rule, Appendix A, Tier 4 Interim.
CO	g/bhp-hr	2.6	USEPA Tier 3, Stage IIIA
VOC	g/bhp-hr	0.120	based on 96/4% NOx/NMHC Nonroad model)
$PM_{10}/PM_{2.5}$	g/bhp-hr	0.15	Notes (Tier 3, Stage IIIA limits)
SO_2	g/bhp-hr	0.0012	Calculated from fuel flow.
NOx	lb/hr	0.71	Maximum hourly emission rates without load factor.
CO	lb/hr	1.24	
VOC	lb/hr	0.057	
$PM_{10}/PM_{2.5}$	lb/hr	0.071	
SO_2	lb/hr	0.00057	
CO_2 (2)	lb/hr	60	
CH_4 (3)	lb/hr	0.0025	
N_2O (4)	lb/hr	0.00050	

1) California ATCM and EPA Tier 2 emission limit compliant
Energy content of Diesel fuel (Btu/lb) = 19,596
Density of Diesel No. 2 fuel (lbs/gal) = 7.077 (Caterpillar Performance Handbook 40, Jan. 2010)

USEPA. Compilation of Air Pollutant Emission Factors, Volume I - Stationary Point and Area Sources, Chapter 3.3 - Gasoline and Diesel Industrial Engines, October 1996.

Energy content of Diesel fuel (Btu/gal) = 138,691

U.S. EIA. *Energy Calculators*, http://www.eia.doe.gov/kids/energy.cfm?page=about_energy_conversion_calculator-basics

2) CH_4 emission factor (kg/MMBtu) = 0.003

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) CO_2 emission factor (kg/MMBtu) = 73.10

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

4) N_20 emission factor (kg/MMBtu) = 0.0006

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

5) Caterpillar Performance Handbook 40, January 2010.

Table B-10
Front-End Loader Engine Operation and Emissions
Dry Fermentation Anaerobic Digestion Facility Project

161	ekW output[1] Cat 950H		**Stack Data**		Turbocharged and intercooled		
1.34	bhp/kW = 0.745 kW/bhp		893	ºF(1)			
3	Number of outdoor engines[2]		0.5	ft diameter [1]			
216	bhp each[1]		11	ft height[1]	JustAnswer		
8	hours/day[2]		305	acfm [3]			
2,920	hours/year[2,3]		25.9	ft/s	312.5	days	
2.7	gal/hr fuel flo	fuel flow = 7,884 ga/yr	7.89	m/s	12	gal/hr for 7 loaders	
0.56	Load Factor		-	mph	1.71	gal/hr for 1 loader	

Pollutant	Emission Factor		Maximum Emission Rate Without Load Factor[4]								Control System Efficiency (%)
	lb/MMBtu	g/bhp-hr	lb/hr (1 loader)	lb/day (1 loader)	lb/day (3 outdoor loaders)	tons/yr (1 loader)	g/hr	tpy (3 outdoor loaders)	MMtons/ yr (7 engines) [5]	MMtons CO_2e/yr (7 engines) [6]	
NO_x[7]		0.75	0.20	1.6	4.8	0.3	91	0.9	-	-	**50%**
CO		2.6	0.69	5.5	16.6	1.0	314	3.0	-	-	**-**
POC[8]		0.12	0.032	0.26	0.8	0.047	14.5	0.14	-	-	**-**
$PM_{10}/PM_{2.5}$		0.15	0.040	0.320	0.96	0.0584	18.1	0.175	-	-	0%
SO_2		0.0012	0.00032	0.0026	0.008	0.00047	0.15	0.0014	-	-	**-**
CO_2[9]	228.9	71.0	33.8	270	811	49	15,329	148	4.49E-05	4.49E-05	-
CH_4 [10]	1.98E-03	0.0029	0.0014	0.011	0.03	0.0020	0.63	0.006	1.84E-09	3.87E-08	-
N_2O [11]	2.20E-04	0.0006	2.77E-04	0.0022	0.007	4.05E-04	0.13	0.0012	3.68E-10	1.14E-07	-

Table B-10
Front-End Loader Engine Operation and Emissions
Dry Fermentation Anaerobic Digestion Facility Project

1) Caterpillar Performance Handbook 40, January 2010.
2) March 24, 2010 project description.
3) Based on 8 hours every day.
4) Before passage of exhaust of 4 loaders through biofilters.
5) Million metric tons per year.
6) Million metric tons of carbon dioxide equivalent per year.
7) As NO_2 with a NOx control system.
8) As methane. Also referred to various regulations as VOC (volatile organic compounds) and ROG (reactive organic gases).
9) CO_2 emission factor (kg/MMBtu) = 104.06 = in lbs/MMBtu 228.9

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

10) CH_4 emission factor (kg/MMBtu) = 0.0009 = in lbs/MMBtu 0.00198

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

11) N_20 emission factor (kg/MMBtu) = 0.0001 = in lbs/MMBtu 0.00022

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

Table B-11
Diesel-Fueled Emergency Generator Engine Performance and Emissions
Dry Fermentation Anaerobic Digestion Facility

Engine	Units	Value	Parameters for Modeling
Manufacturer		Caterpillar	
Model		C32 ATAAC	
Electrical Rating	ekW	1,000	
Brake Horsepower	Bhp	1,341	
Fuel		CARB Diesel	
Specific Gravity		0.95	
Fuel Sulfur Content	ppmw	15	
Fuel Consumption	gph	72.0	
Exhaust Flow	acfm	8,129	3.837 m^3/s
	scfm	3184	At BAAQMD std T = 70°F
Exhaust Temperature	deg. F	893.3	751.50 deg K
Exhaust Pipe Diameter	in	8	0.2032 m
Exhaust Velocity	fps	388.2	118.31 m/s
Exhaust Stack Height	ft	30	9.144 m
Operating Profile	**Units**	**Value**	**Notes**
Single Test Operation	hrs	**0.5**	per week
Annual Operation	hrs	26	**52** tests
Emissions	**Units**	**Value**	**Notes**
SOx (as SO_2)	g/bhp-hr	0.0026	
NOx	g/bhp-hr	4.93	
CO	g/bhp-hr	0.13	
POC	g/bhp-hr	0.01	
$PM_{10}/PM_{2.5}$	g/bhp-hr	0.018	
$PM_{10}/PM_{2.5}$	gr/scf	0.0010	
NOx	lb/hr	7.29	Note: These emissions occur only over the 1/2 hour of each weekly test.
CO	lb/hr	0.19	
POC	lb/hr	0.015	
$PM_{10}/PM_{2.5}$	lb/hr	0.027	
SOx (as SO_2)	lb/hr	0.0077	
CO_2 (1,2)	lb/hr	805	
CH_4 (1,3)	lb/hr	0.033	
N_2O (1,4)	lb/hr	0.0066	

1) California ATCM and EPA Tier 2 emission limit compliant
Energy content of Diesel fuel (Btu/lb) = 19,596
Energy content of Diesel fuel (Btu/gal) = 138,691
U.S. EIA. *Energy Calculators*, http://www.eia.doe.gov/kids/energy.cfm?page=about_energ

2) CO_2 emission factor (kg/MMBtu) = 73.10 = in lbs/MMBtu 160.8
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) CH_4 emission factor (kg/MMBtu) = 0.003 = in lbs/MMBtu 0.0066
Id, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

4) N_20 emission factor (kg/MMBtu) = 0.0006 = in lbs/MMBtu 0.00132
Id.

Table B-12
Calculation of VOC and NH3 Emissions from Outdoor Curing Piles
Dry Fermentation Anaerobic Digestion Facility Project

Number of curing piles =	15	(Zero Waste)
Length of curing piles (ft) =	175	(Zero Waste)
Width of curing piles (ft) =	30	(Zero Waste)
Height of curing piles (ft) =	12	(Zero Waste)

Cross-sectional shape of curing piles is triangular.

Surface area of curing piles (sq. ft.) = 6,723

VOC emission factor for outside curing of compost =	2.97E-07	lbs VOC/ft^2-min according to page 35 of SJVAPCD (2007) (see Appendix B)
VOC emission rate from outside curing of compost =	1.20E-01	lbs VOC/hr
NH_3 emission factor for outside curing of compost =	6.12E-07	lbs NH_3/ft^2-min according to page 35 of SJVAPCD (2007) (see Appendix B)
NH_3 emission rate from outside curing of compost =	2.47E-01	lbs NH_3/hr

TABLE B-13
MAXIMUM FACILITY BIOGAS FUEL USE, MMBTU (HHV)

Period	Biogas-Fueled CHP Engines (each)	Flares (each)	Maximum Total Fuel Use (all Units)
Per Hour	5.50	11.0	33.0 (a)
Per Day [b]	132	264	792 (a)
Per Year	47,510 (c)	1,320 (d)	48,830

[a] Based on 6 engines or 3 flares.

[b] Based on 24 hours per day of firing.

[c] Maximum fuel use based on 8,640 hours per year of firing, per engine.

[d] Based on 120 hours (5 days) of operation per year.

Table B-14
Bulk Handling Fugitive Dust Emissions
Dry Fermentaion Anaerobic Digestion Facility Project

Fugitive Dust from Bulk Handling of MSW Organic Portion and Amendment Material

The organic portion of MSW dumped in the receiving hall of each of the three phase:	75,000	tpy or	205.5	tpd.		
The amendment material dumped in the receiving hall of each of the three phases =	15,000	tpy or	41.1	tpd.		
The PM_{10} emission factor for dropping the combined bulk materials on each receiving hall floor =			4.6E-05	lbs PM_{10}/ton[a]	1.3E-05	lbs $PM_{2.5}$/ton[a]
			1.13E-02	lbs PM_{10}/day	3.21E-03	lbs $PM_{2.5}$/day
PM_{10} emission rate for dropping the combined bulk materials on each receiving hall floor =			1.42E-03	lbs PM_{10}/hour	4.01E-04	lbs $PM_{2.5}$/hour
			2.07E-03	tons PM_{10}/year	5.85E-04	tons $PM_{2.5}$/year

[a] According to page 21 of SJVAPCD (2007) (taken from EPA [2003] and updated from EPA [2004] for dropping bulking agent from trucks on a stockpile and use of water spray control) (see Appendix

Fugitive Dust from Screening Finished Product at Truck Pickup Stockpile

Combined mass of finished product from all 3 phases screened outside =	270,000	tpy or	739.7	tpd.
PM_{10} emission factor for screening the finished product outside =			1.0E-04	lbs PM_{10}/ton[b]
			7.40E-02	lbs PM_{10}/day
PM_{10} emission rate for screening the finished product outside at Phase 1 =			9.25E-03	lbs PM_{10}/hour
			1.35E-02	tons PM_{10}/year

[b] According to page 24 of SJVAPCD (2007) (taken from EPA [2003] and updated from EPA [2004] for Crushed Stone, Truck Unloading by conveyor to represent recycled compost screening) (see Ap

Fugitive Dust from Loadout of Finished Product from Pickup Stockpile into Heavy-Duty Delivery Trucks

The combined mass loadout of finished product outside at Phase 1 =	270,000	tpy or	739.7	tpd.		
PM_{10} and $PM_{2.5}$ emission factors for loading the finished product into trucks outside at Phase 1 =			4.6E-05	lbs PM_{10}/ton[a]	1.3E-05	lbs $PM_{2.5}$/ton[a]
			3.40E-02	lbs PM_{10}/day	9.62E-03	lbs $PM_{2.5}$/day
PM_{10} and $PM_{2.5}$ emission rates for loading the finished product into trucks outside at Phase 1 =			4.25E-03	lbs PM_{10}/hour	1.20E-03	lbs $PM_{2.5}$/hour
			6.21E-03	tons PM_{10}/year	1.76E-03	tons $PM_{2.5}$/year

[a] According to page 21 of SJVAPCD (2007) (taken from EPA [2003] for dropping bulking agent from trucks on a stockpile and use of water spray control) (see Appendix B)
SJVAPCD. "Preliminary Decision Co-Composting Facility, Authority to Construct Application Review, Project C-1073961, December 14, 2007.
EPA. "Compilation of Air Pollutant Emission Factors", Volume 1 (Stationary Point and Area Sources), Chapter 11, Table 11.19.2-2 , Conveyor Transfer Point (controlled with water spray), June 2003.
EPA. "Compilation of Air Pollutant Emission Factors", Volume 1 (Stationary Point and Area Sources), Chapter 11, Table 11.19.2-2 , Conveyor Transfer Point (controlled with water spray), August 2004

TABLE B-15
ONSITE AND OFFSITE DAILY PEAK AND ANNUAL EMISSIONS
DRY FERMENTATION ANAEROBIC DIGESTION FACILITY PROJECT

Mobile Source	Maximum Number of Units Per Day[12]	Paved and Unpaved Round-Trip Distance Traveled[3]		NOx			ROC			PM_{10} (combustion)			SOx			CO			CO_2			CH_4[4,5,6]			N_2O[7]			Entry Paved Road Fugitive PM_{10} Dust			Entry Paved Road Round-Trip Distance Traveled[3]		Paved Unpaved Road Fugitive Dust			Paved Unpaved Road Round-Trip Distance Traveled[3]		Entry Paved Road Fugitive $PM_{2.5}$ Dust			Office Bldg Paved Road Round-Trip Distance Traveled[3]		Paved Unpaved Road Fugitive $PM_{2.5}$ Dust		
				NOx Emission Factor[2]	Emission Rate		ROC Emission Factor[2]	Emission Rate		Emission Factor[2]	Emission Rate		SOx Emission Factor[2]	Emission Rate		CO Emission Factor[2]	Emission Rate		CO_2 Emission Factor[2]	Emission Rate		CH_4 Emission Factor[2]	Emission Rate		N_2O Emission Factor[2]	Emission Rate		Paved PM_{10} Emission Factor[21]	PM_{10} Emission Rate				Paved PM_{10} Emission Factor[21]	PM_{10} Emission Rate				Paved $PM_{2.5}$ Emission Factor[21]	$PM_{2.5}$ Emission Rate				Paved Unpaved Fugitive $PM_{2.5}$ Emission Factor[22]	$PM_{2.5}$ Emission Rate	
		(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)
On-Site[8]																																													
Phase 1 Heavy-Duty Materials Haul Trucks Traveling (Diesel)[8]	55	0.77	283	18.03	1.69	0.31	3.03	0.28	0.052	1.06	0.10	1.81E-02	0.024	2.25E-03	4.11E-04	12.82	1.20	0.22	2,527	237.3	43.3	0.11	1.01E-02	1.84E-03	0.021	2.01E-03	3.67E-04	1.46E-04	1.66E-03	2.59E-04	0.21	65	1.46E-04	4.54E-03	7.08E-04	0.57	177	3.59E-05	4.10E-04	6.39E-05	-	-	3.59E-05	1.12E-03	1.75E-04
Phase 1 Heavy-Duty Incoming Materials Haul Trucks Idling (Diesel)[14,15]	55	#########	58.4 (hr/yr)	109.47 (g/hr)	2.12	0.39	#########	0.23	0.043	#######	0.036	6.54E-03	########	1.20E-03	2.20E-04	48.45 (g/hr)	0.94	0.17	6,542 (g/hr)	126.9	23.16	#######	5.38E-03	9.82E-04	#########	1.08E-03	1.96E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 2 Heavy-Duty Materials Haul Trucks Traveling (Diesel)[8]	55	0.46	169	18.03	1.01	0.18	3.03	0.17	0.031	1.06	0.060	1.09E-02	0.024	1.35E-03	2.46E-04	12.82	0.72	0.13	2,527	142.0	25.9	0.11	1.01E-02	1.10E-03	0.021	1.20E-03	2.20E-04	1.46E-04	1.66E-03	2.59E-04	0.21	65	1.46E-04	2.05E-03	3.20E-04	0.26	80	3.59E-05	4.10E-04	6.39E-05	-	-	3.59E-05	5.06E-04	7.89E-05
Phase 2 Heavy-Duty Incoming Materials Haul Trucks Idling (Diesel)[14,15]	55	#########	58.4 (hr/yr)	109.47 (g/hr)	2.12	0.39	#########	0.23	0.043	#######	0.036	6.54E-03	########	1.20E-03	2.20E-04	48.45 (g/hr)	0.94	0.17	6,542 (g/hr)	126.9	23.16	#######	5.38E-03	9.82E-04	#########	1.08E-03	1.96E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 3 Heavy-Duty Materials Haul Trucks Traveling (Diesel)[8]	55	0.65	238	18.03	1.43	0.26	3.03	0.24	0.044	1.06	0.084	1.53E-02	0.024	1.90E-03	3.47E-04	12.82	1.01	0.19	2,527	199.9	36.5	0.11	1.01E-02	1.55E-03	0.021	1.70E-03	3.09E-04	1.46E-04	1.66E-03	2.59E-04	0.21	65	1.46E-04	3.56E-03	5.56E-04	0.44	139	3.59E-05	4.10E-04	6.39E-05	-	-	3.59E-05	8.79E-04	1.37E-04
Phase 3 Heavy-Duty Incoming Materials Haul Trucks Idling (Diesel)[14,15]	55	#########	58.4 (hr/yr)	109.47 (g/hr)	2.12	0.39	#########	0.23	0.043	#######	0.036	6.54E-03	########	1.20E-03	2.20E-04	48.45 (g/hr)	0.94	0.17	6,542 (g/hr)	126.9	23.16	#######	5.38E-03	9.82E-04	#########	1.08E-03	1.96E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy-Duty Outgoing Finished Product Haul Trucks Traveling (Diesel)[14,15]	60	0.48	174	18.03	1.14	0.21	3.03	0.19	0.035	1.06	0.067	1.22E-02	0.024	1.51E-03	2.76E-04	12.82	0.81	0.15	2,527	159.1	29.0	0.11	1.10E-02	1.23E-03	0.021	1.35E-03	2.46E-04	1.46E-04	1.81E-03	2.83E-04	0.21	65	1.46E-04	2.34E-03	3.66E-04	0.27	84	3.59E-05	4.47E-04	6.98E-05	-	-	3.59E-05	5.78E-04	9.02E-05
Heavy-Duty Outgoing Finished Product Haul Trucks Idling (Diesel)[14,15]	60	#########	58.4 (hr/yr)	109.47 (g/hr)	2.32	0.42	#########	0.25	0.046	#######	0.039	7.14E-03	########	1.31E-03	2.39E-04	48.45 (g/hr)	1.03	0.19	6,542 (g/hr)	138.5	25.27	#######	5.87E-03	1.07E-03	#########	1.17E-03	2.14E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Infra-site Material Hauling (2 Cat D50 trucks)																																													
Haul Truck Subtotals					13.96	2.55		1.84	0.34		4.56E-01	8.32E-02		1.19E-02	2.18E-03		7.59	1.39		1258	229.50		6.32E-02	9.73E-03		1.07E-02	1.95E-03		6.80E-03	1.06E-03				1.25E-02	1.95E-03				1.68E-03	2.62E-04				3.08E-03	4.81E-04
Water Truck (3,000 gallon)	1																																												
General Delivery Trucks (light-heavy duty diesel)[9]	10	0.092	28.7	1.42	2.87E-03	4.48E-04	2.79E-01	5.66E-04	8.83E-05	5.30E-02	1.07E-04	1.68E-05	1.00E-02	2.03E-05	3.16E-06	2.86E+00	5.81E-03	9.06E-04	1,004	2.0	0.32	0.11	2.17E-04	3.39E-05	0.021	4.35E-05	6.78E-06	1.46E-04	1.34E-04	2.09E-05	0.092	29	-	-	-	-	-	3.59E-05	3.30E-05	5.15E-06	0.092	29	-	-	-
Employee and Visitor Light Duty Trucks (gasoline)[10]	36	0.092	28.7	0.51	3.71E-03	5.79E-04	3.30E-01	2.41E-03	3.76E-04	5.10E-02	3.72E-04	5.81E-05	7.00E-03	5.11E-05	7.97E-06	6.38E+00	4.65E-02	7.26E-03	702	5.1	0.80	0.028	2.05E-04	3.20E-05	0.0056	4.11E-05	6.41E-06	9.87E-05	3.27E-04	5.10E-05	0.092	29	-	-	-	-	-	2.43E-05	8.06E-05	1.26E-05	0.092	29	-	-	-
Subtotal:					27.9	5.09		3.7	0.67		0.91	0.17		0.02	0.0044		15.23	2.78		2522	460		0.1	0.020		2.14E-02	3.91E-03		0.014	0.0022				2.50E-02	3.90E-03				3.47E-03	5.41E-04				6.16E-03	9.61E-04
Off-Site[11]																																													
Heavy-Duty Materials Haul Trucks (Diesel)[8]	212	100	36,500	13.90	649.96	0.92	0.76	35.48	0.050	0.58	27.11	0.038	0.015	0.70	0.0010	4.66	217.8	0.31	1,606	75,079	106.1	0.11	5.01	0.007	0.021	1.00E+00	1.42E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy-Duty Amendment Materials Haul Trucks (Diesel)[8]	13	0.15	55	13.90	0.060	0.056	0.76	0.0033	0.0031	0.58	0.0025	0.0023	0.015	0.000065	0.000061	4.66	0.020	0.019	1,606	6.98	6.5	0.11	4.65E-04	4.34E-04	0.021	9.31E-05	8.68E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Delivery Trucks (light-heavy duty diesel)[9]	10	50	18,250	1.59	1.7519	0.00050	0.067	0.00014	0.000021	0.034	0.000069	0.0000108	0.0050	0.0000101	0.0000016	1.22	0.0025	0.00038	511	1.04	0.16	0.11	2.17E-04	3.39E-05	0.021	4.35E-05	6.78E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Employee and Visitor Light Duty Trucks (gasoline)[10]	36	50	18,250	0.508	2.02	0.00058	0.158	0.0012	0.00018	0.033	0.00024	0.000038	0.0050	0.000037	0.0000057	4.41	0.032	0.0050	482	3.5	0.55	0.028	2.05E-04	3.20E-05	0.0056	4.11E-05	6.41E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal:					654	0.98		35.5	0.053		27.1	0.041		0.701	0.0011		217.84	0.33		75090	113		5.0	0.008		1.00	0.0015		0.00	0.0000				0.00E+00	0.00E+00				0.00E+00	0.00E+00				0.00E+00	0.00E+00
TOTAL					27.9	5.09		39.2	0.725		28.0	0.207		0.725	0.0054		233.077	3.11		77,613	573		5.1	0.027		1.023	0.0054		0.014	0.0022				2.50E-02	3.90E-03				3.47E-03	5.41E-04				6.16E-03	9.61E-04

-- = Not applicable.
1) 312 operating days per year, assuming 6 days per week.
2) Emission factors from EMFAC2007 for Bay Area, 15 mph onsite, 55 mph offsite for Diesel-fueled trucks, and 65 mph offsite for gasoline-fueled vehicles.
3) Assumes heavy-duty materials haul trucks travel from southeast corner site entrance on paved and unpaved road lengths to the 3 receiving halls (ft) = 1,663 507 meters
Assumes employee and visitor vehicles and delivery trucks travel distance from southwest corner site entrance to the parking lot next to the office built 243 74 meters
4) CH_4 emitted by combustion of Diesel fuel or gasoline (g CH4/MMBtu) = 3.0
5) Energy content of Diesel fuel (Btu/gal) = 138,691
Energy content of gasoline (Btu/gal) = 114,855 Grohmann et al. *Potential for Fuels from Biomass*, Table II, p. 359.
6) Diesel fuel consumption rate of heavy-duty haul trucks (mi/gal) = 3.883
Gasoline consumption rate of employee and visitor vehicles (mi/gal) = 12.25
7) N_2O emitted by combustion of Diesel fuel or gasoline (g N2O/MMBtu) = 0.6
8) Materials haul trucks are assumed to be heavy heavy-duty (HHD) category in EMFAC2007.
9) Delivery trucks are assumed to be light heavy-duty (LHD1) category in EMFAC2007.
10) Employee and visitor vehicles are assumed to be light-duty truck (LDT1) category in EMFAC2007.
11) Assumes heavy-duty materials haul trucks travel to entrance (mi) = 50 (Zero Waste and Hexagon Transportation Consultants, Inc.)
Assumes employee and visitor vehicles and delivery trucks travel to entrance (mi) = 25 (Estimate)
12) No. of large capacity transfer trucks (/day) = 105 to bring organic portion of MSW to the Project
no. of collection route type trucks (/day) = 45
no. of finished product trucks (/day) = 60 to take away finished product from the Project.
no. of amendment materials trucks (/day) = 13
13) Offsite distance for amendment materials hauled from Zanker Landfill to site boundary (ft) = 400 3,195
14) Each heavy-duty materials haul truck assumed to idle while dumping organic waste or loading finished product (minutes) = 9.6
15) Idling CH4 and N2O emission factors proportioned from EMFAC2007 CO2 emission factor with the same ratios as for the trucks traveling on site.
16) Entry paved road length (m) = 167
17) Phase 1 paved unpaved road length (m) = 456
18) Phase 2 paved unpaved road length (m) = 206
19) Phase 3 paved unpaved road length (m) = 358
20) Paved unpaved road length to finished product stockpile (m) = 216
21) See Worksheet "Dust E Factors".
22) See Worksheet "Dust Factors".

Table B-16
BAAQMD EMFAC2007
Dry Fermentation Anaerobic Digestion Facility Project

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour

ROG Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22.205	23.704	3.173	18.33	22.205	22.956	3.173	14.335	22.205	23.038	3.173	6.277	0	0	12.641	12.026	22.205	22.439	3.173	11.143	0	0	0	0	0	0	0	0	22.205	22.929	3.173	5.439	0	0	0	0	0.259	0.378	5.973	0.639
15	9.19	0.121	0.297	0.179	9.344	0.212	0.146	0.33	9.326	0.154	0.196	0.194	11.767	0.175	0.122	0.204	8.076	0.262	0.255	0.279	8.076	0.707	0.369	0.591	12.163	1.31	0.368	0.552	34.616	7.948	2.757	3.029	12.163	1.155	0.376	0.718	14.874	4.526	1.151	1.644	3.559	2.281	0	3.068	12.163	2.071	0.39	0.742	12.163	0.991	0.185	1.328	6.934	0.169	1.25	0.295
55	4.431	0.036	0.113	0.064	4.506	0.066	0.056	0.124	4.497	0.046	0.074	0.065	5.687	0.05	0.046	0.064	1.631	0.051	0.097	0.067	1.631	0.137	0.14	0.144	2.491	0.247	0.14	0.164	7.225	1.609	0.712	0.759	2.491	0.209	0.143	0.174	3.062	0.937	0.412	0.492	3.983	2.083	0	3.253	2.491	0.406	0.148	0.21	2.491	0.188	0.07	0.263	4.235	0.053	0.352	0.113
65	5.86	0.045	0.11	0.082	5.959	0.082	0.054	0.158	5.947	0.057	0.073	0.083	7.513	0.063	0.045	0.082	1.676	0.053	0.095	0.068	1.676	0.141	0.137	0.146	2.559	0.254	0.137	0.163	7.418	1.654	1.022	1.057	2.559	0.215	0.14	0.175	3.145	0.962	0.452	0.531	6.505	3.46	0	5.335	2.559	0.417	0.145	0.21	2.559	0.194	0.069	0.27	6.113	0.068	0.465	0.154

CO Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137.652	142.996	26.3	112.457	137.652	140.329	26.3	90.644	137.652	140.622	26.3	44.168	0	0	50.934	48.454	137.652	138.486	26.3	72.712	0	0	0	0	0	0	0	0	137.652	140.231	26.3	39.395	0	0	0	0	1.608	2.294	30.133	3.592
15	84.12	2.971	1.462	3.481	83.25	5.48	1.145	6.376	82.797	3.949	1.279	4.288	142.358	3.783	1.055	4.116	152.592	2.877	1.455	2.864	152.592	7.938	1.678	5.81	228.888	17.258	3.601	6.448	897.045	79.417	8.801	12.815	228.888	15.687	3.54	8.956	258.116	25.003	6.031	10.101	28.492	13.12	0	22.585	228.888	25.488	3.737	9.435	228.888	23.241	1.885	28.726	64.713	3.783	5.085	4.521
55	65.309	1.62	0.553	2.021	64.633	3.077	0.433	3.809	64.281	2.165	0.484	2.433	110.523	2.067	0.399	2.329	65.875	1.242	0.55	1.216	65.875	3.427	0.635	2.469	98.813	7.45	1.362	2.622	387.264	34.285	2.882	4.659	98.813	6.772	1.339	3.756	111.431	10.794	2.081	3.903	56.851	15.703	0	41.04	98.813	11.003	1.414	3.897	98.813	10.034	0.713	12.39	63.182	2.077	1.749	2.74
65	102.857	1.531	0.684	2.171	101.794	3.194	0.535	4.412	101.24	2.087	0.598	2.517	174.067	1.95	0.493	2.371	92.552	1.745	0.68	1.684	92.552	4.814	0.785	3.423	138.827	10.467	1.684	3.489	544.085	48.169	3.228	5.765	138.827	9.515	1.655	5.144	156.555	15.165	2.906	5.468	113.366	26.74	0	80.08	138.827	15.459	1.748	5.263	138.827	14.097	0.882	17.395	109.298	2.094	2.065	3.283

NOx Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	**HHD ALL**	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.458	1.559	75.051	20.783	1.458	1.509	75.051	33.546	1.458	1.514	75.051	63.551	0	0	109.465	104.133	1.458	1.474	75.051	44.611	0	0	0	0	0	0	0	0	1.458	1.507	75.051	66.571	0	0	0	0	0.017	0.025	73.077	3.452
15	3.423	0.242	1.431	0.265	3.332	0.441	1.451	0.508	3.321	0.46	1.427	0.475	5.201	0.514	1.477	0.529	1.763	0.33	4.465	1.415	1.763	0.783	5.589	2.881	2.645	2.09	8.806	7.757	16.051	9.196	18.474	**18.027**	2.645	2.475	9.168	6.399	3.247	3.132	23.064	20.603	1.038	1.025	0	1.033	2.645	2.039	11.297	10.239	2.645	1.386	9.721	2.342	2.404	0.358	11.939	0.924
55	4.82	0.178	1.531	0.21	4.691	0.337	1.553	0.429	4.677	0.337	1.527	0.358	7.323	0.374	1.581	0.396	2.413	0.452	4.779	1.589	2.413	1.072	5.982	3.216	3.619	2.859	9.425	8.401	21.961	12.582	13.964	13.904	3.619	3.386	9.813	7.155	4.443	4.285	24.393	21.91	1.426	1.099	0	1.3	3.619	2.79	12.092	11.033	3.619	1.896	10.405	2.889	3.366	0.281	10.669	0.803
65	5.18	0.199	2.222	0.235	5.042	0.394	2.253	0.508	5.026	0.383	2.215	0.407	7.871	0.425	2.294	0.452	2.575	0.483	6.932	2.175	2.575	1.144	8.678	4.432	3.863	3.052	13.672	12.014	23.438	13.429	14.734	14.678	3.863	3.614	14.236	9.842	4.742	4.573	40.784	36.312	1.523	1.232	0	1.411	3.863	2.978	17.541	15.876	3.863	2.024	15.094	3.518	3.613	0.317	13.848	0.989

CO_2 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4776.9	4776.901	4098	4599.308	4776.9	4776.899	4098.001	4481.15	4776.9	4776.899	4097.999	4204.169	0	0	6541.716	6223.096	4776.9	4776.9	4098	4378.872	0	0	0	0	0	0	0	0	4776.9	4776.9	4098	4176.273	0	0	0	0	55.785	77.289	4193.378	270.131
15	782.628	573.977	359.688	574.807	782.544	711.672	347.197	702.156	782.792	715.222	350.371	714.758	949.382	977.122	346.505	974.334	1175.484	1175.484	520.996	1004.277	1175.484	1175.485	534.135	896.093	1175.485	1175.484	1505	1453.468	1175.484	1175.484	2595.958	2526.773	1175.485	1175.484	1505	1368.674	1175.484	1175.485	2674.467	2489.288	167.696	191.886	0	176.991	1175.484	1175.484	1505	1467.009	1175.484	1175.484	1505	1211.401	530.962	663.245	1713.755	711.053
55	428.474	314.455	359.688	315.281	428.013	389.813	347.197	389.093	428.149	391.801	350.371	391.874	519.327	535.296	346.505	534.442	507.469	507.469	520.996	511.008	507.469	507.469	534.135	519.086	507.469	507.469	1505	1349	507.469	507.469	1662.352	1606.102	507.469	507.469	1505	1092.306	507.469	507.469	2674.467	2406.765	94.988	181.846	0	128.363	507.469	507.469	1505	1389.99	507.469	507.469	1505	616.199	288.89	360.926	1377.813	407.827
65	534.162	391.472	359.688	392.303	533.682	485.357	347.197	482.031	533.852	487.792	350.371	487.707	647.525	666.423	346.505	664.997	712.968	712.968	520.996	662.75	712.968	712.968	534.135	635.063	712.968	712.968	1505	1381.137	712.968	712.968	1711.772	1663.124	712.968	712.968	1505	1177.323	712.968	712.968	2674.467	2432.151	96.173	255.925	0	157.558	712.968	712.968	1505	1413.683	712.968	712.968	1505	799.299	352.457	451.015	1395.595	494.23

SO_2 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.049	0.049	0.039	0.046	0.049	0.049	0.039	0.045	0.049	0.049	0.039	0.041	0	0	0.062	0.059	0.049	0.049	0.039	0.043	0	0	0	0	0	0	0	0	0.049	0.049	0.039	0.04	0	0	0	0	0.001	0.001	0.04	0.003
15	0.009	0.006	0.003	0.006	0.009	0.007	0.003	0.007	0.009	0.007	0.003	0.007	0.012	0.009	0.003	0.009	0.014	0.011	0.005	0.01	0.014	0.011	0.005	0.009	0.015	0.012	0.014	0.014	0.026	0.013	0.025	0.024	0.015	0.012	0.014	0.013	0.016	0.012	0.026	0.024	0.002	0.002	0	0.002	0.015	0.012	0.014	0.014	0.015	0.012	0.014	0.012	0.006	0.006	0.016	0.007
55	0.005	0.003	0.003	0.003	0.005	0.004	0.003	0.004	0.005	0.004	0.003	0.004	0.007	0.005	0.003	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.014	0.013	0.011	0.005	0.016	0.015	0.006	0.005	0.014	0.01	0.007	0.005	0.026	0.023	0.002	0.002	0	0.002	0.006	0.005	0.014	0.013	0.006	0.005	0.014	0.006	0.004	0.003	0.013	0.004
65	0.007	0.004	0.003	0.004	0.007	0.005	0.003	0.005	0.007	0.005	0.003	0.005	0.009	0.006	0.003	0.006	0.008	0.007	0.005	0.006	0.008	0.007	0.005	0.006	0.009	0.007	0.014	0.013	0.015	0.008	0.016	0.016	0.009	0.007	0.014	0.011	0.009	0.007	0.026	0.023	0.003	0.003	0	0.003	0.009	0.007	0.014	0.014	0.009	0.007	0.014	0.008	0.005	0.004	0.013	0.005

PM_{10} Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.789	0.206	0	0	1.012	0.441	0	0	0.968	0.817	0	0	1.848	1.758	0	0	0.992	0.581	0	0	0	0	0	0	0	0	0	0	0.88	0.779	0	0	0	0	0	0	1.089	0.051
15	0.055	0.021	0.224	0.022	0.054	0.028	0.096	0.03	0.056	0.049	0.136	0.049	0.056	0.049	0.079	0.049	0.045	0.013	0.068	0.028	0.045	0.021	0.09	0.051	0.045	0.024	0.446	0.38	0.045	0.047	1.044	0.996	0.045	0.026	0.436	0.266	0.045	0.037	0.513	0.455	0.052	0.003	0	0.033	0.045	0.023	0.527	0.47	0.045	0.008	0.326	0.044	0.054	0.03	0.582	0.056
55	0.027	0.007	0.085	0.007	0.026	0.009	0.037	0.01	0.027	0.016	0.052	0.016	0.027	0.016	0.03	0.016	0.01	0.003	0.026	0.009	0.01	0.004	0.034	0.017	0.01	0.005	0.169	0.144	0.01	0.01	0.543	0.517	0.01	0.005	0.165	0.099	0.01	0.008	0.184	0.162	0.058	0.003	0	0.037	0.01	0.005	0.2	0.178	0.01	0.002	0.124	0.015	0.04	0.01	0.273	0.022
65	0.035	0.009	0.083	0.009	0.035	0.011	0.036	0.012	0.036	0.02	0.051	0.02	0.036	0.02	0.029	0.02	0.01	0.003	0.025	0.009	0.01	0.004	0.033	0.017	0.01	0.005	0.166	0.141	0.01	0.01	0.761	0.724	0.01	0.006	0.162	0.097	0.01	0.008	0.202	0.178	0.095	0.005	0	0.06	0.01	0.005	0.196	0.174	0.01	0.002	0.121	0.015	0.06	0.012	0.351	0.029

PM_{10}-Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.035	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.008	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.02	0.009
55	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.035	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.008	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.02	0.009
65	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.035	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.008	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.02	0.009

PM_{10}-Brake Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.01	0.013	0.018	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.01	0.013	0.018	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.01	0.013	0.018	0.013

Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	9.386	15.301	0	15.264	9.396	12.289	0	12.25	9.401	12.273	0	12.26	7.32	9.008	0	9.003	6.149	7.504	0	7.5	6.149	7.445	0	7.435	5.63	7.342	0	7.305	3.289	6.685	0	6.636	5.63	7.36	0	7.352	5.442	7.209	0	7.103	39.56	40.28	0	39.837	5.63	7.25	0	7.03	5.63	7.292	0	7.221	22.185	13.709	0	13.808
55	16.248	27.939	0	27.865	16.286	22.438	0	22.355	16.3	22.411	0	22.384	12.459	16.447	0	16.437	14.375	17.389	0	17.379	14.375	17.262	0	17.241	13.208	17.038	0	16.956	7.779	15.637	0	15.524	13.208	17.076	0	17.059	12.796	16.8	0	16.56	44.938	41.526	0	43.627	13.208	16.841	0	16.347	13.208	16.913	0	16.755	28.407	25.003	0	25.043
65	12.401	22.486	0	22.422	12.433	18.058	0	17.982	12.446	18.036	0	18.011	9.377	13.23	0	13.221	10.256	12.378	0	12.371	10.256	12.29	0	12.275	9.432	12.133	0	12.075	5.567	11.158	0	11.078	9.432	12.16	0	12.147	9.143	11.976	0	11.806	30.024	28.663	0	29.501	9.432	11.996	0	11.647	9.432	12.043	0	11.931	19.836	20.076	0	20.073

Diesel - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	28.024	28.024	0	0	29.032	29.032	0	0	28.769	28.769	0	0	29.09	29.09	0	0	19.347	19.347	0	0	18.871	18.871	0	0	6.698	6.698	0	0	3.883	3.883	0	0	6.698	6.698	0	0	3.769	3.769	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	9.702	9.702
55	0	0	28.024	28.024	0	0	29.032	29.032	0	0	28.769	28.769	0	0	29.09	29.09	0	0	19.347	19.347	0	0	18.871	18.871	0	0	6.698	6.698	0	0	6.064	6.064	0	0	6.698	6.698	0	0	3.769	3.769	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	10.487	10.487
65	0	0	28.024	28.024	0	0	29.032	29.032	0	0	28.769	28.769	0	0	29.09	29.09	0	0	19.347	19.347	0	0	18.871	18.871	0	0	6.698	6.698	0	0	5.889	5.889	0	0	6.698	6.698	0	0	3.769	3.769	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	10.424	10.424

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	3.239	0.05	0	0.074	3.187	0.068	0	0.106	3.158	0.053	0	0.067	3.884	0.062	0	0.074	5.239	0.131	0	0.145	5.239	0.25	0	0.246	7.859	0.505	0	0.404
10	3.212	0.098	0	0.121	3.16	0.132	0	0.167	3.131	0.104	0	0.117	3.85	0.122	0	0.133	5.194	0.257	0	0.255	5.194	0.487	0	0.428	7.791	0.985	0	0.535
20	3.242	0.187	0	0.209	3.19	0.252	0	0.282	3.161	0.199	0	0.212	3.887	0.235	0	0.245	5.244	0.492	0	0.461	5.244	0.925	0	0.766	7.866	1.867	0	0.784
30	3.388	0.267	0	0.289	3.334	0.359	0	0.387	3.303	0.285	0	0.298	4.062	0.338	0	0.348	5.48	0.704	0	0.648	5.48	1.315	0	1.068	8.219	2.646	0	1.013
40	3.649	0.338	0	0.362	3.59	0.454	0	0.481	3.557	0.361	0	0.375	4.374	0.431	0	0.441	5.901	0.894	0	0.817	5.901	1.656	0	1.335	8.852	3.323	0	1.223
50	4.025	0.4	0	0.426	3.96	0.537	0	0.564	3.924	0.429	0	0.444	4.825	0.515	0	0.525	6.509	1.061	0	0.967	6.509	1.948	0	1.566	9.763	3.897	0	1.414
60	4.184	0.453	0	0.48	4.117	0.607	0	0.633	4.079	0.488	0	0.503	5.016	0.589	0	0.599	6.767	1.207	0	1.096	6.767	2.192	0	1.756	10.15	4.369	0	1.558
120	4.138	0.593	0	0.618	4.071	0.765	0	0.784	4.034	0.654	0	0.668	4.961	0.83	0	0.838	6.692	1.555	0	1.4	6.692	2.525	0	2.012	10.038	4.806	0	1.676
180	4.504	0.582	0	0.609	4.432	0.76	0	0.784	4.391	0.644	0	0.66	5.4	0.815	0	0.824	7.285	1.608	0	1.45	7.285	2.66	0	2.121	10.927	5.099	0	1.788
240	4.871	0.615	0	0.645	4.793	0.804	0	0.831	4.749	0.682	0	0.699	5.839	0.863	0	0.874	7.877	1.703	0	1.537	7.877	2.811	0	2.243	11.816	5.383	0	1.896
300	5.237	0.648	0	0.681	5.153	0.847	0	0.876	5.106	0.72	0	0.738	6.279	0.912	0	0.923	8.47	1.796	0	1.621	8.47	2.957	0	2.362	12.705	5.658	0	2.003
360	5.604	0.681	0	0.715	5.514	0.889	0	0.921	5.463	0.756	0	0.775	6.718	0.959	0	0.971	9.063	1.887	0	1.705	9.063	3.099	0	2.477	13.594	5.924	0	2.107
420	5.97	0.712	0	0.749	5.874	0.929	0	0.964	5.82	0.792	0	0.812	7.157	1.005	0	1.019	9.655	1.976	0	1.786	9.655	3.236	0	2.589	14.483	6.18	0	2.208
480	6.336	0.743	0	0.782	6.235	0.969	0	1.007	6.178	0.826	0	0.849	7.597	1.051	0	1.065	10.248	2.063	0	1.865	10.248	3.37	0	2.698	15.372	6.427	0	2.306
540	6.703	0.773	0	0.815	6.595	1.007	0	1.048	6.535	0.86	0	0.884	8.036	1.095	0	1.111	10.841	2.148	0	1.943	10.841	3.498	0	2.803	16.261	6.664	0	2.402
600	7.069	0.802	0	0.846	6.956	1.045	0	1.089	6.892	0.894	0	0.919	8.475	1.139	0	1.156	11.433	2.231	0	2.019	11.433	3.623	0	2.904	17.15	6.893	0	2.496
660	7.436	0.83	0	0.877	7.317	1.081	0	1.128	7.249	0.926	0	0.952	8.915	1.182	0	1.2	12.026	2.312	0	2.094	12.026	3.742	0	3.003	18.039	7.112	0	2.587
720	7.802	0.858	0	0.907	7.677	1.116	0	1.166	7.607	0.958	0	0.986	9.354	1.225	0	1.243	12.619	2.391	0	2.167	12.619	3.858	0	3.098	18.928	7.321	0	2.675

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	13.051	1.371	0	1.19	7.859	0.444	0	0.38	9.596	0.532	0	0.133	1.576	0.263	0	1.155	7.859	0.426	0	0.166	7.859	0.349	0	0.669	3.246	0.071	0	0.115
10	12.939	2.672	0	1.753	7.791	0.865	0	0.623	9.514	1.038	0	0.191	1.563	0.514	0	1.226	7.791	0.831	0	0.205	7.791	0.679	0	0.946	3.218	0.139	0	0.178
20	13.062	5.066	0	2.802	7.866	1.64	0	1.074	9.605	1.968	0	0.3	1.578	0.974	0	1.384	7.866	1.576	0	0.279	7.866	1.288	0	1.466	3.249	0.265	0	0.296
30	13.649	7.181	0	3.751	8.219	2.325	0	1.477	10.036	2.789	0	0.399	1.648	1.38	0	1.562	8.219	2.233	0	0.349	8.219	1.826	0	1.938	3.395	0.378	0	0.404
40	14.7	9.018	0	4.599	8.852	2.919	0	1.832	10.809	3.503	0	0.488	1.775	1.733	0	1.762	8.852	2.805	0	0.416	8.852	2.293	0	2.364	3.656	0.478	0	0.501
50	16.214	10.577	0	5.347	9.763	3.424	0	2.138	11.922	4.108	0	0.567	1.958	2.033	0	1.982	9.763	3.289	0	0.478	9.763	2.689	0	2.744	4.033	0.566	0	0.588
60	16.856	11.857	0	5.935	10.15	3.838	0	2.385	12.395	4.605	0	0.628	2.036	2.279	0	2.114	10.15	3.688	0	0.523	10.15	3.014	0	3.038	4.193	0.64	0	0.66
120	16.67	13.17	0	6.498	10.038	4.288	0	2.644	12.257	5.025	0	0.676	2.013	2.533	0	2.18	10.038	4.071	0	0.559	10.038	3.136	0	3.136	4.146	0.813	0	0.82
180	18.146	13.974	0	6.916	10.927	4.55	0	2.81	13.343	5.332	0	0.72	2.192	2.548	0	2.306	10.927	4.319	0	0.597	10.927	3.327	0	3.34	4.514	0.814	0	0.827
240	19.623	14.753	0	7.322	11.816	4.804	0	2.971	14.429	5.629	0	0.762	2.37	2.689	0	2.472	11.816	4.56	0	0.635	11.816	3.512	0	3.54	4.881	0.861	0	0.876
300	21.099	15.506	0	7.718	12.705	5.049	0	3.127	15.514	5.916	0	0.804	2.548	2.827	0	2.638	12.705	4.793	0	0.672	12.705	3.692	0	3.734	5.248	0.907	0	0.925
360	22.575	16.234	0	8.102	13.594	5.286	0	3.278	16.6	6.194	0	0.844	2.726	2.959	0	2.801	13.594	5.018	0	0.708	13.594	3.865	0	3.923	5.615	0.952	0	0.972
420	24.052	16.936	0	8.475	14.483	5.515	0	3.425	17.685	6.462	0	0.883	2.905	3.087	0	2.963	14.483	5.235	0	0.744	14.483	4.032	0	4.107	5.982	0.995	0	1.018
480	25.528	17.612	0	8.837	15.372	5.735	0	3.567	18.771	6.72	0	0.921	3.083	3.211	0	3.124	15.372	5.444	0	0.778	15.372	4.193	0	4.286	6.35	1.038	0	1.064
540	27.004	18.263	0	9.188	16.261	5.947	0	3.703	19.856	6.968	0	0.958	3.261	3.329	0	3.283	16.261	5.645	0	0.812	16.261	4.348	0	4.46	6.717	1.079	0	1.108
600	28.48	18.889	0	9.528	17.15	6.151	0	3.836	20.942	7.207	0	0.994	3.44	3.444	0	3.441	17.15	5.838	0	0.845	17.15	4.497	0	4.628	7.084	1.12	0	1.151
660	29.957	19.489	0	9.857	18.039	6.346	0	3.963	22.027	7.436	0	1.029	3.618	3.553	0	3.597	18.039	6.024	0	0.877	18.039	4.64	0	4.791	7.451	1.159	0	1.193
720	31.433	20.064	0	10.174	18.928	6.533	0	4.085	23.113	7.655	0	1.062	3.796	3.658	0	3.752	18.928	6.202	0	0.909	18.928	4.777	0	4.95	7.819	1.197	0	1.234

Pollutant Name: Carbon Monoxide   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	24.224	0.503	0	0.678	24.322	0.81	0	1.087	24.202	0.599	0	0.704	43.141	0.653	0	0.778	42.366	1.535	0	1.589	42.366	2.922	0	2.685	63.549	7.838	0	4.313
10	21.45	0.989	0	1.138	21.538	1.59	0	1.798	21.432	1.179	0	1.267	38.202	1.285	0	1.39	37.516	3.016	0	2.858	37.516	5.73	0	4.794	56.274	15.358	0	6.166
20	16.559	1.909	0	2.013	16.626	3.062	0	3.142	16.544	2.279	0	2.338	29.49	2.485	0	2.554	28.96	5.818	0	5.262	28.96	11.001	0	8.761	43.44	29.442	0	9.663
30	12.539	2.76	0	2.825	12.59	4.416	0	4.385	12.528	3.299	0	3.333	22.331	3.599	0	3.638	21.93	8.407	0	7.488	21.93	15.815	0	12.391	32.895	42.252	0	12.881
40	9.391	3.542	0	3.576	9.429	5.653	0	5.527	9.383	4.241	0	4.254	16.725	4.629	0	4.642	16.425	10.783	0	9.536	16.425	20.171	0	15.685	24.637	53.788	0	15.821
50	7.116	4.255	0	4.265	7.145	6.772	0	6.568	7.109	5.103	0	5.099	12.673	5.573	0	5.567	12.445	12.945	0	11.407	12.445	24.07	0	18.642	18.667	64.051	0	18.482
60	5.712	4.899	0	4.892	5.736	7.773	0	7.508	5.707	5.885	0	5.87	10.173	6.431	0	6.411	9.991	14.894	0	13.099	9.991	27.51	0	21.263	14.986	73.039	0	20.865
120	16.301	6.945	0	6.995	16.368	10.447	0	10.202	16.287	8.392	0	8.408	29.031	9.271	0	9.285	28.51	19.317	0	17.079	28.51	32.516	0	25.305	42.765	83.531	0	24.721
180	25.757	6.456	0	6.581	25.862	9.892	0	9.793	25.734	7.882	0	7.944	45.872	8.673	0	8.742	45.048	19.332	0	17.188	45.048	33.206	0	26.006	67.572	85.973	0	26.232
240	34.211	6.812	0	6.996	34.35	10.364	0	10.354	34.181	8.351	0	8.448	60.928	9.201	0	9.312	59.833	20.373	0	18.185	59.833	34.405	0	27.081	89.75	88.496	0	27.678
300	41.662	7.141	0	7.378	41.832	10.81	0	10.877	41.626	8.781	0	8.908	74.199	9.684	0	9.83	72.866	21.339	0	19.106	72.866	35.591	0	28.128	109.298	91.098	0	29.058
360	48.112	7.444	0	7.725	48.308	11.23	0	11.362	48.069	9.171	0	9.325	85.685	10.121	0	10.299	84.145	22.23	0	19.952	84.145	36.764	0	29.146	126.218	93.782	0	30.372
420	53.559	7.721	0	8.039	53.777	11.623	0	11.808	53.512	9.523	0	9.698	95.386	10.513	0	10.717	93.672	23.047	0	20.723	93.672	37.924	0	30.137	140.508	96.545	0	31.621
480	58.004	7.971	0	8.32	58.241	11.99	0	12.216	57.953	9.835	0	10.028	103.302	10.859	0	11.084	101.447	23.789	0	21.418	101.447	39.072	0	31.1	152.17	99.39	0	32.805
540	61.447	8.194	0	8.566	61.698	12.33	0	12.586	61.393	10.108	0	10.315	109.434	11.16	0	11.401	107.468	24.457	0	22.037	107.468	40.206	0	32.035	161.202	102.315	0	33.923
600	63.888	8.39	0	8.779	64.148	12.644	0	12.918	63.831	10.342	0	10.558	113.781	11.415	0	11.667	111.737	25.05	0	22.581	111.737	41.327	0	32.941	167.605	105.32	0	34.975
660	65.326	8.56	0	8.957	65.593	12.932	0	13.212	65.269	10.537	0	10.758	116.343	11.625	0	11.883	114.253	25.569	0	23.049	114.253	42.436	0	33.82	171.379	108.406	0	35.962
720	65.763	8.703	0	9.102	66.031	13.193	0	13.467	65.705	10.693	0	10.915	117.12	11.79	0	12.049	115.016	26.012	0	23.442	115.016	43.532	0	34.67	172.524	111.572	0	36.883

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	258.482	17.86	0	19.527	63.549	6.993	0	5.047	71.664	6.868	0	1.329	6.47	1.49	0	4.872	63.549	6.293	0	1.621	63.549	6.149	0	8.232	25.378	0.81	0	1.136
10	228.892	34.995	0	25.652	56.274	13.701	0	8.826	63.46	13.456	0	2.036	5.729	2.92	0	4.828	56.274	12.331	0	2.101	56.274	12.048	0	12.889	22.472	1.592	0	1.822
20	176.691	67.087	0	37.271	43.44	26.265	0	15.914	48.987	25.797	0	3.367	4.423	5.597	0	4.799	43.44	23.638	0	3.012	43.44	23.097	0	21.649	17.347	3.066	0	3.121
30	133.797	96.277	0	48.047	32.895	37.694	0	22.379	37.095	37.021	0	4.587	3.349	8.032	0	4.851	32.895	33.924	0	3.858	32.895	33.146	0	29.67	13.136	4.425	0	4.326
40	100.21	122.563	0	57.98	24.637	47.985	0	28.22	27.783	47.129	0	5.695	2.508	10.225	0	4.984	24.637	43.186	0	4.64	24.637	42.196	0	36.952	9.838	5.666	0	5.435
50	75.929	145.947	0	67.071	18.667	57.14	0	33.438	21.051	56.12	0	6.693	1.901	12.176	0	5.197	18.667	51.425	0	5.357	18.667	50.246	0	43.495	7.455	6.791	0	6.449
60	60.955	166.429	0	75.319	14.986	65.159	0	38.033	16.9	63.996	0	7.58	1.526	13.885	0	5.491	14.986	58.642	0	6.009	14.986	57.298	0	49.3	5.984	7.799	0	7.367
120	173.944	191.261	0	91.277	42.765	75.648	0	44.55	48.226	72.507	0	8.803	4.354	16.921	0	8.386	42.765	67.239	0	7.294	42.765	62.653	0	55.161	17.078	10.391	0	9.952
180	274.845	196.852	0	98.297	67.572	77.859	0	46.22	76.2	74.627	0	9.256	6.88	15.789	0	9.738	67.572	69.205	0	7.878	67.572	64.485	0	57.892	26.984	9.981	0	9.718
240	365.053	202.627	0	104.912	89.75	80.143	0	47.891	101.21	76.816	0	9.696	9.138	16.252	0	11.42	89.75	71.235	0	8.427	89.75	66.376	0	60.549	35.841	10.47	0	10.307
300	444.566	208.587	0	111.122	109.298	82.5	0	49.563	123.255	79.075	0	10.122	11.128	16.73	0	12.925	109.298	73.331	0	8.942	109.298	68.329	0	63.133	43.647	10.931	0	10.853
360	513.386	214.731	0	116.926	126.218	84.93	0	51.237	142.335	81.404	0	10.534	12.851	17.223	0	14.253	126.218	75.491	0	9.421	126.218	70.341	0	65.643	50.404	11.362	0	11.357
420	571.512	221.059	0	122.325	140.508	87.433	0	52.912	158.451	83.803	0	10.932	14.306	17.731	0	15.404	140.508	77.715	0	9.865	140.508	72.414	0	68.08	56.11	11.764	0	11.817
480	618.944	227.572	0	127.319	152.17	90.009	0	54.588	171.601	86.272	0	11.317	15.493	18.253	0	16.378	152.17	80.005	0	10.274	152.17	74.548	0	70.443	60.767	12.137	0	12.235
540	655.682	234.269	0	131.907	161.202	92.658	0	56.265	181.787	88.811	0	11.688	16.412	18.79	0	17.175	161.202	82.359	0	10.649	161.202	76.741	0	72.732	64.374	12.481	0	12.61
600	681.727	241.15	0	136.089	167.605	95.38	0	57.944	189.008	91.42	0	12.045	17.064	19.342	0	17.795	167.605	84.778	0	10.988	167.605	78.996	0	74.948	66.931	12.795	0	12.942
660	697.077	248.215	0	139.867	171.379	98.174	0	59.624	193.264	94.098	0	12.388	17.449	19.909	0	18.238	171.379	87.262	0	11.292	171.379	81.31	0	77.089	68.438	13.08	0	13.23
720	701.734	255.465	0	143.239	172.524	101.041	0	61.305	194.555	96.847	0	12.718	17.565	20.49	0	18.504	172.524	89.811	0	11.561	172.524	83.685	0	79.158	68.896	13.337	0	13.476

Pollutant Name: Oxides of Nitrogen   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	1.09	0.2	0	0.206	1.069	0.24	0	0.243	1.067	0.384	0	0.386	1.686	0.478	0	0.479	0.559	1.274	0	1.119	0.559	1.268	0	0.981	0.839	1.71	0	0.505
10	1.185	0.234	0	0.24	1.162	0.286	0	0.289	1.16	0.433	0	0.435	1.832	0.53	0	0.531	0.608	1.471	0	1.292	0.608	1.7	0	1.314	0.912	2.577	0	0.749
20	1.357	0.293	0	0.3	1.331	0.368	0	0.369	1.329	0.52	0	0.522	2.099	0.622	0	0.623	0.696	1.821	0	1.598	0.696	2.46	0	1.899	1.044	4.099	0	1.178
30	1.507	0.342	0	0.35	1.477	0.435	0	0.435	1.475	0.592	0	0.594	2.33	0.699	0	0.7	0.773	2.11	0	1.852	0.773	3.081	0	2.378	1.159	5.34	0	1.528
40	1.633	0.381	0	0.389	1.601	0.488	0	0.488	1.599	0.65	0	0.652	2.526	0.76	0	0.762	0.838	2.339	0	2.053	0.838	3.564	0	2.75	1.256	6.298	0	1.798
50	1.736	0.41	0	0.418	1.702	0.527	0	0.526	1.7	0.693	0	0.695	2.685	0.807	0	0.809	0.891	2.508	0	2.202	0.891	3.909	0	3.016	1.336	6.975	0	1.989
60	1.817	0.428	0	0.437	1.781	0.551	0	0.55	1.779	0.721	0	0.724	2.81	0.839	0	0.84	0.932	2.617	0	2.297	0.932	4.114	0	3.174	1.398	7.37	0	2.101
120	1.833	0.447	0	0.456	1.797	0.574	0	0.572	1.795	0.762	0	0.765	2.836	0.892	0	0.894	0.94	2.749	0	2.413	0.94	4.197	0	3.238	1.411	7.423	0	2.117
180	1.79	0.449	0	0.458	1.754	0.576	0	0.573	1.752	0.765	0	0.768	2.768	0.896	0	0.897	0.918	2.745	0	2.409	0.918	4.185	0	3.228	1.377	7.396	0	2.108
240	1.732	0.446	0	0.455	1.698	0.572	0	0.569	1.696	0.76	0	0.762	2.678	0.889	0	0.89	0.888	2.726	0	2.392	0.888	4.16	0	3.209	1.332	7.355	0	2.095
300	1.66	0.442	0	0.45	1.627	0.566	0	0.563	1.625	0.752	0	0.754	2.567	0.879	0	0.88	0.851	2.698	0	2.367	0.851	4.124	0	3.181	1.277	7.298	0	2.078
360	1.573	0.436	0	0.443	1.542	0.559	0	0.554	1.54	0.741	0	0.742	2.433	0.866	0	0.866	0.807	2.66	0	2.334	0.807	4.079	0	3.146	1.21	7.228	0	2.056
420	1.473	0.428	0	0.435	1.444	0.549	0	0.544	1.442	0.726	0	0.728	2.278	0.849	0	0.849	0.755	2.612	0	2.292	0.755	4.023	0	3.102	1.133	7.143	0	2.029
480	1.358	0.419	0	0.425	1.331	0.538	0	0.532	1.33	0.709	0	0.71	2.1	0.828	0	0.827	0.697	2.554	0	2.241	0.697	3.957	0	3.051	1.045	7.044	0	1.999
540	1.229	0.408	0	0.413	1.205	0.525	0	0.518	1.203	0.689	0	0.69	1.901	0.803	0	0.803	0.63	2.487	0	2.181	0.63	3.881	0	2.992	0.946	6.93	0	1.964
600	1.086	0.396	0	0.4	1.065	0.51	0	0.502	1.063	0.666	0	0.667	1.68	0.775	0	0.774	0.557	2.41	0	2.113	0.557	3.795	0	2.925	0.836	6.802	0	1.924
660	0.929	0.382	0	0.385	0.91	0.493	0	0.484	0.909	0.641	0	0.64	1.436	0.743	0	0.742	0.476	2.323	0	2.037	0.476	3.698	0	2.849	0.715	6.66	0	1.881
720	0.757	0.367	0	0.368	0.742	0.475	0	0.463	0.742	0.612	0	0.611	1.171	0.708	0	0.706	0.388	2.226	0	1.952	0.388	3.591	0	2.766	0.583	6.503	0	1.832

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	3.432	4.643	0	2.18	0.839	1.773	0	1.041	1.03	2.145	0	0.258	0.264	0.079	0	0.205	0.839	1.28	0	0.139	0.839	1.013	0	0.899	0.739	0.349	0	0.336
10	3.731	6.995	0	3.219	0.912	2.671	0	1.564	1.119	3.232	0	0.385	0.287	0.119	0	0.233	0.912	1.929	0	0.204	0.912	1.527	0	1.338	0.803	0.42	0	0.404
20	4.273	11.127	0	5.045	1.044	4.249	0	2.481	1.282	5.142	0	0.608	0.329	0.189	0	0.284	1.044	3.069	0	0.319	1.044	2.429	0	2.109	0.92	0.546	0	0.523
30	4.744	14.493	0	6.534	1.159	5.534	0	3.228	1.423	6.697	0	0.791	0.365	0.247	0	0.327	1.159	3.997	0	0.412	1.159	3.163	0	2.738	1.021	0.65	0	0.622
40	5.142	17.095	0	7.686	1.256	6.528	0	3.806	1.542	7.899	0	0.932	0.396	0.291	0	0.362	1.256	4.715	0	0.484	1.256	3.731	0	3.224	1.107	0.731	0	0.699
50	5.467	18.932	0	8.501	1.336	7.229	0	4.214	1.64	8.748	0	1.031	0.421	0.322	0	0.389	1.336	5.221	0	0.535	1.336	4.132	0	3.568	1.177	0.79	0	0.755
60	5.72	20.004	0	8.98	1.398	7.638	0	4.453	1.716	9.243	0	1.089	0.44	0.34	0	0.408	1.398	5.517	0	0.565	1.398	4.366	0	3.769	1.232	0.827	0	0.79
120	5.773	20.149	0	9.046	1.411	7.694	0	4.485	1.732	9.311	0	1.097	0.445	0.342	0	0.412	1.411	5.557	0	0.569	1.411	4.399	0	3.797	1.243	0.859	0	0.82
180	5.635	20.075	0	9.007	1.377	7.665	0	4.468	1.69	9.277	0	1.093	0.434	0.342	0	0.404	1.377	5.537	0	0.567	1.377	4.383	0	3.782	1.213	0.86	0	0.821
240	5.452	19.962	0	8.95	1.332	7.622	0	4.442	1.636	9.224	0	1.087	0.42	0.34	0	0.394	1.332	5.506	0	0.563	1.332	4.358	0	3.759	1.174	0.855	0	0.815
300	5.225	19.81	0	8.873	1.277	7.564	0	4.408	1.567	9.154	0	1.078	0.402	0.337	0	0.381	1.277	5.464	0	0.558	1.277	4.325	0	3.728	1.125	0.846	0	0.807
360	4.953	19.619	0	8.777	1.21	7.491	0	4.364	1.486	9.066	0	1.067	0.381	0.334	0	0.366	1.21	5.411	0	0.552	1.21	4.283	0	3.689	1.066	0.835	0	0.795
420	4.637	19.388	0	8.662	1.133	7.403	0	4.312	1.391	8.959	0	1.054	0.357	0.33	0	0.348	1.133	5.347	0	0.544	1.133	4.233	0	3.643	0.998	0.822	0	0.782
480	4.276	19.119	0	8.529	1.045	7.3	0	4.251	1.283	8.835	0	1.039	0.329	0.325	0	0.328	1.045	5.273	0	0.536	1.045	4.174	0	3.589	0.921	0.805	0	0.765
540	3.87	18.81	0	8.376	0.946	7.182	0	4.181	1.161	8.692	0	1.021	0.298	0.32	0	0.305	0.946	5.188	0	0.526	0.946	4.107	0	3.527	0.833	0.786	0	0.746
600	3.419	18.462	0	8.204	0.836	7.05	0	4.103	1.026	8.531	0	1.001	0.263	0.314	0	0.28	0.836	5.092	0	0.514	0.836	4.031	0	3.458	0.736	0.764	0	0.724
660	2.924	18.076	0	8.012	0.715	6.902	0	4.015	0.877	8.353	0	0.98	0.225	0.308	0	0.252	0.715	4.985	0	0.502	0.715	3.946	0	3.38	0.63	0.74	0	0.7
720	2.384	17.65	0	7.802	0.583	6.739	0	3.919	0.715	8.156	0	0.955	0.184	0.3	0	0.221	0.583	4.868	0	0.488	0.583	3.853	0	3.295	0.513	0.712	0	0.672

Pollutant Name: Carbon Dioxide   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	111.902	10.393	0	11.118	112.153	12.082	0	12.998	112.188	13.467	0	13.879	136.122	18.538	0	18.801	170.667	20.097	0	18.585	170.667	14.538	0	12.943	170.667	9.546	0	8.375
10	121.432	12.669	0	13.44	121.704	15.203	0	16.106	121.742	16.079	0	16.517	147.714	22.059	0	22.329	185.2	25.58	0	23.47	185.2	22.134	0	18.936	185.2	19.039	0	11.509
20	139.927	17.579	0	18.438	140.241	21.832	0	22.684	140.285	21.793	0	22.275	170.212	29.778	0	30.054	213.408	37.17	0	33.782	213.408	37.537	0	31.075	213.408	37.866	0	17.702
30	157.671	22.969	0	23.904	158.024	28.976	0	29.746	158.074	28.157	0	28.675	191.797	38.399	0	38.671	240.47	49.591	0	44.815	240.47	53.222	0	43.419	240.47	56.482	0	23.799
40	174.663	28.838	0	29.839	175.054	36.636	0	37.29	175.109	35.173	0	35.719	212.467	47.922	0	48.182	266.386	62.845	0	56.57	266.386	69.19	0	55.968	266.386	74.887	0	29.798
50	190.904	35.187	0	36.244	191.331	44.811	0	45.319	191.391	42.839	0	43.406	232.222	58.349	0	58.585	291.155	76.93	0	69.046	291.155	85.44	0	68.723	291.155	93.081	0	35.699
60	206.393	42.015	0	43.117	206.855	53.502	0	53.83	206.92	51.156	0	51.736	251.064	69.678	0	69.881	314.778	91.848	0	82.245	314.778	101.972	0	81.683	314.778	111.063	0	41.504
120	279.29	89.5	0	90.658	279.915	110.903	0	109.667	280.003	111.132	0	111.629	339.738	151.891	0	151.709	425.955	188.675	0	167.672	425.955	188.793	0	149.611	425.955	188.899	0	66.927
180	279.509	102.643	0	103.668	280.135	127.61	0	125.647	280.223	127.155	0	127.543	340.005	173.721	0	173.367	426.29	217.337	0	192.771	426.29	220.411	0	173.934	426.29	223.17	0	76.493
240	279.729	115.528	0	116.423	280.355	143.901	0	141.231	280.443	142.926	0	143.207	340.272	195.222	0	194.698	426.625	245.24	0	217.205	426.625	250.603	0	197.161	426.625	255.419	0	85.495
300	279.948	128.156	0	128.923	280.575	159.779	0	156.418	280.663	158.444	0	158.619	340.539	216.393	0	215.702	426.96	272.384	0	240.975	426.96	279.371	0	219.291	426.96	285.644	0	93.933
360	280.167	140.526	0	141.169	280.795	175.242	0	171.209	280.883	173.709	0	173.781	340.806	237.235	0	236.379	427.294	298.768	0	264.079	427.294	306.713	0	240.326	427.294	313.847	0	101.807
420	280.387	152.639	0	153.159	281.015	190.291	0	185.604	281.103	188.722	0	188.691	341.073	257.747	0	256.729	427.629	324.393	0	286.518	427.629	332.63	0	260.264	427.629	340.027	0	109.118
480	280.606	164.494	0	164.895	281.235	204.925	0	199.603	281.323	203.481	0	203.35	341.34	277.928	0	276.752	427.964	349.258	0	308.293	427.964	357.122	0	279.106	427.964	364.184	0	115.864
540	280.826	176.091	0	176.375	281.455	219.146	0	213.206	281.543	217.988	0	217.758	341.607	297.781	0	296.447	428.299	373.364	0	329.402	428.299	380.19	0	296.852	428.299	386.319	0	122.046
600	281.045	187.431	0	187.601	281.675	232.952	0	226.412	281.763	232.242	0	231.915	341.874	317.303	0	315.816	428.633	396.71	0	349.846	428.633	401.832	0	313.502	428.633	406.43	0	127.665
660	281.265	198.514	0	198.571	281.895	246.343	0	239.222	281.983	246.243	0	245.821	342.141	336.496	0	334.857	428.968	419.297	0	369.626	428.968	422.049	0	329.056	428.968	424.519	0	132.719
720	281.484	209.338	0	209.287	282.115	259.321	0	251.636	282.203	259.991	0	259.476	342.408	355.359	0	353.572	429.303	441.124	0	388.74	429.303	440.84	0	343.514	429.303	440.586	0	137.21

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	170.667	9.546	0	11.913	170.667	9.546	0	8.199	170.667	9.546	0	2.372	34.354	1.793	0	23.908	170.667	9.546	0	3.629	170.667	9.546	0	16.2	88.482	12.065	0	12.583
10	185.2	19.039	0	16.712	185.2	19.039	0	13.932	185.2	19.039	0	3.585	37.279	3.577	0	26.467	185.2	19.039	0	4.793	185.2	19.039	0	24.94	96.017	14.927	0	15.366
20	213.408	37.866	0	26.2	213.408	37.866	0	25.294	213.408	37.866	0	5.986	42.957	7.114	0	31.458	213.408	37.866	0	7.091	213.408	37.866	0	42.245	110.642	21.052	0	21.301
30	240.47	56.482	0	35.545	240.47	56.482	0	36.516	240.47	56.482	0	8.355	48.405	10.612	0	36.28	240.47	56.482	0	9.35	240.47	56.482	0	59.317	124.672	27.716	0	27.729
40	266.386	74.887	0	44.745	266.386	74.887	0	47.596	266.386	74.887	0	10.69	53.621	14.069	0	40.932	266.386	74.887	0	11.571	266.386	74.887	0	76.155	138.108	34.916	0	34.649
50	291.155	93.081	0	53.801	291.155	93.081	0	58.537	291.155	93.081	0	12.992	58.607	17.487	0	45.415	291.155	93.081	0	13.752	291.155	93.081	0	92.759	150.949	42.654	0	42.062
60	314.778	111.063	0	62.713	314.778	111.063	0	69.337	314.778	111.063	0	15.262	63.362	20.866	0	49.729	314.778	111.063	0	15.895	314.778	111.063	0	109.13	163.197	50.929	0	49.967
120	425.955	188.899	0	101.694	425.955	188.899	0	116.224	425.955	188.899	0	25.15	85.741	35.489	0	69.619	425.955	188.899	0	25.31	425.955	188.899	0	180.414	220.837	107.069	0	103.217
180	426.29	223.17	0	116.649	426.29	223.17	0	136.109	426.29	223.17	0	29.145	85.809	41.928	0	71.731	426.29	223.17	0	28.689	426.29	223.17	0	209.492	221.01	122.987	0	118.073
240	426.625	255.419	0	130.722	426.625	255.419	0	154.822	426.625	255.419	0	32.904	85.876	47.986	0	73.72	426.625	255.419	0	31.869	426.625	255.418	0	236.854	221.184	138.552	0	132.6
300	426.96	285.644	0	143.913	426.96	285.644	0	172.361	426.96	285.644	0	36.428	85.943	53.665	0	75.588	426.96	285.644	0	34.85	426.96	285.644	0	262.501	221.358	153.765	0	146.799
360	427.294	313.847	0	156.223	427.295	313.847	0	188.727	427.294	313.847	0	39.716	86.011	58.964	0	77.334	427.294	313.847	0	37.632	427.295	313.847	0	286.433	221.531	168.626	0	160.669
420	427.629	340.027	0	167.651	427.629	340.027	0	203.919	427.629	340.027	0	42.768	86.078	63.882	0	78.957	427.629	340.027	0	40.214	427.629	340.027	0	308.65	221.705	183.134	0	174.211
480	427.964	364.184	0	178.197	427.964	364.184	0	217.938	427.964	364.184	0	45.585	86.146	68.421	0	80.459	427.964	364.184	0	42.598	427.964	364.184	0	329.151	221.878	197.291	0	187.423
540	428.299	386.319	0	187.861	428.299	386.319	0	230.784	428.299	386.319	0	48.166	86.213	72.579	0	81.839	428.299	386.319	0	44.782	428.299	386.318	0	347.937	222.052	211.095	0	200.308
600	428.633	406.43	0	196.643	428.633	406.43	0	242.456	428.633	406.43	0	50.511	86.28	76.358	0	83.097	428.633	406.43	0	46.768	428.633	406.43	0	365.007	222.225	224.548	0	212.863
660	428.968	424.519	0	204.544	428.968	424.519	0	252.954	428.968	424.519	0	52.621	86.348	79.756	0	84.233	428.968	424.519	0	48.554	428.968	424.519	0	380.363	222.399	237.648	0	225.09
720	429.303	440.586	0	211.563	429.303	440.586	0	262.28	429.303	440.586	0	54.495	86.415	82.774	0	85.247	429.303	440.586	0	50.141	429.303	440.585	0	394.003	222.572	250.396	0	236.989

Pollutant Name: Sulfur Dioxide   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.003	0	0	0
10	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.003	0	0	0	0.003	0	0	0	0.003	0	0	0
20	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.003	0	0	0	0.003	0.001	0	0	0.003	0.001	0	0
30	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0
40	0.002	0	0	0	0.002	0	0	0	0.002	0	0	0	0.002	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.002	0	0.001
50	0.002	0	0	0	0.002	0.001	0	0.001	0.002	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.002	0	0.001
60	0.002	0	0	0.001	0.002	0.001	0	0.001	0.002	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.004	0.002	0	0.001
120	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.004	0.002	0	0.002	0.005	0.002	0	0.002	0.005	0.002	0	0.002	0.005	0.003	0	0.001
180	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0.001	0.004	0.002	0	0.002	0.005	0.002	0	0.002	0.005	0.003	0	0.002	0.005	0.004	0	0.001
240	0.003	0.001	0	0.001	0.003	0.002	0	0.002	0.003	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.003	0	0.002	0.005	0.003	0	0.002	0.006	0.004	0	0.001
300	0.003	0.001	0	0.001	0.003	0.002	0	0.002	0.003	0.002	0	0.002	0.005	0.002	0	0.002	0.005	0.003	0	0.003	0.005	0.003	0	0.003	0.006	0.004	0	0.001
360	0.004	0.001	0	0.001	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.002	0	0.002	0.006	0.003	0	0.003	0.006	0.004	0	0.003	0.006	0.005	0	0.001
420	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.003	0	0.003	0.006	0.004	0	0.003	0.006	0.004	0	0.003	0.007	0.005	0	0.002
480	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.003	0	0.003	0.006	0.004	0	0.003	0.006	0.004	0	0.003	0.007	0.005	0	0.002
540	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.003	0	0.003	0.006	0.004	0	0.004	0.006	0.004	0	0.003	0.007	0.005	0	0.002
600	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.004	0.002	0	0.002	0.005	0.003	0	0.003	0.006	0.004	0	0.004	0.006	0.005	0	0.004	0.007	0.006	0	0.002
660	0.004	0.002	0	0.002	0.004	0.003	0	0.003	0.004	0.003	0	0.003	0.005	0.003	0	0.003	0.006	0.004	0	0.004	0.006	0.005	0	0.004	0.007	0.006	0	0.002
720	0.004	0.002	0	0.002	0.004	0.003	0	0.003	0.004	0.003	0	0.003	0.005	0.004	0	0.004	0.006	0.005	0	0.004	0.006	0.005	0	0.004	0.007	0.006	0	0.002

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	0.006	0	0	0	0.003	0	0	0	0.003	0	0	0	0	0	0.193	0	0.003	0	0	0	0.003	0	0	0	0.001	0	0	0
10	0.006	0.001	0	0.001	0.003	0	0	0	0.003	0	0	0	0	0	0.193	0	0.003	0	0	0	0.003	0	0	0	0.001	0	0	0
20	0.005	0.002	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0	0.001	0	0.193	0	0.003	0.001	0	0	0.003	0.001	0	0.001	0.001	0	0	0
30	0.005	0.002	0	0.001	0.003	0.001	0	0.001	0.003	0.001	0	0	0.001	0	0.193	0	0.003	0.001	0	0	0.003	0.001	0	0.001	0.001	0	0	0
40	0.005	0.003	0	0.001	0.003	0.002	0	0.001	0.003	0.002	0	0	0.001	0	0.193	0.001	0.003	0.001	0	0	0.003	0.001	0	0.001	0.002	0	0	0
50	0.004	0.003	0	0.002	0.003	0.002	0	0.001	0.003	0.002	0	0	0.001	0	0.193	0.001	0.003	0.002	0	0	0.003	0.002	0	0.002	0.002	0.001	0	0.001
60	0.004	0.004	0	0.002	0.004	0.002	0	0.001	0.004	0.002	0	0	0.001	0	0.193	0.001	0.004	0.002	0	0	0.004	0.002	0	0.002	0.002	0.001	0	0.001
120	0.007	0.005	0	0.003	0.005	0.003	0	0.002	0.005	0.003	0	0	0.001	0.001	0.193	0.001	0.005	0.003	0	0	0.005	0.003	0	0.003	0.003	0.001	0	0.001
180	0.009	0.006	0	0.003	0.005	0.003	0	0.002	0.006	0.003	0	0	0.001	0.001	0.193	0.001	0.005	0.003	0	0	0.005	0.003	0	0.003	0.003	0.001	0	0.001
240	0.01	0.006	0	0.003	0.006	0.004	0	0.002	0.006	0.004	0	0	0.001	0.001	0.193	0.001	0.006	0.004	0	0	0.006	0.004	0	0.003	0.003	0.002	0	0.001
300	0.011	0.006	0	0.003	0.006	0.004	0	0.002	0.006	0.004	0	0.001	0.001	0.001	0.193	0.001	0.006	0.004	0	0	0.006	0.004	0	0.004	0.003	0.002	0	0.002
360	0.013	0.007	0	0.004	0.006	0.004	0	0.003	0.007	0.004	0	0.001	0.001	0.001	0.193	0.001	0.006	0.004	0	0.001	0.006	0.004	0	0.004	0.003	0.002	0	0.002
420	0.013	0.007	0	0.004	0.007	0.005	0	0.003	0.007	0.005	0	0.001	0.001	0.001	0.193	0.001	0.007	0.005	0	0.001	0.007	0.004	0	0.004	0.003	0.002	0	0.002
480	0.014	0.007	0	0.004	0.007	0.005	0	0.003	0.007	0.005	0	0.001	0.001	0.001	0.193	0.001	0.007	0.005	0	0.001	0.007	0.005	0	0.004	0.003	0.002	0	0.002
540	0.015	0.008	0	0.004	0.007	0.005	0	0.003	0.007	0.005	0	0.001	0.001	0.001	0.193	0.001	0.007	0.005	0	0.001	0.007	0.005	0	0.005	0.003	0.002	0	0.002
600	0.015	0.008	0	0.004	0.007	0.006	0	0.003	0.008	0.005	0	0.001	0.001	0.001	0.193	0.001	0.007	0.005	0	0.001	0.007	0.005	0	0.005	0.003	0.002	0	0.002
660	0.016	0.008	0	0.004	0.007	0.006	0	0.003	0.008	0.006	0	0.001	0.001	0.001	0.193	0.001	0.007	0.006	0	0.001	0.007	0.005	0	0.005	0.003	0.003	0	0.002
720	0.016	0.009	0	0.005	0.007	0.006	0	0.004	0.008	0.006	0	0.001	0.001	0.001	0.193	0.001	0.007	0.006	0	0.001	0.007	0.006	0	0.005	0.003	0.003	0	0.003

Pollutant Name: PM10   Temperature: 70F   Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL
5	0.011	0.001	0	0.001	0.011	0.001	0	0.001	0.011	0.001	0	0.001	0.012	0.001	0	0.001	0.011	0.001	0	0.001	0.011	0.001	0	0.001	0.011	0.001	0	0.001
10	0.01	0.001	0	0.001	0.01	0.002	0	0.002	0.01	0.002	0	0.002	0.01	0.002	0	0.002	0.01	0.001	0	0.001	0.01	0.002	0	0.002	0.01	0.003	0	0.001
20	0.008	0.002	0	0.002	0.008	0.003	0	0.003	0.008	0.005	0	0.005	0.008	0.005	0	0.005	0.008	0.002	0	0.002	0.008	0.004	0	0.003	0.008	0.005	0	0.002
30	0.006	0.003	0	0.003	0.006	0.004	0	0.004	0.006	0.007	0	0.007	0.006	0.007	0	0.007	0.006	0.003	0	0.003	0.006	0.006	0	0.005	0.006	0.007	0	0.002
40	0.004	0.004	0	0.004	0.004	0.006	0	0.006	0.004	0.009	0	0.009	0.004	0.009	0	0.009	0.004	0.004	0	0.003	0.004	0.008	0	0.006	0.004	0.009	0	0.003
50	0.003	0.005	0	0.005	0.003	0.007	0	0.007	0.003	0.011	0	0.011	0.003	0.01	0	0.01	0.003	0.005	0	0.004	0.003	0.009	0	0.007	0.003	0.011	0	0.003
60	0.003	0.006	0	0.006	0.003	0.008	0	0.008	0.003	0.012	0	0.012	0.003	0.012	0	0.012	0.003	0.005	0	0.005	0.003	0.01	0	0.008	0.003	0.012	0	0.004
120	0.007	0.008	0	0.008	0.007	0.012	0	0.011	0.007	0.019	0	0.018	0.007	0.018	0	0.018	0.007	0.008	0	0.007	0.007	0.014	0	0.011	0.007	0.017	0	0.005
180	0.011	0.009	0	0.009	0.011	0.012	0	0.012	0.011	0.02	0	0.02	0.012	0.02	0	0.02	0.011	0.008	0	0.007	0.011	0.015	0	0.011	0.011	0.017	0	0.005
240	0.015	0.01	0	0.01	0.015	0.013	0	0.013	0.015	0.021	0	0.021	0.015	0.021	0	0.021	0.015	0.009	0	0.008	0.015	0.015	0	0.012	0.015	0.018	0	0.006
300	0.018	0.01	0	0.01	0.018	0.014	0	0.013	0.019	0.022	0	0.022	0.019	0.022	0	0.022	0.018	0.009	0	0.008	0.018	0.016	0	0.012	0.018	0.019	0	0.006
360	0.021	0.011	0	0.011	0.021	0.014	0	0.014	0.021	0.023	0	0.023	0.022	0.023	0	0.023	0.021	0.009	0	0.008	0.021	0.016	0	0.013	0.021	0.019	0	0.006
420	0.023	0.011	0	0.011	0.023	0.015	0	0.014	0.024	0.024	0	0.024	0.024	0.024	0	0.024	0.023	0.01	0	0.009	0.023	0.017	0	0.013	0.023	0.02	0	0.006
480	0.025	0.011	0	0.011	0.025	0.015	0	0.015	0.026	0.025	0	0.025	0.026	0.025	0	0.025	0.025	0.01	0	0.009	0.025	0.017	0	0.014	0.025	0.02	0	0.006
540	0.027	0.012	0	0.012	0.026	0.016	0	0.015	0.027	0.026	0	0.026	0.028	0.026	0	0.025	0.027	0.01	0	0.009	0.027	0.018	0	0.014	0.027	0.021	0	0.007
600	0.028	0.012	0	0.012	0.027	0.016	0	0.016	0.028	0.027	0	0.026	0.029	0.026	0	0.026	0.028	0.011	0	0.009	0.028	0.018	0	0.014	0.028	0.021	0	0.007
660	0.029	0.012	0	0.012	0.028	0.016	0	0.016	0.029	0.027	0	0.027	0.029	0.027	0	0.026	0.029	0.011	0	0.01	0.029	0.019	0	0.015	0.029	0.022	0	0.007
720	0.029	0.012	0	0.012	0.028	0.017	0	0.016	0.029	0.027	0	0.027	0.03	0.027	0	0.027	0.029	0.011	0	0.01	0.029	0.019	0	0.015	0.029	0.023	0	0.007

Time min	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
5	0.011	0.002	0	0.001	0.011	0.001	0	0.001	0.011	0.001	0	0	0.02	0	0	0.013	0.011	0.001	0	0	0.011	0	0	0.001	0.015	0.001	0	0.001
10	0.01	0.004	0	0.002	0.01	0.003	0	0.002	0.01	0.003	0	0	0.017	0	0	0.012	0.01	0.002	0	0	0.01	0.001	0	0.001	0.013	0.002	0	0.002
20	0.008	0.007	0	0.003	0.008	0.005	0	0.003	0.008	0.006	0	0.001	0.013	0.001	0	0.009	0.008	0.003	0	0	0.008	0.001	0	0.001	0.01	0.003	0	0.003
30	0.006	0.01	0	0.004	0.006	0.007	0	0.004	0.006	0.008	0	0.001	0.01	0.001	0	0.007	0.006	0.005	0	0.001	0.006	0.002	0	0.002	0.008	0.004	0	0.004
40	0.004	0.012	0	0.006	0.004	0.009	0	0.006	0.004	0.01	0	0.001	0.008	0.001	0	0.006	0.004	0.006	0	0.001	0.004	0.002	0	0.002	0.006	0.006	0	0.005
50	0.003	0.015	0	0.007	0.003	0.011	0	0.007	0.003	0.012	0	0.001	0.006	0.002	0	0.004	0.003	0.008	0	0.001	0.003	0.003	0	0.002	0.004	0.007	0	0.006
60	0.003	0.017	0	0.007	0.003	0.013	0	0.007	0.003	0.014	0	0.002	0.005	0.002	0	0.004	0.003	0.009	0	0.001	0.003	0.003	0	0.003	0.003	0.008	0	0.007
120	0.007	0.023	0	0.01	0.007	0.017	0	0.01	0.007	0.019	0	0.002	0.013	0.002	0	0.009	0.007	0.012	0	0.001	0.007	0.004	0	0.004	0.009	0.012	0	0.011
180	0.011	0.024	0	0.011	0.011	0.018	0	0.011	0.011	0.019	0	0.002	0.02	0.002	0	0.014	0.011	0.012	0	0.001	0.011	0.004	0	0.004	0.015	0.012	0	0.012
240	0.015	0.024	0	0.011	0.015	0.019	0	0.011	0.015	0.02	0	0.002	0.026	0.002	0	0.019	0.015	0.013	0	0.001	0.015	0.004	0	0.004	0.02	0.013	0	0.013
300	0.018	0.025	0	0.012	0.018	0.019	0	0.011	0.018	0.021	0	0.003	0.032	0.003	0	0.023	0.018	0.013	0	0.002	0.018	0.004	0	0.005	0.024	0.014	0	0.013
360	0.021	0.026	0	0.012	0.021	0.02	0	0.012	0.021	0.021	0	0.003	0.037	0.003	0	0.026	0.021	0.013	0	0.002	0.021	0.005	0	0.005	0.028	0.015	0	0.014
420	0.023	0.027	0	0.013	0.023	0.02	0	0.012	0.023	0.022	0	0.003	0.041	0.003	0	0.029	0.023	0.014	0	0.002	0.023	0.005	0	0.005	0.031	0.015	0	0.015
480	0.025	0.027	0	0.013	0.025	0.021	0	0.012	0.025	0.022	0	0.003	0.045	0.003	0	0.031	0.025	0.014	0	0.002	0.025	0.005	0	0.005	0.034	0.016	0	0.015
540	0.027	0.028	0	0.013	0.027	0.021	0	0.013	0.027	0.023	0	0.003	0.047	0.003	0	0.033	0.027	0.014	0	0.002	0.027	0.005	0	0.005	0.036	0.016	0	0.015
600	0.028	0.029	0	0.014	0.028	0.022	0	0.013	0.028	0.024	0	0.003	0.049	0.003	0	0.034	0.028	0.015	0	0.002	0.028	0.005	0	0.006	0.037	0.016	0	0.016
660	0.029	0.03	0	0.014	0.029	0.023	0	0.014	0.029	0.024	0	0.003	0.05	0.003	0	0.035	0.029	0.015	0	0.002	0.029	0.005	0	0.006	0.038	0.017	0	0.016
720	0.029	0.031	0	0.015	0.029	0.023	0	0.014	0.029	0.025	0	0.003	0.051	0.003	0	0.035	0.029	0.016	0	0.002	0.029	0.005	0	0.006	0.038	0.017	0	0.016

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****

Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
min	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	1.048	0.062	0	0.069	1.059	0.08	0	0.09	1.06	0.051	0	0.056	0.482	0.039	0	0.04	0.45	0.019	0	0.019	0.45	0.047	0	0.041	0.26	0.019	0	0.014	0.261	0.019	0	0.02	0.26	0.012	0	0.011	1.089	0.151	0	0.026	0.119	0.245	0	0.159	0.261	0.028	0	0.007	0.26	0.071	0	0.072	0.536	0.059	0	0.063
10	1.93	0.115	0	0.128	1.95	0.148	0	0.167	1.952	0.095	0	0.103	0.888	0.073	0	0.075	0.829	0.035	0	0.035	0.829	0.088	0	0.076	0.479	0.036	0	0.026	0.48	0.035	0	0.037	0.479	0.023	0	0.021	2.005	0.28	0	0.047	0.22	0.457	0	0.296	0.48	0.052	0	0.013	0.478	0.131	0	0.133	0.988	0.109	0	0.117
20	3.276	0.198	0	0.22	3.31	0.255	0	0.286	3.313	0.163	0	0.177	1.508	0.126	0	0.129	1.407	0.06	0	0.061	1.407	0.151	0	0.131	0.812	0.063	0	0.045	0.815	0.062	0	0.064	0.813	0.04	0	0.036	3.402	0.478	0	0.081	0.374	0.799	0	0.51	0.815	0.091	0	0.022	0.811	0.223	0	0.227	1.677	0.187	0	0.2
30	4.183	0.256	0	0.284	4.226	0.33	0	0.37	4.23	0.212	0	0.229	1.925	0.163	0	0.168	1.797	0.079	0	0.079	1.796	0.197	0	0.17	1.037	0.084	0	0.058	1.041	0.083	0	0.083	1.038	0.052	0	0.046	4.344	0.614	0	0.104	0.478	1.054	0	0.663	1.04	0.118	0	0.028	1.035	0.286	0	0.292	2.141	0.243	0	0.258
40	4.513	0.277	0	0.308	4.558	0.359	0	0.402	4.563	0.23	0	0.249	2.076	0.178	0	0.183	1.938	0.086	0	0.086	1.938	0.215	0	0.185	1.119	0.092	0	0.063	1.123	0.091	0	0.091	1.119	0.057	0	0.05	4.685	0.666	0	0.112	0.517	1.157	0	0.722	1.122	0.129	0	0.03	1.117	0.31	0	0.316	2.31	0.264	0	0.281

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****

Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
degF	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
70	1.164	0.126	0	0.138	1.143	0.178	0	0.191	1.143	0.106	0	0.113	0.532	0.079	0	0.081	0.059	0.005	0	0.004	0.059	0.013	0	0.008	0.057	0.013	0	0.004	0.057	0.009	0	0.001	0.057	0.006	0	0.003	0.05	0.009	0	0.001	0.138	0.765	0	0.339	0.059	0.013	0	0.002	0.061	0.023	0	0.022	0.465	0.13	0	0.138

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****

Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 5b: Multi-Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
degF	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
70	0.07	0.011	0	0.011	0.068	0.015	0	0.015	0.068	0.009	0	0.009	0.032	0.006	0	0.006	0.002	0	0	0	0.002	0.001	0	0	0.002	0.001	0	0	0.002	0	0	0	0.002	0	0	0	0.012	0.002	0	0	0.008	0.072	0	0.029	0.002	0.001	0	0	0.003	0.001	0	0.001	0.028	0.011	0	0.011

Table B-16
BAAQMD EMFAC2007
Dry Fermentation Anaerobic Digestion Facility Project

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 6a: Partial Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
70	0.566	0.048	0	0.054	0.561	0.068	0	0.076	0.564	0.043	0	0.047	0.267	0.036	0	0.037	0.032	0.002	0	0.002	0.032	0.006	0	0.003	0.03	0.006	0	0.002	0.03	0.006	0	0.001	0.03	0.003	0	0.002	0.026	0.004	0	0.001	0.065	0.225	0	0.116	0.031	0.006	0	0.001	0.032	0.011	0	0.011	0.225	0.05	0	0.054

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 6b: Multi-Day Resting Loss Emissions (grams/hour

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
70	0.036	0.004	0	0.004	0.035	0.006	0	0.006	0.036	0.003	0	0.004	0.017	0.003	0	0.003	0.001	0	0	0	0.001	0	0	0	0.001	0	0	0	0.001	0	0	0	0.001	0	0	0	0.006	0.001	0	0	0.004	0.023	0	0.01	0.001	0	0	0	0.001	0	0	0	0.014	0.004	0	0.004

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
%VMT	0.003	0.526	0.001	0.531	0.002	0.123	0.004	0.128	0.001	0.2	0	0.201	0	0.072	0	0.073	0	0.008	0.003	0.012	0	0.004	0.003	0.007	0	0.002	0.013	0.016	0	0.001	0.017	0.018	0	0.001	0.001	0.001	0	0	0.003	0.004	0.005	0.003	0	0.008	0	0	0.001	0.001	0	0.002	0	0.002	0.011	0.942	0.047	1
%TRIP	0.004	0.512	0.001	0.518	0.002	0.114	0.004	0.119	0.001	0.179	0	0.18	0	0.059	0	0.06	0	0.032	0.004	0.036	0	0.017	0.005	0.022	0.002	0.013	0.032	0.046	0	0.002	0.003	0.005	0	0.002	0.002	0.004	0	0	0	0.001	0.006	0.003	0	0.009	0	0	0.001	0.001	0	0	0	0	0.015	0.933	0.052	1
%VEH	0.006	0.542	0.002	0.551	0.003	0.122	0.004	0.129	0.001	0.188	0	0.19	0	0.062	0	0.063	0	0.006	0.002	0.009	0	0.003	0.003	0.006	0	0.002	0.008	0.01	0	0	0.003	0.004	0	0	0	0.001	0	0	0.001	0.001	0.021	0.01	0	0.031	0	0	0.001	0.001	0	0.005	0.001	0.006	0.032	0.943	0.025	1

Title : Dry Fermentation Anaerobic Digestion Facility
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/05/29 18:26:51
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Annual
Area : Bay Area AQMD
****
Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Bay Area AQMD

Table 8: Evaporative Running Loss Emissions (grams/minute

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time min	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
1	1.543	0.015	0	0.024	1.639	0.645	0	0.64	1.635	0.372	0	0.377	0.731	0.236	0	0.236	1.628	0.271	0	0.204	1.574	0.846	0	0.48	1.646	0.435	0	0.072	2.656	0.426	0	0.022	1.697	0.243	0	0.103	3.48	1.34	0	0.181	0.131	0.002	0	0.081	1.844	0.833	0	0.112	1.183	2.407	0	2.098	0.952	0.202	0	0.201
2	1.438	0.019	0	0.028	1.184	0.332	0	0.333	1.161	0.191	0	0.195	0.491	0.122	0	0.123	1.085	0.145	0	0.11	1.047	0.449	0	0.256	1.197	0.24	0	0.041	1.762	0.236	0	0.013	1.207	0.13	0	0.056	2.064	0.709	0	0.098	0.132	0.097	0	0.119	1.378	0.449	0	0.066	0.866	1.276	0	1.122	0.798	0.111	0	0.113
3	1.404	0.023	0	0.032	1.033	0.23	0	0.234	1.004	0.133	0	0.137	0.412	0.086	0	0.086	0.904	0.105	0	0.079	0.871	0.319	0	0.182	1.047	0.177	0	0.031	1.464	0.175	0	0.009	1.044	0.094	0	0.041	1.592	0.5	0	0.07	0.134	0.146	0	0.138	1.223	0.322	0	0.051	0.761	0.902	0	0.798	0.747	0.083	0	0.087
4	1.387	0.027	0	0.035	0.957	0.181	0	0.186	0.925	0.106	0	0.109	0.372	0.069	0	0.07	0.813	0.085	0	0.065	0.783	0.255	0	0.146	0.973	0.146	0	0.026	1.316	0.145	0	0.008	0.963	0.078	0	0.034	1.357	0.397	0	0.056	0.135	0.173	0	0.15	1.146	0.26	0	0.044	0.714	0.717	0	0.639	0.723	0.071	0	0.075
5	1.377	0.029	0	0.038	0.912	0.152	0	0.157	0.878	0.089	0	0.093	0.348	0.059	0	0.06	0.759	0.074	0	0.056	0.731	0.218	0	0.125	0.928	0.128	0	0.023	1.227	0.128	0	0.007	0.914	0.069	0	0.03	1.216	0.336	0	0.048	0.137	0.191	0	0.158	1.1	0.223	0	0.039	0.687	0.608	0	0.544	0.708	0.064	0	0.068
10	1.36	0.035	0	0.043	0.823	0.098	0	0.105	0.786	0.06	0	0.063	0.301	0.042	0	0.043	0.652	0.052	0	0.04	0.627	0.146	0	0.084	0.841	0.095	0	0.017	1.051	0.094	0	0.005	0.818	0.053	0	0.023	0.934	0.215	0	0.032	0.146	0.228	0	0.178	1.01	0.151	0	0.031	0.635	0.391	0	0.358	0.683	0.051	0	0.056
15	1.357	0.038	0	0.046	0.795	0.084	0	0.091	0.756	0.053	0	0.056	0.286	0.039	0	0.039	0.617	0.047	0	0.036	0.593	0.125	0	0.073	0.813	0.087	0	0.016	0.994	0.083	0	0.005	0.788	0.049	0	0.022	0.842	0.177	0	0.027	0.155	0.241	0	0.188	0.982	0.129	0	0.028	0.619	0.323	0	0.299	0.678	0.049	0	0.054
20	1.357	0.039	0	0.047	0.782	0.081	0	0.088	0.742	0.052	0	0.055	0.278	0.039	0	0.039	0.601	0.045	0	0.035	0.577	0.118	0	0.069	0.8	0.085	0	0.016	0.966	0.079	0	0.004	0.774	0.049	0	0.022	0.797	0.16	0	0.025	0.163	0.247	0	0.195	0.969	0.12	0	0.027	0.612	0.292	0	0.272	0.678	0.049	0	0.054
25	1.359	0.04	0	0.049	0.775	0.081	0	0.088	0.735	0.053	0	0.056	0.274	0.04	0	0.04	0.591	0.045	0	0.035	0.568	0.116	0	0.067	0.793	0.085	0	0.016	0.951	0.077	0	0.004	0.766	0.05	0	0.022	0.77	0.151	0	0.023	0.171	0.251	0	0.202	0.962	0.115	0	0.027	0.608	0.275	0	0.258	0.68	0.05	0	0.055
30	1.362	0.041	0	0.049	0.777	0.081	0	0.088	0.737	0.053	0	0.056	0.275	0.04	0	0.04	0.593	0.046	0	0.035	0.569	0.117	0	0.068	0.795	0.086	0	0.016	0.954	0.077	0	0.004	0.768	0.05	0	0.022	0.772	0.152	0	0.023	0.171	0.252	0	0.202	0.965	0.116	0	0.027	0.61	0.276	0	0.259	0.682	0.05	0	0.055
35	1.365	0.041	0	0.049	0.779	0.082	0	0.088	0.739	0.053	0	0.056	0.276	0.04	0	0.04	0.594	0.046	0	0.035	0.571	0.117	0	0.068	0.797	0.086	0	0.016	0.956	0.077	0	0.004	0.77	0.05	0	0.022	0.775	0.152	0	0.023	0.172	0.252	0	0.203	0.967	0.116	0	0.027	0.611	0.277	0	0.259	0.683	0.05	0	0.055
40	1.368	0.041	0	0.049	0.781	0.082	0	0.089	0.74	0.053	0	0.056	0.276	0.04	0	0.04	0.596	0.046	0	0.035	0.572	0.117	0	0.068	0.799	0.086	0	0.016	0.958	0.078	0	0.004	0.772	0.05	0	0.022	0.777	0.153	0	0.023	0.172	0.253	0	0.203	0.969	0.116	0	0.027	0.613	0.278	0	0.26	0.685	0.05	0	0.055
45	1.371	0.041	0	0.049	0.783	0.082	0	0.089	0.742	0.053	0	0.056	0.277	0.04	0	0.041	0.597	0.046	0	0.035	0.573	0.117	0	0.068	0.801	0.086	0	0.016	0.96	0.078	0	0.004	0.773	0.05	0	0.022	0.778	0.153	0	0.024	0.173	0.253	0	0.203	0.972	0.117	0	0.027	0.614	0.278	0	0.261	0.686	0.05	0	0.055
50	1.345	0.04	0	0.049	0.777	0.082	0	0.089	0.737	0.053	0	0.056	0.275	0.04	0	0.041	0.594	0.046	0	0.035	0.571	0.118	0	0.068	0.794	0.086	0	0.016	0.952	0.078	0	0.004	0.768	0.051	0	0.022	0.776	0.153	0	0.024	0.169	0.254	0	0.201	0.962	0.117	0	0.027	0.613	0.279	0	0.261	0.676	0.05	0	0.055
55	1.308	0.04	0	0.048	0.767	0.082	0	0.089	0.729	0.053	0	0.056	0.273	0.04	0	0.041	0.589	0.046	0	0.035	0.566	0.118	0	0.068	0.783	0.086	0	0.016	0.938	0.078	0	0.004	0.759	0.051	0	0.022	0.772	0.154	0	0.024	0.164	0.254	0	0.198	0.947	0.117	0	0.026	0.611	0.28	0	0.262	0.66	0.05	0	0.055
60	1.278	0.04	0	0.047	0.76	0.082	0	0.089	0.722	0.054	0	0.056	0.271	0.04	0	0.041	0.585	0.046	0	0.035	0.563	0.118	0	0.068	0.775	0.086	0	0.016	0.927	0.078	0	0.004	0.751	0.051	0	0.022	0.769	0.154	0	0.024	0.16	0.254	0	0.196	0.934	0.117	0	0.026	0.61	0.28	0	0.262	0.647	0.05	0	0.054

TABLE B-17
MAXIMUM FACILITY CRITERIA POLLUTANT EMISSIONS
DRY FERMENTATION ANAEROBIC DIGESTION FACILITY PROJECT

Parameter[1]	UNITS	EMISSION RATE				
		NOx	POC	$PM_{10}/PM_{2.5}$	SOx (as SO_2)	CO
Maximum Hourly Emissions [1]						
Engines, with SCR (4) or	pounds per hour	0.70	1.60	0.13	1.44	8.37
Flares (3,1)		0.66	0.52	0.16	0.72	0.50
Biofilter 1 (1)		0.61	0.13	0.00064	0.00076	1.5
Biofilters 2 + 3 (2)		0.82	0.26	0.00060	0.00088	1.6
Diesel Emergency Generator Engine (3,1)		7.3	0.015	0.027	0.0077	0.19
Outdoor Curing Piles and Truck Idling (15)		0.23	0.15	0.0039	0.00013	0.10
Outdoor Loader and Other Truck Travel and Idling		0.73	0.12	0.073	0.0010	1.07
Outdoor Handling of Finished Product (3)		-	-	0.014	-	-
Total Project Maximum Hourly Emissions		**10.7**	**2.27**	**0.35**	**1.5**	**12.8**
Maximum Daily Emissions[1]						
Engines, with SCR (4) or	pounds per day	16.7	38.3	3.2	34.6	200.8
Flares (3,1)		15.84	12.42	3.92	17.32	12.02
Biofilter 1 (1)		5.324	2.707	0.0048	0.0063	12.03
Biofilters 2 + 3 (2)		7.447	5.312	0.0055	0.0075	12.97
Diesel Emergency Generator Engine (3,1)		7.289	0.015	0.027	0.0077	0.19
Outdoor Curing Piles and Truck Idling (15)		2.317	3.13	0.039	0.0013	1.03
Outdoor Loader and Other Truck Travel and Idling		10.07	1.66	1.29	0.015	20.44
Outdoor Handling of Finished Product (3)		-	-	0.11	-	-
Total Project Maximum Daily Emissions		56.7	51.1	7.0	34.7	247.4
Maximum Annual Emissions [1]						
Engines, with SCR (4) or	tons per year	3.0	6.9	0.57	6.2	36.1
Flares (3,3)		0.12	0.093	0.029	0.13	0.090
Biofilter 1 (1)		0.97	0.49	0.00088	0.0012	2.2
Biofilters 2 + 3 (2)		1.36	0.97	0.0010	0.0014	2.4
Diesel Emergency Generator Engine (3,3)		0.28	0.00058	0.0010	0.00030	0.0075
Outdoor Curing Piles and Truck Idling (15)		0.423	0.57	0.0071	0.00024	0.19
Outdoor Loader and Other Truck Travel and Idling		1.84	0.30	0.23	0.0027	3.7
Outdoor Handling of Finished Product (3)		-	-	0.020	-	-
Total Project Maximum Annual Emissions		**8.0**	**9.3**	**0.86**	**6.4**	**44.7**

1) The first number in parantheses after each source type gives the total number of emitting units in the facility, and the second is the number that operate during the same hour, day or year (i.e., each of the three Diesel Emergency Generator Engines is tested at a different time and each of the three flares backs up two CHP engines during different scheduled maintenance periods).

Table B-18
Operation Emissions and
BAAQMD CEQA Air Quality Significance Thresholds
Dry Fermentation Anaerobic Digestion Facility

Parameter	Units	Emission Rate													
		NOx	POC/ ROG	Combustion PM_{10}	Combustion $PM_{2.5}$	Fugitive PM_{10}	Fugitive $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	SO_2	CO	HAPs[a]	CO_2	CH_4	N_2O
1) Engine (single) Maximum Emissions (before BACT)	lbs/day	41.8	12.8	0.79	0.79	0	0	0.79	0.79	43.3 (b)	50.2	3.7	(p)	0.26	0.029
2) BAAQMD BACT Threshold[c]	lbs/day	10	10	10	None	None	None	NA	NA	10	10	(d)	None	None	None
3) BACT/T-BACT required for engines?	-	Yes	Yes	No	NA	NA	NA	NA	NA	Yes	Yes	(d)	NA	NA	NA
4) Engine (single) Maximum Emissions (after BACT)[e]	lbs/day	4.2	9.6	0.79	0.79	0	0	0.792	0.792	8.661	50.193	3.7	30,213	0.26	0.029
5) Flare (single) Maximum Emissions	lbs/day	15.8	12.4	3.9	3.9	0	0	3.920	3.920	17.322	12.021	4.3	(p)	0.52	0.058
6) BACT/T-BACT required for flares?	-	Yes	Yes	No	NA	NA	NA	NA	NA	Yes	Yes	(d)	NA	NA	NA
7A) Biofilter 1 (single) Maximum Emissions[f]	lbs/day	5.32	2.7	0.0048	0.0048	0	0	0.005	0.005	0.006	12.034	0.094 (g)	668	0.028	0.0055
7B) Biofilter 2 or 3 (single) Maximum Emissions[f]	lbs/day	3.72	2.7	0.0028	0.0028	0	0	0.003	0.003	0.004	6.487	0.094 (g)	397	0.016	0.0033
8) BACT/T-BACT required for biofilters?	-	No	No	No	NA	NA	NA	NA	NA	No	Yes	(d)	NA	NA	NA
9) Facility Curing, Product Stockpile and Product Haul Truck Idling (Diesel)	lbs/day	2.32	3.1	0.039	0.039	0.11	0.11 (h)	0.147	0.147	0.001	1.026	8.80	138.5	5.87E-03	1.17E-03
10) Facility Outdoor Loader Emissions (Diesel)[i]	lbs/day	4.80	0.77	1.0	1.0	0	0	0.960	0.960	0.008	16.640	0	811	0.033	0.007
11) Emergency Generator Engine (single 1,000 ekW Diesel-fueled)	lbs/day	7.29	0.015	0.027	0.027	0	0	0.027	0.027	0.008	0.192	0	805	0.033	0.0066
12) Trucks (Diesel) traveling with organic wastes	lbs/day	4.13	0.69	0.243	0.243	0.015	0.0037	0.258	0.246	0.006	2.938	0	579	3.02E-02	4.91E-03
13) Trucks (Diesel) traveling with finished product	lbs/day	1.14	0.19	0.067	0.067	0.004	0.0010	0.071	0.068	0.002	0.807	0	159	1.10E-02	1.35E-03
14) Employee and visitor vehicles	lbs/day	0.0037	2.41E-03	3.72E-04	3.72E-04	3.27E-04	8.06E-05	0.001	0.000	0.000	0.047	0	5.13	2.05E-04	4.11E-05
15) Truck (Diesel) delivery of other items for operation	lbs/day	0.003	5.66E-04	1.07E-04	1.07E-04	1.34E-04	3.30E-05	0.000	0.000	0.000	0.006	0	2.04E+00	2.17E-04	4.35E-05
16) Facility Maximum Potential Daily Emissions	lbs/day	56.653	51.1	4.5	4.5	0.13	0.11	7.0	7.0	34.7	247.4	23.7	124,415	1.2	0.15
16A) Facility Average Potential Daily Emissions	lbs/day	43.083	51.1	4.5	4.5	0.13	0.11	4.7	4.6	34.8	246.6				
17) BAAQMD CEQA Project (Facility) Daily Significance Threshold[j]	lbs/day	54.000	54	82	54	None	None	NA	NA	None	AAQS[k]	(d)	NA	NA	NA
18) Facility Daily Emissions Potentially Significant?	-	Yes	No	No	No	NA	NA	NA	NA	NA	No[l]	No[l]	NA	NA	NA
19) Facility Engine Maximum Emissions (after BACT)[e]	tpy	3.012	6.89	0.57	0.57	0	0	0.6	0.6	6.2	36.1	2.7	21753	0.19	0.021
20) BAAQMD Offset Threshold	tpy	35.000	35 (m)	None for non-Major Facility[n]	NA	None	None	NA	NA	None for non-Major Facility[n]	NA	NA	NA	NA	NA
21) Offsets Required?	--	No	No	No	No	NA	NA	NA	NA	No	NA	NA	NA	NA	NA
22) Facility Flare Maximum Emissions (BACT design)[o]	tpy	0.119	0.093	0.029	0.029	0	0	0.029	0.029	0.13	0.090	0.033	453	0.0039	0.00044
23) Facility Biofilters Maximum Emissions	tpy	2.331	1.464	0.0019	0.0019	0	0	0.00	0.00	0.0025	4.56	0.161	267	0.011	0.0022
24) Facility Curing, Product Stockpile and Product Haul Truck Idling (Diesel)	tpy	0.423	0.571	0.0071	0.0071	0.020	0.01971	0.03	0.03	0.0002 (S as SO2)	0.19	1.61	25.3	1.07E-03	2.14E-04
25) Facility Outdoor Loader Emissions[h]	tpy	0.876	0.140	0.175	0.18	0	0	0.18	0.18	0.0014	3.0	0	148	0.0061	1.21E-03
26) Facility Diesel-Fueled Emergency Generator Engines	tpy	0.284	0.00058	0.0010	1.04E-03	0	0	1.04E-03	1.04E-03	2.99E-04	0.0075	0	31.4	1.29E-03	2.58E-04
27) Trucks (Diesel) traveling with organic wastes	tpy	0.754	0.13	0.044	0.044	2.36E-03	5.82E-04	4.67E-02	4.49E-02	1.00E-03	0.54	0	105.7	4.48E-03	8.97E-04
28) Trucks (Diesel) traveling with finished product	tpy	0.207	0.035	0.01217	0.01217	6.49E-04	1.60E-04	1.28E-02	1.23E-02	2.76E-04	0.15	0	29.0	1.23E-03	2.46E-04
27) Employee and visitor vehicles	tpy	0.001	3.76E-04	5.81E-05	5.81E-05	5.10E-05	1.26E-05	1.09E-04	7.06E-05	7.97E-06	7.26E-03	0	0.80	3.20E-05	6.41E-06
29) Truck (Diesel) delivery of other items for operation	tpy	0.000	8.83E-05	1.68E-05	1.68E-05	2.09E-05	5.15E-06	3.76E-05	2.19E-05	3.16E-06	9.06E-04	0	0.32	3.39E-05	6.78E-06
30) Facility Annual Emissions (after BACT)	tpy	8.007	9.3	0.84	0.84	0.02	0.02	0.86	0.86	6.37	44.72	4.5	607	0.22	0.026
31) BAAQMD CEQA Project (Facility) Annual Significance Threshold[j]	tpy	10	10	15	10	None	None	NA	NA	None	None	(d)	10,000MTCO$_2$e		
32) Facility Annual Emissions Potentially Significant?	-	No	No	No	No	NA	NA	NA	NA	NA	NA	No[l]	No		

						4.56E-06 8.18E-06
						SF_6
Circuit breakers	tpy	-	-	-	1.13E-03	
On-road Mobile Sources	tpy	161	0.01	0.00	-	
Totals with biogenic emissions	tpy	22814	0.22	0.03	0.00	
Global Warming Potentia	-	1.00	21.00	310.00	23900.00	
Total GHG	MMTCO$_2$e/yr	0.021	0.0000041	0.0000074	0.0000244	0.021
	MTCO$_2$e/ yr	552.16	4.15	7.44	24.44	

[a] Hazardous air pollutants
[b] Based on H_2S in biogas at maximum expected concentration of 1,200 ppmv.
[c] The BACT thresholds, in BAAQMD Rule 2-2-301, are applicable to each emitting unit/source (as defined by Rule 2-2-234).
[d] BAAQMD Rule 2-5-301 requires application of Toxics-BACT (T-BACT) if cancer risk > 1 in one million or non-cancer chronic health hazard index > 0.20, which determination requires air dispersion modeling and health risk
[e] After application of BAAQMD BACT Guideline 96.5.2, Revision 2, May 14, 2009.
[f] Includes unreduced emissions from 2 loaders operating inside the main building.
[g] The only HAPs identified as emitted from the biofilters are ammonia and carbon disulfide, which is assumed to comprise one-third of the reduced sulfur compounds
[h] SJVAPCD (2007) did not provide $PM_{2.5}$ emission factors for material handling fugitive dust generation.
[i] Number of loaders outside = 3 and inside = 4
(i.e., three north side of Phase 1; another inside the main building of each phase; and the seventh inside the main building of the first phase)
[j] BAAQMD. "CEQA *Air Quality Guidance, June* 2010.
[k] In terms of 1-hour and 8-hour ambient air quality standards
[l] Assumes that engine, flare and biofilter designs and air dispersion modeling will demonstrate compliance with CO ambient air quality standards and health risk assessment limits.
[m] BAAQMD Rule 2-2-302.
[n] Facility is non-Major if pollutant annual emissions < 100 tpy (BAAQMD Rule 2-1-204.1
[o] BAAQMD BACT Guideline 80.1 (December 12, 1991) for a flare burning digester gas or landfill gas from a non-hazardous waste landfill
[p] Excluded from comparison with BAAQMD CEQA Thresholds of Significance by BAAQMD guidance (BAAQMD. "CEQA Air Quality Guidelines", page 4-5, June 2010.

Appendix C
Evaluation of Best Available Control Technology

Evaluation of Best Available Control Technology

As shown in Table C-1, BACT is required as follows:

- CHP Engines: NOx, POC, SO_2, CO, and PM_{10};
- Flares: NOx, POC, SO_2, and CO; and
- Biofilter 1: CO.

Table C-1
Best Available Control Technology Applicability Analysis

Pollutant	BACT Applicability Threshold (lbs/day)	Maximum Emission Level (lbs/day) - BACT Required?			
		Each CHP Engine	Each Flare	Biofilter 1/2 [b]	Emergency Standby Generator Engine
Criteria Pollutants: BAAQMD Regulation 2 Rule 2 New Source Review					
POC BACT Needed?	10	12.8 Yes	14.7 Yes	2.7/2.7 No/No	0.015 No
NOx BACT Needed?	10	41.8 Yes	15.8 Yes	5.3/3.7 No/No	7.3 No
SO_2 BACT Needed?	10	43.3 Yes	17.3 Yes	0.0063/ 0.0038 No/No	0.0077 No
PM_{10}[a] BACT Needed?	10	0.8 No	3.9 No	0.0048/ 0.0028 No/No	0.027 No
CO BACT Needed?	10	50.2 Yes	12.0 Yes	12/6.5 Yes/No	0.19 No

[a] Combustion only, not fugitive dust.
[b] Biofilters 2 and 3 do not require BACT because each has a maximum CO emission rate of 6.5 lbs/day, but all three biofilters will have identical design and construction that qualifies as BACT.

BACT for the applicable pollutants was determined by reviewing the BAAQMD BACT Guidelines,[76] SJVAPCD BACT Clearinghouse,[77] the South Coast Air Quality Management District (SCAQMD) BACT Guidelines,[78] CARB's BACT

[76] BAAQMD. "BACT Guidelines," http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.
[77] SJVAPCD. BACT Clearinghouse, http://www.valleyair.org/busind/pto/bact/bactchidx.htm.
[78] SCAQMD. "BACT Guidelines," http://www.aqmd.gov/bact/BACTGuidelines.htm.

Determinations,[79] and EPA's Reasonably Available Control Technology (RACT)/BACT/LAER Clearinghouse (RBLC).[80] This appendix summarizes that review.

NOx BACT – BACT for NOx emissions from the CHP engines will be the use of lean-burn combustion technology and add-on controls. The engines will emit 0.95 g/bhp-hr, which is less than the BAAQMD BACT Guideline 96.5.2 requirement of 1.25 g/bhp-hr for engines burning digester gas. In addition, the engines will be equipped with an SCR system to further reduce NOx emissions by 90% to 0.095 g/bhp-hr.

BACT for NOx emissions from the flares will be the use of a ground-level enclosed design complying with the requirements of BAAQMD BACT Guideline 80.1 for flares burning digester gas or landfill gas not generated by a hazardous waste landfill. The flares will emit NOx at 0.06 lbs/MMBtu, which complies with the BACT guideline limit of 0.06 lbs/MMBtu.

CO BACT – BACT for CO emissions from the CHP engines will be achieved by use of lean-burn technology in the MWM TCG2016 V12C model that emits 1.14 g/bhp-hr, which is less than the BAAQMD BACT Guideline 96.5.2 limit of 2.1 g/bhp-hr.

BACT for CO emissions from the flares will be achieved by use of a ground-level enclosed design complying with the requirements of BAAQMD BACT Guideline 80.1 for flares burning digester gas or landfill gas not generated by a hazardous waste landfill. The flares will have a retention time of at least 0.6 seconds and will operate at a temperature of at least 1,400 degrees Fahrenheit (ºF).

BACT for CO emissions from a biofilter is not specified in any BACT information source. The CO is not generated in any appreciable amount by the aerobic decomposition of the compost in the project main buildings, but is emitted by the two front-end loaders operating in Phase 1 and captured by the air flow to Biofilter 1. The loaders will be up-to-date models such as the Caterpillar 950H that has a C7 ATAAC engine using ACERT technology, resulting in the CO emission rate of 2.6 g/bhp-hr complying with the EPA Tier 3, Stage IIIA limit.

POC BACT – BACT for POC emissions from the CHP engines will be achieved by use of lean-burn combustion technology and add-on controls. The MWM TCG2016 V12C model emits 0.29 g/bhp-hr, which is less than the BAAQMD BACT Guideline 96.5.2 limit of 1.0 g/bhp-hr for lean-burn engines. Additional POC reduction will be achieved through use of an oxidation catalyst capable of at least 25% control, thereby reducing the engine POC emissions to 0.22 g/bhp-hr.

BACT for POC emissions from the flares will be achieved by use of a ground-level enclosed design complying with the requirements of BAAQMD BACT Guideline 80.1 for flares burning digester gas or landfill gas not generated by a hazardous waste landfill. The flares will have a retention time of at least 0.6 seconds and will operate at a temperature of at least 1,400 ºF.

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[79] CARB. Statewide BACT, http://www.arb.ca.gov/bact/bact.htm.
[80] EPA. RBLC, http://cfpub.epa.gov/rblc/htm/bl02.cfm.

PM_{10} BACT – For the CHP engines, BACT for PM_{10} is pre-treatment of the biogas to remove more than 80% of the H_2S, which will also reduce the SO_2 emissions. Iron-sponge or equivalent technology will be used to achieve at least the required 80% reduction.

SO_2 BACT – For the CHP engines, BACT for SO_2 is pre-treatment of the biogas to remove more than 80% of the H_2S, and a SO_2 emission rate no higher than 0.3 g/bhp-hr. The engines will emit 0.2 g/bhp-hr, which is less than the BAAQMD BACT Guideline 96.5.2 requirement of 0.3 g/bhp-hr for engines burning digester gas. Iron-sponge or equivalent technology will be used to achieve at least the required 80% reduction.

For the flares, BACT for SO_2 is pre-treatment of the biogas to comply with BAAQMD BACT Guideline 80.1 for flares burning digester gas or landfill gas not generated by a hazardous waste landfill. Iron-sponge or equivalent technology will be used to achieve at least the required 80% reduction.

Appendix D
Toxic Air Contaminant and Odor Emissions

Table D-1
Maximum Toxic Air Contaminant Emission Rates[1]
Dry Fermentation Anaerobic Digestion Facilitiy

Engine Toxic Air Contaminant	CAS Number	Molecular Weight[2] (lbs/lb-mole)	Concentration, ppmv: Biogas[3]	Concentration, ppmv: CHP Engine Exhaust[4]	Concentration, ppmv: Flare Exhaust[5]	Concentration, ppbv: Biofilters[0]	Max. Hourly and 8-Hour Emission Rate, lbs/hr: CHP Engine, one[6]	lbs/hr: Flare, one[7]	lbs/hr: Phase 1 Biofilter	lbs/hr: Phases 2 or 3 Biofilters	lbs/hr: Diesel Emergency Generator Engine, one	lbs/hr: Front-End Loader Engine, one	lbs/hr: All Emitting Units	Maximum Annual Emission Rate[0], tons/year: CHP Engine, one[8]	tons/year: Flare, one	tons/year: Phase 1 Biofilter	tons/year: Phases 2 or 3 Biofilters	tons/year: Diesel Emergency Generator Engine, one	tons/year: Front-End Loader Engine, one	lbs/yr: All Emitting Units	tons/year: CHP Engines, four[8]	tons/year: Flares, three	tons/year: Biofilters, three	BAAQMD Rule 2-5 TAC Trigger Levels: Acute (lb/hour)	BAAQMD Rule 2-5 TAC Trigger Levels: Chronic (lb/year)	BAAQMD Rule 2-5 Triggered? Project: Acute	BAAQMD Rule 2-5 Triggered? Project: Chronic	Odor Thresholds: ppmv	Odor Thresholds: µg/m3
Ammonia[2A]	7664417	17.031	0	10	0	20	2.31E-02	0	2.66E-03	2.66E-03			9.76E-02	0.10	0	1.16E-02	1.16E-02			**8.67E+02**	0.40	0	3.E-02	7.1	7,700	No	No	5	3,540
1,1,1-Trichloroethane (methyl chloroform	71556	133.4	2.07E-01	5.78E-03	4.75E-03		1.98E-04	2.34E-04					7.93E-04	8.68E-04	1.40E-05					7.03E+00	3.47E-03	4.21E-05		150	39,000	No	No		
1,1,2,2-Tetrachloroethane	79345	167.85	6.58E-01	1.84E-02	1.51E-02		7.95E-04	9.37E-04					**3.18E-03**	3.48E-03	5.62E-05					**2.82E+01**	1.39E-02	1.69E-04		-	**1.9**	No	Yes	7.3	50,000
1,1,2,3,4,4-Hexachloro-1,3-butadiene (Hexachlorobutad		260.76	2.61E-03	7.31E-05	6.01E-05		4.90E-06	5.77E-06					1.96E-05	2.15E-05	3.46E-07					1.74E-01	8.58E-05	1.04E-06		-	-	No	No		
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)		187.37	4.99E-02	1.40E-03	1.15E-03		6.73E-05	7.93E-05					2.69E-04	2.95E-04	4.76E-06					2.39E+00	1.18E-03	1.43E-05		-	-	No	No		
1,1,2-Trichloroethane	79005	133.4	1.76E-01	4.94E-03	4.06E-03		1.69E-04	2.00E-04					**6.77E-04**	7.42E-04	1.20E-05					**6.01E+00**	2.97E-03	3.59E-05		-	**6.6**	No	No		
1,1-Dichloroethane	75343	98.96	1.79E+00	5.02E-02	4.12E-02		1.28E-03	1.50E-03					**5.11E-03**	5.59E-03	9.03E-05					**4.53E+01**	2.24E-02	2.71E-04		-	66	No	No	41	165,000
1,1-Dichloroethene (1,1-Dichloroethylene)		96.94	1.40E-01	3.93E-03	3.23E-03		9.79E-05	1.15E-04					3.92E-04	4.29E-04	6.93E-06					3.47E+00	1.72E-03	2.08E-05		-	2,700	No	No		
1,2,3-Trimethylbenzene	25551137	120.19	8.97E-01	2.51E-02	2.06E-02		7.75E-04	9.14E-04					3.10E-03	3.39E-03	5.48E-05					2.75E+01	1.36E-02	1.64E-04		-	-	No	No		
1,2,4-Trichlorobenzene		181.45	5.29E-03	1.48E-04	1.22E-04		6.90E-06	8.13E-06					2.76E-05	3.02E-05	4.88E-07					2.45E-01	1.21E-04	1.46E-06		-	-	No	No		
1,2,4-Trimethylbenzene	95636	120.19	2.10E+00	5.87E-02	4.82E-02		1.81E-03	2.14E-03					7.25E-03	7.93E-03	1.28E-04					6.42E+01	3.17E-02	3.84E-04		-	-	No	No		
1,2-Dibromoethane (Ethylene dibromide)		187.86	4.21E-03	1.18E-04	9.69E-05		5.69E-06	6.71E-06					2.28E-05	2.49E-05	4.03E-07					2.02E-01	9.97E-05	1.21E-06		-	1.5	No	No		
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)		170.92	1.24E-01	3.47E-03	2.85E-03		1.52E-04	1.80E-04					6.10E-04	6.68E-04	1.08E-05					5.41E+00	2.67E-03	3.24E-05		-	-	No	No		
1,2-Dichloroethane (Ethylene dichloride)		98.96	2.30E-01	6.43E-03	5.28E-03		1.64E-04	1.93E-04					6.54E-04	7.16E-04	1.16E-05					5.80E+00	2.86E-03	3.47E-05		-	-	No	No		
1,2-Dichloroethene		96.94	1.11E+01	3.10E-01	2.54E-01		7.71E-03	9.09E-03					3.09E-02	3.38E-02	5.46E-04					2.74E+02	1.35E-01	1.64E-03		-	-	No	No		
1,2-Dichloropropane		112.99	3.86E-02	1.08E-03	8.87E-04		3.14E-05	3.70E-05					1.25E-04	1.37E-04	2.22E-06					1.11E+00	5.49E-04	6.65E-06		-	-	No	No	0.52	2.4
1,2-Diethylbenzene		134.22	6.74E-02	1.89E-03	1.55E-03		6.50E-05	7.67E-05					2.60E-04	2.85E-04	4.60E-06					2.31E+00	1.14E-03	1.38E-05		-	-	No	No		
1,3,5-Trimethylbenzene		120.19	8.52E-01	2.38E-02	1.96E-02		7.36E-04	8.68E-04					2.95E-03	3.22E-03	5.21E-05					2.61E+01	1.29E-02	1.56E-04		-	-	No	No		
1,3-Butadiene (Vinyl ethylene)		54.09	1.73E-01	4.85E-03	3.99E-03		6.74E-05	7.95E-05					**2.70E-04**	2.95E-04	4.77E-06					**2.39E+00**	1.18E-03	1.43E-05		-	0.63	No	Yes	1.1	2,400
1,3-Diethylbenzene		134.22	1.18E-01	3.30E-03	2.71E-03		1.14E-04	1.34E-04					4.55E-04	4.99E-04	8.05E-06					4.04E+00	1.99E-03	2.42E-05		-	-	No	No		
1,4-Dichlorobutane		127.01	3.84E-02	1.07E-03	8.82E-04		3.50E-05	4.13E-05					1.40E-04	1.53E-04	2.48E-06					1.24E+00	6.14E-04	7.44E-06		-	-	No	No		
1,4-Diethylbenzene		134.22	4.93E-01	1.38E-02	1.13E-02		4.76E-04	5.61E-04					1.90E-03	2.08E-03	3.37E-05					1.69E+01	8.34E-03	1.01E-04		-	-	No	No		
1,4-Dioxane (1,4-Diethylene dioxide)	123991	88.11	7.81E-03	2.19E-04	1.80E-04		4.95E-06	5.83E-06					1.98E-05	2.17E-05	3.50E-07					1.75E-01	8.67E-05	1.05E-06		-	-	No	No	75	270,000
1-Butene		56.11	6.05E-01	1.69E-02	1.39E-02		2.44E-04	2.88E-04					9.76E-04	1.07E-03	1.73E-05					8.66E+00	4.28E-03	5.18E-05		-	-	No	No		
2-Methylbutene		70.13	6.05E-01	1.69E-02	1.39E-02		3.05E-04	3.60E-04					1.22E-03	1.34E-03	2.16E-05					1.08E+01	5.34E-03	6.47E-05		-	-	No	No		
1-Butene / 2-Methylpropene		56.11	1.18E+00	3.30E-02	2.71E-02		4.75E-04	5.60E-04					1.90E-03	2.08E-03	3.36E-05					1.68E+01	8.32E-03	1.01E-04		-	-	No	No		
1-Ethyl-4-methylbenzene (4-Ethyl toluene)		120.19	9.04E-01	2.53E-02	2.08E-02		7.82E-04	9.21E-04					3.13E-03	3.42E-03	5.53E-05					2.77E+01	1.37E-02	1.66E-04		-	-	No	No		
1-Ethyl-4-methylbenzene (4-Ethyl toluene) + 1,3,5-Trim		120.19	5.84E-01	1.63E-02	1.34E-02		5.05E-04	5.95E-04					2.02E-03	2.21E-03	3.57E-05					1.79E+01	8.84E-03	1.07E-04		-	-	No	No		
1-Heptene		98.19	6.12E-01	1.71E-02	1.41E-02		4.33E-04	5.10E-04					1.73E-03	1.89E-03	3.06E-05					1.53E+01	7.58E-03	9.18E-05		-	-	No	No		
1-Hexene / 2-Methyl-1-pentene		84.16	8.78E-02	2.46E-03	2.02E-03		5.32E-05	6.27E-05					2.13E-04	2.33E-04	3.76E-06					1.89E+00	9.32E-04	1.13E-05		-	-	No	No		
1-Methylcyclohexene		96.17	3.42E-02	9.57E-04	7.86E-04		2.36E-05	2.79E-05					9.46E-05	1.04E-04	1.67E-06					8.38E-01	4.14E-04	5.02E-06		-	-	No	No		
1-Methylcyclopentene		82.14	2.87E-02	8.05E-04	6.61E-04		1.70E-05	2.00E-05					6.79E-05	7.44E-05	1.20E-06					6.02E-01	2.97E-04	3.60E-06		-	-	No	No		
1-Nonene		126.24	1.89E-01	5.30E-03	4.35E-03		1.72E-04	2.02E-04					6.87E-04	7.52E-04	1.21E-05					6.09E+00	3.01E-03	3.64E-05		-	-	No	No		
1-Octene		112.21	2.74E+00	7.68E-02	6.31E-02		2.21E-03	2.61E-03					8.86E-03	9.70E-03	1.57E-04					7.85E+01	3.88E-02	4.70E-04		-	-	No	No		
1-Pentene		70.13	2.09E-01	5.86E-03	4.81E-03		1.05E-04	1.24E-04					4.22E-04	4.62E-04	7.46E-06					3.74E+00	1.85E-03	2.24E-05		-	-	No	No		
1-Propanethiol (n-Propyl mercaptan)		76.16	1.16E-01	3.26E-03	2.68E-03		6.38E-05	7.52E-05					2.55E-04	2.79E-04	4.51E-06					2.26E+00	1.12E-03	1.35E-05		-	-	No	No		
2,2,3-Trimethylbutane		100.2	9.92E-03	2.78E-04	2.28E-04		7.15E-06	8.43E-06					2.86E-05	3.13E-05	5.06E-07					2.54E-01	1.25E-04	1.52E-06		-	-	No	No		
2,2,4-Trimethylpentane		114.23	4.54E-01	1.27E-02	1.05E-02		3.73E-04	4.40E-04					1.49E-03	1.64E-03	2.64E-05					1.32E+01	6.54E-03	7.92E-05		-	-	No	No		
2,2,5-Trimethylhexane		128.26	1.56E-01	4.36E-03	3.58E-03		1.44E-04	1.70E-04					5.75E-04	6.30E-04	1.02E-05					5.10E+00	2.52E-03	3.05E-05		-	-	No	No		
2,2-Dimethylbutane		86.18	1.41E-01	3.93E-03	3.23E-03		8.71E-05	1.03E-04					3.48E-04	3.82E-04	6.16E-06					3.09E+00	1.53E-03	1.85E-05		-	-	No	No		
2,2-Dimethylhexane		114.23	1.32E-01	3.70E-03	3.04E-03		1.08E-04	1.28E-04					4.34E-04	4.75E-04	7.67E-06					3.85E+00	1.90E-03	2.30E-05		-	-	No	No		
2,2-Dimethylpentane		100.2	6.89E-02	1.93E-03	1.59E-03		4.97E-05	5.86E-05					1.99E-04	2.18E-04	3.51E-06					1.76E+00	8.71E-04	1.05E-05		-	-	No	No		
2,2-Dimethylpropane		72.15	1.71E-02	4.78E-04	3.93E-04		8.87E-06	1.05E-05					3.55E-05	3.88E-05	6.27E-07					3.14E-01	1.55E-04	1.88E-06		-	-	No	No		
2,3,4-Trimethylpentane		114.23	2.40E-01	6.73E-03	5.53E-03		1.97E-04	2.33E-04					7.90E-04	8.65E-04	1.40E-05					7.00E+00	3.46E-03	4.19E-05		-	-	No	No		
2,3-Dimethylbutane		86.18	1.73E-01	4.84E-03	3.98E-03		1.07E-04	1.26E-04					4.29E-04	4.70E-04	7.58E-06					3.80E+00	1.88E-03	2.28E-05		-	-	No	No		
2,3-Dimethylpentane		100.2	2.37E-01	6.64E-03	5.45E-03		1.71E-04	2.01E-04					6.83E-04	7.48E-04	1.21E-05					6.06E+00	2.99E-03	3.62E-05		-	-	No	No		
2,4-Dimethylhexane		114.23	4.30E-01	1.20E-02	9.88E-03		3.53E-04	4.16E-04					1.41E-03	1.55E-03	2.50E-05					1.25E+01	6.18E-03	7.49E-05		-	-	No	No		
2,4-Dimethylpentane		100.2	1.24E-01	3.48E-03	2.86E-03		8.95E-05	1.06E-04					3.58E-04	3.92E-04	6.33E-06					3.17E+00	1.57E-03	1.90E-05		-	-	No	No		
2,5-Dimethylhexane		114.23	3.30E-01	9.25E-03	7.60E-03		2.71E-04	3.20E-04					1.09E-03	1.19E-03	1.92E-05					9.63E+00	4.76E-03	5.76E-05		-	-	No	No		
2,5-Dimethylthiophene		112.19	6.42E-02	1.80E-03	1.48E-03		5.18E-05	6.11E-05					2.07E-04	2.27E-04	3.66E-06					1.84E+00	9.08E-04	1.10E-05		-	-	No	No		
2-Butanone (Methyl ethyl ketone)		72.11	4.07E+00	1.14E-01	9.35E-02		2.11E-03	2.49E-03					8.43E-03	9.24E-03	1.49E-04					7.48E+01	3.69E-02	4.47E-04		29	-	No	No		
2-Ethyl-1-butene		84.16	3.45E-02	9.66E-04	7.93E-04		2.09E-05	2.46E-05					8.35E-05	9.14E-05	1.48E-06					7.40E-01	3.66E-04	4.43E-06		-	-	No	No		
2-Ethylthiophene		112.19	6.27E-02	1.76E-03	1.44E-03		5.06E-05	5.96E-05					2.02E-04	2.22E-04	3.58E-06					1.79E+00	8.86E-04	1.07E-05		-	-	No	No		
2-Ethyltoluene		120.19	6.31E-01	1.77E-02	1.45E-02		5.46E-04	6.43E-04					2.18E-03	2.39E-03	3.86E-05					1.94E+01	9.56E-03	1.16E-04		-	-	No	No		
2-Hexanone (Methyl butyl ketone)		100.16	4.99E-01	1.40E-02	1.15E-02		3.59E-04	4.24E-04					1.44E-03	1.57E-03	2.54E-05					1.27E+01	6.29E-03	7.62E-05		-	-	No	No		
2-Methyl-1-butene		70.13	1.96E-01	5.50E-03	4.52E-03		9.91E-05	1.17E-04					3.96E-04	4.34E-04	7.01E-06					3.51E+00	1.74E-03	2.10E-05		-	-	No	No		
2-Methyl-1-propanethiol (Isobutyl mercaptan)		90.19	1.70E-01	4.76E-03	3.91E-03		1.10E-04	1.30E-04					4.41E-04	4.83E-04	7.80E-06					3.91E+00	1.93E-03	2.34E-05		-	-	No	No		
2-Methyl-2-butene		70.13	2.71E-01	7.60E-03	6.24E-03		1.37E-04	1.61E-04					5.48E-04	6.00E-04	9.68E-06					4.85E+00	2.40E-03	2.90E-05		-	-	No	No		
2-Methyl-2-propanethiol (tert-Butylmercaptan)		90.19	3.24E-01	9.07E-03	7.45E-03	3.24E-01	2.10E-04	2.48E-04	2.28E-04	2.28E-04			1.30E-03	9.20E-04	1.49E-05	9.98E-04	9.98E-04			1.34E+01	3.68E-03	4.46E-05	3.E-03	-	-	No	No		
2-Methylbutane		72.15	1.13E+00	3.17E-02	2.60E-02		5.87E-04	6.92E-04					2.35E-03	2.57E-03	4.15E-05					2.08E+01	1.03E-02	1.25E-04		-	-	No	No		
2-Methylheptane		114.23	2.17E+00	6.09E-02	5.00E-02		1.79E-03	2.11E-03					7.15E-03	7.82E-03	1.26E-04					6.34E+01	3.13E-02	3.79E-04		-	-	No	No		
2-Methylhexane		100.2	8.39E-01	2.35E-02	1.93E-02		6.05E-04	7.13E-04					2.42E-03	2.65E-03	4.28E-05					2.14E+01	1.06E-02	1.28E-04		-	-	No	No		
2-Methylpentane		86.18	8.49E-01	2.38E-02	1.95E-02		5.26E-04	6.20E-04					2.10E-03	2.30E-03	3.72E-05					1.87E+01	9.22E-03	1.12E-04		-	-	No	No		
2-Propanol (Isopropyl alcohol)		60.1	1.92E+00	5.39E-02	4.42E-02		8.31E-04	9.80E-04					3.33E-03	3.64E-03	5.88E-05					2.95E+01	1.46E-02	1.76E-04		-	-	No	No		
3,6-Dimethyloctane		142.28	7.17E-01	2.01E-02	1.65E-02		7.34E-04	8.66E-04					2.94E-03	3.22E-03	5.19E-05					2.60E+01	1.29E-02	1.56E-04		-	-	No	No		
3-Ethyltoluene		120.19	1.35E+00	3.79E-02	3.12E-02		1.17E-03	1.38E-03					4.69E-03	5.13E-03	8.29E-05					4.15E+01	2.05E-02	2.49E-04		-	-	No	No		
3-Methyl-1-butene		70.14	6.30E-02	1.77E-03	1.45E-03		3.18E-05	3.75E-05					1.27E-04	1.39E-04	2.25E-06					1.13E+00	5.57E-04	6.75E-06		-	-	No	No		
3-Methyl-1-pentene		84.16	6.78E-03	1.90E-04	1.56E-04		4.10E-06	4.84E-06					1.64E-05	1.80E-05	2.90E-07					1.46E-01	7.19E-05	8.71E-07		-	-	No	No		
3-Methylheptane		114.23	2.50E+00	6.99E-02	5.74E-02		2.05E-03	2.42E-03					8.20E-03	8.98E-03	1.45E-04					7.27E+01	3.59E-02	4.35E-04		-	-	No	No		
3-Methylhexane		100.2	1.56E+00	4.38E-02	3.60E-02		1.13E-03	1.33E-03					4.51E-03	4.94E-03	7.97E-05					4.00E+01	1.97E-02	2.39E-04		-	-	No	No		
3-Methylpentane		86.18	9.34E-01	2.62E-02	2.15E-02		5.79E-04	6.83E-04					2.32E-03	2.54E-03	4.10E-05					2.05E+01	1.01E-02	1.23E-04		-	-	No	No		
3-Methylthiophene		98.17	9.23E-02	2.58E-03	2.12E-03		6.52E-05	7.68E-05					2.61E-04	2.85E-04	4.61E-06					2.31E+00	1.14E-03	1.38E-05		-	-	No	No		
4-Methyl-1-pentene		84.16	2.33E-02	6.52E-04	5.36E-04		1.41E-05	1.66E-05					5.64E-05	6.18E-05	9.98E-07					5.00E-01	2.47E-04	2.99E-06		-	-	No	No		
4-Methyl-2-pentanone (MIBK)		100.16	8.40E-01	2.35E-02	1.93E-02		6.05E-04	7.13E-04					2.42E-03	2.65E-03	4.28E-05					2.15E+01	1.06E-02	1.28E-04		-	-	No	No		
4-Methylheptane		114.23	8.03E-01	2.25E-02	1.85E-02		6.59E-04	7.78E-04					2.64E-03	2.89E-03	4.67E-05					2.34E+01	1.16E-02	1.40E-04		-	-	No	No		
Acetaldehyde	75070	44.05	8.29E-02	2.32E-03	1.91E-03		2.63E-05	3.10E-05					1.05E-04	1.15E-04	1.86E-06					9.32E-01	4.60E-04	5.57E-06		1.0	38	No	No	0.067	0.12
Acetone		58.08	6.82E+00	1.91E-01	1.57E-01		2.85E-03	3.36E-03					1.14E-02	1.25E-02	2.01E-04					1.01E+02	4.99E-02	6.04E-04		-	-	No	No		
Acetonitrile	75058	41.05	5.32E-01	1.49E-02	1.22E-02		1.57E-04	1.85E-04					6.28E-04	6.88E-04	1.11E-05					5.57E+00	2.75E-03	3.33E-05		-	-	No	No	1181	1,950,000
Benzene	71432	78.11	2.17E+00	6.07E-02	4.99E-02		1.22E-03	1.44E-03					**4.87E-03**	5.33E-03	8.62E-05					**4.32E+01**	2.13E-02	2.58E-04		**2.9**	**3.8**	No	Yes	34	108,000
Benzyl chloride	100447	126.58	1.76E-02	4.93E-04	4.05E-04		1.60E-05	1.89E-05					6.41E-05	7.02E-05	1.13E-06					5.68E-01	2.81E-04	3.40E-06		0.53	2.2	No	No	0.041	0.21
Bromodichloromethane		163.83	6.80E-02	1.91E-03	1.56E-03		8.02E-05	9.45E-05					3.21E-04	3.51E-04	5.67E-06					2.84E+00	1.40E-03	1.70E-05		-	-	No	No		
Bromomethane (Methyl bromide)	74839	94.94	1.80E-02	5.04E-04	4.14E-04		1.23E-05	1.45E-05					4.92E-05	5.39E-05	8.70E-07					4.36E-01	2.15E-04	2.61E-06		8.6	190	No	No		
Butane		58.12	4.26E+00	1.19E-01	9.79E-02		1.78E-03	2.10E-03					7.12E-03	7.79E-03	1.26E-04					6.31E+01	3.12E-02	3.78E-04		-	-	No	No		
Carbon disulfide	75150	76.14	1.40E-01	3.93E-03	3.23E-03	1.40E-01	7.68E-05	9.06E-05	8.33E-05	8.33E-05			4.74E-04	3.36E-04	5.43E-06	3.65E-04	3.65E-04			4.91E+00	1.35E-03	1.63E-05	1.E-03	-	-	No	No	0.21	0.65
Carbon tetrachloride	56235	153.82	7.62E-03	2.13E-04	1.75E-04		8.43E-06	9.94E-06					3.37E-05	3.69E-05	5.97E-07					2.99E-01	1.48E-04	1.79E-06		4.2	2.5	No	No	141	884,000
Carbon tetrafluoride (Freon 14)		88	1.49E-01	4.18E-03	3.44E-03		9.46E-05	1.11E-04					3.78E-04	4.14E-04	6.69E-06					3.35E+00	1.66E-03	2.01E-05		-	-	No	No		
Carbonyl sulfide (Carbon oxysulfide)	463581	60.08	1.21E-01	3.39E-03	2.78E-03	1.21E-01	5.23E-05	6.17E-05	5.67E-05	5.67E-05			3.23E-04	2.29E-04	3.70E-06	2.48E-04	2.48E-04			3.35E+00	9.17E-04	1.11E-05	7.E-04	-	-	No	No	0.1	0.25
Chlorobenzene	108907	112.56	5.52E-01	1.55E-02	1.27E-02		4.47E-04	5.27E-04					1.79E-03	1.96E-03	3.16E-05					1.58E+01	7.83E-03	9.48E-05		-	39,000	No	No	1.3	5,900
Chlorodifluoromethane (Freon 22)	75456	86.47	6.17E-01	1.73E-02	1.42E-02		3.84E-04	4.53E-04					1.54E-03	1.68E-03	2.72E-05					1.36E+01	6.73E-03	8.15E-05		-	-	No	No		
Chloroethane (Ethyl chloride)	75003	64.51	2.51E+00	7.03E-02	5.78E-02		1.17E-03	1.37E-03					4.66E-03	5.10E-03	8.24E-05					4.13E+01	2.04E-02	2.47E-04		-	1,200,000	No	No		
Chloromethane (Methyl chloride)	74873	50.49	2.17E-01	6.08E-03	5.00E-03		7.89E-05	9.30E-05					3.15E-04	3.45E-04	5.58E-06					2.80E+00	1.38E-03	1.67E-05		-	-	No	No		
cis-1,2-Dichloroethene		96.94	1.24E+00	3.47E-02	2.85E-02		8.64E-04	1.02E-03					3.45E-03	3.78E-03	6.11E-05					3.06E+01	1.51E-02	1.83E-04		-	-	No	No		
cis-1,2-Dimethylcyclohexane		112.21	3.23E-01	9.03E-03	7.42E-03		2.60E-04	3.07E-04					1.04E-03	1.14E-03	1.84E-05					9.23E+00	4.56E-03	5.52E-05		-	-	No	No		
cis-1,3-Dichloropropene		110.97	1.22E-02	3.41E-04	2.80E-04		9.72E-06	1.15E-05					3.89E-05	4.26E-05	6.88E-07					3.45E-01	1.70E-04	2.06E-06		-	-	No	No		
cis-1,3-Dichloropropene / trans-1,3-Dichloropropene		110.97	8.48E-03	2.38E-04	1.95E-04		6.77E-06	7.98E-06					2.71E-05	2.97E-05	4.79E-07					2.40E-01	1.19E-04	1.44E-06		-	-	No	No		
cis-1,3-Dimethylcyclohexane		112.21	1.89E+00	5.28E-02	4.34E-02		1.52E-03	1.79E-03					6.09E-03	6.67E-03	1.08E-04					5.40E+01	2.67E-02	3.23E-04		-	-	No	No		
cis-1,4-Dimethylcyclohexane / trans-1,3-Dimethylcycloh		112.21	9.67E-01	2.71E-02	2.22E-02		7.80E-04	9.20E-04					3.12E-03	3.42E-03	5.52E-05					2.77E+01	1.37E-02	1.66E-04		-	-	No	No		
cis-2-Butene		56.11	1.25E-01	3.51E-03	2.88E-03		5.06E-05	5.96E-05					2.02E-04	2.21E-04	3.58E-06					1.79E+00	8.86E-04	1.07E-05		-	-	No	No		
cis-2-Heptene		98.19	4.70E-02	1.32E-03	1.08E-03		3.32E-05	3.91E-05					1.33E-04	1.45E-04	2.35E-06					1.18E+00	5.81E-04	7.04E-06		-	-	No	No		
cis-2-Hexene		84.16	1.63E-02	4.56E-04	3.75E-04		9.87E-06	1.16E-05					3.95E-05	4.32E-05	6.98E-07					3.50E-01	1.73E-04	2.09E-06		-	-	No	No		
cis-2-Octene		112.21	1.50E-01	4.19E-03	3.44E-03		1.21E-04	1.42E-04					4.83E-04	5.29E-04	8.55E-06					4.28E+00	2.12E-03	2.56E-05		-	-	No	No		
cis-2-Pentene		70.13	3.69E-02	1.03E-03	8.49E-04		1.86E-05	2.20E-05					7.45E-05	8.16E-05	1.32E-06					6.61E-01	3.26E-04	3.95E-06		-	-	No	No		
cis-3-Heptene		98.19	1.41E-02	3.94E-04	3.23E-04		9.93E-06	1.17E-05					3.97E-05	4.35E-05	7.02E-07					3.52E-01	1.74E-04	2.11E-06		-	-	No	No		
cis-3-Methyl-2-pentene		84.16	2.96E-02	8.28E-04	6.81E-04		1.79E-05	2.11E-05					7.16E-05	7.84E-05	1.27E-06					6.35E-01	3.14E-04	3.80E-06		-	-	No	No		
cis-4-Methyl-2-pentene		84.16	3.92E-02	1.10E-03	9.01E-04		2.37E-05	2.80E-05					9.49E-05	1.04E-04	1.68E-06					8.41E-01	4.16E-04	5.03E-06		-	-	No	No		
CO		28.01015	2.09E+01	5.86E-01	4.81E-01		4.21E-03	4.97E-03					1.69E-02	1.85E-02	2.98E-04					1.49E+02	7.38E-02	8.94E-04		-	-	No	No		
Cyclohexane	110827	84.16	1.12E+00	3.14E-02	2.58E-02		6.79E-04	8.01E-04					2.72E-03	2.97E-03	4.80E-05					2.41E+01	1.19E-02	1.44E-04		-	-	No	No		
Cyclohexene		82.14	1.91E-02	5.36E-04	4.40E-04		1.13E-05	1.33E-05					4.52E-05	4.95E-05	8.00E-07					4.01E-01	1.98E-04	2.40E-06		-	-	No	No		
Cyclopentane		70.13	7.18E-02	2.01E-03	1.65E-03		3.62E-05	4.27E-05					1.45E-04	1.59E-04	2.56E-06					1.28E+00	6.35E-04	7.69E-06		-	-	No	No		
Cyclopentene		69.12	9.40E-03	2.63E-04	2.16E-04		4.67E-06	5.51E-06					1.87E-05	2.05E-05	3.31E-07					1.66E-01	8.19E-05	9.92E-07		-	-	No	No		
Decane		142.28	4.47E+00	1.25E-01	1.03E-01		4.58E-03	5.39E-03					1.83E-02	2.00E-02	3.24E-04					1.62E+02	8.02E-02	9.71E-04		-	-	No	No		
Dibromochloromethane		208.28	1.35E-02	3.77E-04	3.09E-04		2.02E-05	2.38E-05					8.06E-05	8.83E-05	1.43E-06					7.15E-01	3.53E-04	4.28E-06		-	-	No	No		
Dibromomethane (Methylene dibromide)		173.84	8.35E-04	2.34E-05	1.92E-05		1.04E-06	1.23E-06					4.18E-06	4.57E-06	7.38E-08					3.70E-02	1.83E-05	2.22E-07		-	-	No	No		
Dichlorobenzene		147	7.76E-01	2.17E-02	1.79E-02		8.21E-04	9.68E-04					**3.28E-03**	3.60E-03	5.81E-05					**2.91E+01**	1.44E-02	1.74E-04		-	**9.5**	No	Yes	0.121	0.73
Dichlorodifluoromethane (Freon 12)	75718	120.91	1.04E+00	2.90E-02	2.38E-02		9.01E-04	1.06E-03					3.61E-03	3.95E-03	6.38E-05					3.20E+01	1.58E-02	1.91E-04		-	-	No	No		
Dichlorofluoromethane (Freon 21)	75434	102.92	1.57E-02	4.38E-04	3.60E-04		1.16E-05	1.37E-05					4.63E-05	5.07E-05	8.20E-07					4.11E-01	2.03E-04	2.46E-06		-	-	No	No		
Dichloromethane (Methylene chloride)		84.93	5.15E+00	1.44E-01	1.19E-01		3.15E-03	3.71E-03					1.26E-02	1.38E-02	2.23E-04					1.12E+02	5.52E-02	6.68E-04		-	-	No	No		
Diethyl sulfide		90.19	8.60E-02	2.41E-03	1.98E-03	8.60E-02	5.58E-05	6.58E-05	6.05E-05	6.05E-05			3.44E-04	2.44E-04	3.95E-06	2.65E-04	2.65E-04			3.57E+00	9.77E-04	1.18E-05	8.E-04	-	-	No	No		
Dimethyl disulfide		94.2	1.29E-01	3.62E-03	2.97E-03	1.29E-01	8.75E-05	1.03E-04	9.49E-05	9.49E-05			5.40E-04	3.83E-04	6.19E-06	4.16E-04	4.16E-04			5.60E+00	1.53E-03	1.86E-05	1.E-03	-	-	No	No		
Dimethyl sulfide		62.14	5.55E+00	1.55E-01	1.28E-01	5.55E+00	2.48E-03	2.93E-03	2.69E-03	2.69E-03			1.53E-02	1.09E-02	1.76E-04	1.18E-02	1.18E-02			1.59E+02	4.35E-02	5.27E-04	4.E-02	-	-	No	No		
Dodecane (n-Dodecane)		170.33	2.58E-01	7.23E-03	5.94E-03		3.16E-04	3.73E-04					1.27E-03	1.39E-03	2.24E-05					1.12E+01	5.54E-03	6.71E-05		-	-	No	No		
Ethane		30.07	8.85E+00	2.48E-01	2.04E-01		1.91E-03	2.26E-03					7.66E-03	8.39E-03	1.35E-04					6.79E+01	3.35E-02	4.06E-04		-	-	No	No		
Ethanol		46.07	2.22E-01	6.23E-03	5.12E-03		7.37E-05	8.69E-05					2.95E-04	3.23E-04	5.21E-06					2.61E+00	1.29E-03	1.56E-05		-	-	No	No		
Ethyl acetate		88.11	1.81E+00	5.06E-02	4.16E-02		1.15E-03	1.35E-03					4.58E-03	5.02E-03	8.10E-05					4.06E+01	2.01E-02	2.43E-04		-	-	No	No		
Ethyl mercaptan (Ethanediol)		62.14	1.89E-01	5.28E-03	4.34E-03	1.89E-01	8.43E-05	9.93E-05	9.14E-05	9.14E-05			5.20E-04	3.69E-04	5.96E-06	4.00E-04	4.00E-04			5.39E+00	1.48E-03	1.79E-05	1.E-03	-	-	No	No		
Ethyl methyl sulfide		76.16	3.66E-02	1.02E-03	8.42E-04	3.66E-02	2.00E-05	2.36E-05	2.17E-05	2.17E-05			1.24E-04	8.78E-05	1.42E-06	9.52E-05	9.52E-05			1.28E+00	3.51E-04	4.25E-06	3.E-04	-	-	No	No		
Ethylbenzene	100414	106.17	7.60E+00	2.13E-01	1.75E-01		5.80E-03	6.84E-03					**2.32E-02**	2.54E-02	4.11E-04					**2.06E+02**	1.02E-01	1.23E-03		-	**43**	No	Yes	0.46	2.0
Formaldehyde	50000	30.03	1.23E-02	3.44E-04	2.83E-04		2.66E-06	3.13E-06					1.06E-05	1.16E-05	1.88E-07					9.42E-02	4.65E-05	5.63E-07		0.12	18	No	No	0.98	1,200
Heptane		100.2	2.00E+00	5.61E-02	4.61E-02		1.44E-03	1.70E-03					5.77E-03	6.32E-03	1.02E-04					5.12E+01	2.53E-02	3.06E-04		-	-	No	No		
Hexane		86.18	3.01E+00	8.43E-02	6.93E-02		1.87E-03	2.20E-03					7.47E-03	8.18E-03	1.32E-04					6.62E+01	3.27E-02	3.96E-04		-	270,000	No	No		
Hexylbenzene		162.27	6.18E-04	1.73E-05	1.42E-05		7.21E-07	8.50E-07					2.88E-06	3.16E-06	5.10E-08					2.56E-02	1.26E-05	1.53E-07		-	-	No	No	65	230,000
Hydrogen chloride	7647010	36.46	3.50E+00	9.80E-02	8.05E-02		9.18E-04	1.08E-03					3.67E-03	4.02E-03	6.49E-05					3.26E+01	1.61E-02	1.95E-04		4.6	350	No	No	10.08	15,000
Hydrogen sulfide	7783064	34.08	30.41489	0.851617	0.699542501	30.41489135	0.0074555	0.00879	0.008084	0.008084			0.0459891	0.0326551	0.0005274	0.0354061	0.0354061			476.8412	0.13062	0.0015821	0.1062182	**0.093**	**390**	No	Yes		
Indane (2,3-Dihydroindene)		34.08	1.31E-01	3.67E-03	3.01E-03		3.21E-05	3.79E-05					1.29E-04	1.41E-04	2.27E-06					1.14E+00	0.000563	6.82E-06		-	-	No	No		
Isobutane (2-Methylpropane)		58.12	6.20E+00	1.74E-01	1.43E-01		2.59E-03	3.06E-03					1.04E-02	1.14E-02	1.83E-04					9.20E+01	4.54E-02	5.50E-04		-	-	No	No		
Isobutylbenzene		134.22	7.03E-02	1.97E-03	1.62E-03		6.78E-05	8.00E-05					2.71E-04	2.97E-04	4.80E-06					2.41E+00	1.19E-03	1.44E-05		-	-	No	No		
Isoprene (2-Methyl-1,3-butadiene)		68.12	4.43E-02	1.24E-03	1.02E-03		2.17E-05	2.56E-05					8.68E-05	9.51E-05	1.54E-06					7.70E-01	3.80E-04	4.61E-06		-	-	No	No		
Isopropyl mercaptan		76.16	1.68E-01	4.70E-03	3.86E-03	1.68E-01	9.19E-05	1.08E-04	9.96E-05	9.96E-05			5.67E-04	4.03E-04	6.50E-06	4.36E-04	4.36E-04			5.88E+00	1.61E-03	1.95E-05	1.E-03	-	-	No	No		
Isopropylbenzene (Cumene)		120.19	7.90E-01	2.21E-02	1.82E-02		6.83E-04	8.05E-04					2.73E-03	2.99E-03	4.83E-05					2.42E+01	1.20E-02	1.45E-04		-	-	No	No		
Methanethiol (Methyl mercaptan)		48.11	1.34E+00	3.75E-02	3.08E-02	1.34E+00	4.63E-04	5.46E-04	5.02E-04	5.02E-04			2.86E-03	2.03E-03	3.28E-05	2.20E-03	2.20E-03			2.96E+01	8.12E-03	9.83E-05	7.E-03	-	-	No	No		
Methyl tert-butyl ether (MTBE)	1634044	88.15	1.06E-01	2.97E-03	2.44E-03		6.71E-05	7.92E-05					2.69E-04	2.94E-04	4.75E-06					2.38E+00	1.18E-03	1.42E-05		-	210	No	No		
Methylcyclohexane		98.19	2.84E+00	7.96E-02	6.54E-02		2.01E-03	2.37E-03					8.03E-03	8.79E-03	1.42E-04					7.12E+01	3.52E-02	4.26E-04		-	-	No	No		
Methylcyclopentane		84.16	9.34E-01	2.61E-02	2.15E-02		5.65E-04	6.67E-04					2.26E-03	2.48E-03	4.00E-05					2.00E+01	9.90E-03	1.20E-04		-	-	No	No		
Naphthalene	91203	128.17	1.77E-01	4.95E-03	4.06E-03		1.63E-04	1.92E-04					**6.51E-04**	7.13E-04	1.15E-05					**5.77E+00**	2.85E-03	3.46E-05		-	**3.2**	No	Yes		
n-Butylbenzene		134.22	1.29E-01	3.60E-03	2.96E-03		1.24E-04	1.46E-04					4.97E-04	5.44E-04	8.78E-06					4.40E+00	2.18E-03	2.64E-05		-	-	No	No		
Nonane		128.26	6.58E+00	1.84E-01	1.51E-01		6.07E-03	7.16E-03					2.43E-02	2.66E-02	4.30E-04					2.15E+02	1.06E-01	1.29E-03		-	-	No	No		
n-Propylbenzene (Propylbenzene)		120.19	6.06E-01	1.70E-02	1.39E-02		5.24E-04	6.18E-04					2.10E-03	2.30E-03	3.71E-05					1.86E+01	9.19E-03	1.11E-04		-	-	No	No		
Octane		114.23	4.69E+00	1.31E-01	1.08E-01		3.85E-03	4.54E-03					1.54E-02	1.69E-02	2.72E-04					1.37E+02	6.74E-02	8.17E-04		-	-	No	No		
p-Cymene (1-Methyl-4-Isopropylbenzene)		134.22	3.38E+00	9.47E-02	7.78E-02		3.27E-03	3.85E-03					1.31E-02	1.43E-02	2.31E-04					1.16E+02	5.72E-02	6.93E-04		-	-	No	No		
Pentane		72.15	3.21E+00	9.00E-02	7.39E-02		1.67E-03	1.97E-03					6.67E-03	7.30E-03	1.18E-04					5.91E+01	2.92E-02	3.54E-04		-	-	No	No		
Propane		44.1	1.21E+01	3.38E-01	2.78E-01		3.83E-03	4.52E-03					1.53E-02	1.68E-02	2.71E-04					1.36E+02	6.71E-02	8.13E-04		-	-	No	No		
Propene (propylene)	115071	42.08	2.88E+00	8.06E-02	6.62E-02		8.71E-04	1.03E-03					3.48E-03	3.82E-03	6.16E-05					3.09E+01	1.53E-02	1.85E-04		-	120,000	No	No		
Propyne		40.06	3.98E-02	1.11E-03	9.15E-04		1.15E-05	1.35E-05					4.58E-05	5.02E-05	8.11E-07					4.06E-01	2.01E-04	2.43E-06		-	-	No	No		
sec-Butylbenzene		134.22	1.20E-01	3.36E-03	2.76E-03		1.16E-04	1.36E-04					4.63E-04	5.07E-04	8.18E-06					4.10E+00	2.03E-03	2.46E-05		-	-	No	No		
Styrene (Vinylbenzene)	100425	104.15	3.21E-01	9.00E-03	7.39E-03		2.41E-04	2.84E-04					9.63E-04	1.05E-03	1.70E-05					8.54E+00	4.22E-03	5.11E-05		46	35,000	No	No		
tert-Butylbenzene		134.22	2.40E-02	6.73E-04	5.53E-04		2.32E-05	2.73E-05					9.28E-05	1.02E-04	1.64E-06					8.23E-01	4.06E-04	4.92E-06		-	-	No	No		
Tetrachloroethylene (Perchloroethylene)	127184	165.83	1.78E+00	4.99E-02	4.10E-02		2.13E-03	2.51E-03					**8.50E-03**	9.31E-03	1.50E-04					**7.54E+01**	3.72E-02	4.51E-04		**44**	**18**	No	Yes		
Tetrahydrofuran (Diethylene oxide)		72.11	9.51E-01	2.66E-02	2.19E-02		4.93E-04	5.82E-04					1.97E-03	2.16E-03	3.49E-05					1.75E+01	8.64E-03	1.05E-04		-	-	No	No		
Thiophene		84.14	3.48E-01	9.73E-03	7.99E-03	3.48E-01	2.10E-04	2.48E-04	2.28E-04	2.28E-04			1.30E-03	9.21E-04	1.49E-05	9.99E-04	9.99E-04			1.35E+01	3.68E-03	4.46E-05	3.E-03	-	-	No	No		
Toluene (Methyl benzene)	108883	92.14	3.02E+01	8.47E-01	6.95E-01		2.00E-02	2.36E-02					8.01E-02	8.78E-02	1.42E-03					7.11E+02	3.51E-01	4.25E-03		82	12,000	No	No	6.7	25,400
trans-1,2-Dichloroethene		96.94	3.67E-02	1.03E-03	8.44E-04		2.56E-05	3.02E-05					1.02E-04	1.12E-04	1.81E-06					9.08E-01	4.48E-04	5.43E-06		-	-	No	No		
trans-1,2-Dimethylcyclohexane		112.21	1.25E+00	3.50E-02	2.87E-02		1.01E-03	1.19E-03					4.03E-03	4.41E-03	7.13E-05					3.57E+01	1.77E-02	2.14E-04		-	-	No	No		
trans-1,3-Dichloropropene		110.97	9.88E-03	2.77E-04	2.27E-04		7.88E-06	9.29E-06					3.15E-05	3.45E-05	5.58E-07					2.80E-01	1.38E-04	1.67E-06		-	-	No	No		
trans-1,4-Dimethylcyclohexane		112.21	8.45E-01	2.37E-02	1.94E-02		6.82E-04	8.04E-04					2.73E-03	2.99E-03	4.82E-05					2.42E+01	1.20E-02	1.45E-04		-	-	No	No		
trans-2-Butene		56.11	1.25E-01	3.50E-03	2.88E-03		5.05E-05	5.95E-05					2.02E-04	2.21E-04	3.57E-06					1.79E+00	8.84E-04	1.07E-05		-	-	No	No		
trans-2-Heptene		98.19	9.82E-03	2.75E-04	2.26E-04		6.94E-06	8.18E-06					2.77E-05	3.04E-05	4.91E-07					2.46E-01	1.22E-04	1.47E-06		-	-	No	No		
trans-2-Hexene		84.16	2.20E-02	6.16E-04	5.06E-04		1.33E-05	1.57E-05					5.33E-05	5.84E-05	9.43E-07					4.73E-01	2.33E-04	2.83E-06		-	-	No	No		
trans-2-Octene		112.21	2.74E+00	7.67E-02	6.30E-02		2.21E-03	2.61E-03					8.84E-03	9.68E-03	1.56E-04					7.84E+01	3.87E-02	4.69E-04		-	-	No	No		
trans-2-Pentene		70.13	3.18E-02	8.90E-04	7.31E-04		1.60E-05	1.89E-05					6.41E-05	7.02E-05	1.13E-06					5.68E-01	2.81E-04	3.40E-06		-	-	No	No		
trans-3-Heptene		98.19	8.06E-02	2.26E-03	1.85E-03		5.70E-05	6.71E-05					2.28E-04	2.49E-04	4.03E-06					2.02E+00	9.98E-04	1.21E-05		-	-	No	No		
trans-3-Methyl-2-pentene		84.16	2.26E-02	6.32E-04	5.19E-04		1.37E-05	1.61E-05					5.47E-05	5.98E-05	9.66E-07					4.85E-01	2.39E-04	2.90E-06		-	-	No	No		
Tribromomethane (Bromoform)		252.73	1.29E-02	3.61E-04	2.97E-04		2.35E-05	2.77E-05					9.38E-05	1.03E-04	1.66E-06					8.32E-01	4.11E-04	4.98E-06		-	-	No	No		
Trichloroethylene (Trichloroethene)	79016	131.39	7.55E-01	2.11E-02	1.74E-02		7.13E-04	8.41E-04					2.85E-03	3.12E-03	5.04E-05					2.53E+01	1.25E-02	1.51E-04		-	54	No	No		
Trichlorofluoromethane (Freon 11)	75694	137.37	2.14E-01	5.98E-03	4.92E-03		2.11E-04	2.49E-04					8.45E-04	9.25E-04	1.49E-05					7.49E+00	3.70E-03	4.48E-05		-	-	No	No		
Trichloromethane (Chloroform)		119.38	6.67E-02	1.87E-03	1.53E-03		5.73E-05	6.75E-05					2.29E-04	2.51E-04	4.05E-06					2.03E+00	1.00E-03	1.22E-05		-	-	No	No		
Undecane		156.31	1.76E+00	4.92E-02	4.04E-02		1.98E-03	2.33E-03					7.90E-03	8.65E-03	1.40E-04					7.00E+01	3.46E-02	4.19E-04		-	-	No	No		
Vinyl acetate	108054	86.09	1.92E-01	5.38E-03	4.42E-03		1.19E-04	1.40E-04					4.76E-04	5.21E-04	8.42E-06					4.22E+00	2.08E-03	2.52E-05		-	-	No	No		
Vinyl chloride (Chloroethene)	75014	62.5	1.23E+00	3.46E-02	2.84E-02		5.55E-04	6.54E-04					**2.22E-03**	2.43E-03	3.92E-05					**1.97E+01**	9.72E-03	1.18E-04		**400**	**1.4**	No	Yes		
Xylenes (o-, m-, p-, mixtures)	1330207	106.17	1.06E+01	2.98E-01	2.45E-01		8.13E-03	9.58E-03					3.25E-02	3.56E-02	5.75E-04					2.88E+02	1.42E-01	1.72E-03		49	27,000	No	No		
TAC Subtotals:		-					1.54E-01	1.81E-01	1.22E-02	1.22E-02	0	0	6.39E-01	6.73E-01	1.09E-02	5.36E-02	5.36E-02	0	0	5.77E+03	2.69E+00	3.26E-02	1.61E-01	49	27,000	No	No		
NMOC (as hexane)		86.18	8.38E+02	2.35E+01	1.93E+01		5.19E-01	6.12E-01					2.08E+00	2.28E+00	3.67E-02					1.84E+04	9.10E+00	1.10E-01		-	-	No	No		
VOC (as hexane)		86.18	8.35E+02	2.34E+01	1.92E+01		5.18E-01	6.10E-01					2.07E+00	2.27E+00	3.66E-02					1.84E+04	9.07E+00	1.10E-01		-	-	No	No		
Dioxins/Furans[9]		-	-	-	4.20E-07 (lbs/MMdscf CH4)		-	4.39E-09					1.32E-08	-	2.63E-10					1.58E-06	-	7.90E-10		-	-	No	No		
Diesel exhaust particulate	9901	-	-	-	-	-	-	-	6.38E-04	3.00E-04	2.66E-02	7.14E-02	9.90E-02			2.79E-03	1.31E-03	1.04E-03	3.27E-02	2.13E+02			0.005	-	-	No	No		
Totals		-	-	-	-	-	1.77E-01	1.81E-01	2.78E-02	2.74E-02	2.66E-02	7.14E-02	0.86	7.74E-01	7.93E-01	1.22E-01	1.20E-01	1.04E-03	3.27E-02	3.62E+03	4.64	4.76	0.73	-	-	No	No		
																				1125.126						Count= 0	Count= 9	Count= 20	Count= 20

(1) Biogas from the Project's anaerobic digestion is assumed to be similar enough to landfill gas from a municipal solid waste landfill to use toxics data from the latter.
(2) USEPA. *Compilation of Air Pollutant Emission Factors, Volume 1 - Stationary Point and Area Sources,* Chapter 2 - Solid Waste Disposal, Draft Section 2.4 - Municipal Solid Waste Landfills, Table 2.4-1 - Default Concentrations for LFG Constituents for Landfills with Waste in Place on or After 1992, October 2008
(3) Ibid, Mean concentrations (ppmv) in Appendix C - Landfill Gas Constituents (Uncorrected Concentrations), October 2008, as recommended by Carol Allen (BAAQMD) in telephone conversation with Eric Walther at Sierra Research on May 3, 2010.
(4) Ibid, Table 2.4-3 - Control Efficiencies for LFG NMOC and VOC, gives IC engine control efficiency (%) = 97.2%
(5) Ibid, Table 2.4-3 - Control Efficiencies for LFG NMOC and VOC, gives flare control efficiency (%) = 97.7%
(6) Based on an engine exhaust flow (scfm) = 1,657
(7) Based on a flare exhaust flow (scfm) = 2,378
(8) Maximum possible operation (hours/year) = 8,760
9) USEPA AP-42, Table 2.4-4, Ch. 2.4, October 2008 draft.
10) Biofilter flow rate (scfm) = 50,300

Appendix E
Air Dispersion Modeling

Detailed Air Quality Modeling Methodology

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise from any of the emitting units. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Building downwash can occur when wind speeds are high and a building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee side (downwind) of the building or structure. In the Project, the Main Building in each phase is relatively close to the set of emitting units.

Fumigation conditions consist of a stable layer of air lying a short distance above the release point of a plume with unstable air below (i.e., an inversion). Fumigation occurs when the plume is emitted into the low-lying layer of stable air that then becomes unstable upon mixing breakup of the inversion, resulting in a rapid turbulent transport of pollutants towards the ground and high ground-level pollutant concentrations. The low mixing height allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions rarely last as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in summer.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma_y)^2}\right) * \left[\left\{e^{-1/2(z-H/\sigma_z)^2}\right\} + \left\{e^{-1/2(z+H/\sigma_z)^2}\right\}\right]$$

where

C	=	the concentration in the air of the pollutant in question
Q	=	the pollutant emission rate
σ_y σ_z	=	the horizontal and vertical dispersion coefficients, respectively, at downwind distance x
u	=	the wind speed at the height of the plume center
x,y,z	=	the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack
H	=	the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by EPA for regulatory use and are based on conservative assumptions (i.e., the models tend to over predict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The EPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. Discussed in separate sections below are the following:

- Refined air quality impact analysis;
- Specialized modeling; and
- Existing ambient pollutant concentrations (background air quality).

The modeling procedures used for each type of modeling analysis are described in more detail in the following sections. Two EPA guideline models were used for different meteorological conditions in the ambient air quality impact analysis: AERMOD[81] and SCREEN3.

The EPA-approved AERMOD model was used to evaluate impacts in simple, intermediate, and complex terrain. AERMOD is a Gaussian dispersion model capable of assessing impacts from a variety of source types in areas of simple, intermediate, and complex terrain. The model can account for settling and dry deposition of particulates; area, line, and volume source types; downwash effects; and gradual plume rise as a function of downwind distance. The model is capable of estimating concentrations for a wide range of averaging times (from one hour to one year), and was applied with three years of actual meteorological data recorded at the Hanford, CA monitoring station. AERMOD replaces the previous EPA-recommended model, Industrial Source Complex, Version 3 (ISCST3), which has been used for many years for air quality impact analyses in CEC AFCs. The analysis using the AERMOD model is discussed in more detail below.

The SCREEN3 model was used to evaluate potential air quality impacts under inversion breakup and fumigation conditions because these are special meteorological conditions. The SCREEN3 model uses a range of meteorological conditions that could occur under inversion breakup fumigation. Because the emissions from the Diesel-fueled emergency standby generator engine are so small compared to the biogas-fueled engine emissions, they are excluded from this single-source model used for the fumigation analysis. The fumigation analysis is discussed in more detail below.

[81] The acronym AERMOD was derived from American Meteorological Society/Environmental Protection Agency Regulatory Model.

Refined Modeling

The refined air quality impact analyses were performed using the AERMOD model. The refined modeling uses the stack parameters that cause the highest ambient impact for each combination of criteria pollutant and averaging period. [82]

Inputs required by AERMOD include the following:

- Model options,
- Meteorological data,
- Source data, and
- Receptor data.

Standard AERMOD control parameters were used, including stack tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. Stack-tip downwash, which adjusts the effective stack height downward following the methods of Briggs[83] for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, was selected following EPA guidance. The urban option was used by invoking the URBANOPT option.[84]

The required emission source data inputs to both models used in this analysis include source locations, source elevations, stack heights, stack diameters, stack exit temperatures and velocities, and emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used is the Universal Transverse Mercator (UTM) Projection. The stack height that can be used in the model is limited by federal Good Engineering Practice (GEP) stack height restrictions, discussed in more detail below. In addition, Building Profile Input Program – Plume Rise Model Enhancements (BPIP-PRIME, current version 04274) requires nearby structure dimensions to calculate the impacts of building downwash.

For the purposes of modeling, a stack height beyond what is required by Good Engineering Practices[85] (GEP) is not allowed (40 CFR Part 60 §51.164); however, this requirement does not place a limit on the actual constructed height of a stack. GEP, as used in modeling analyses, is the height necessary to assure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP modeling restriction assures that any required regulatory control measure is not

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[82] The combinations are derived from the ambient air quality standards (see Table 4-1).

[83] Briggs, G.A. 1972. "Discussion on Chimney Plumes in Neutral and Stable Surroundings." Atmos. Environ. 6:507-510.

[84] The rural vs. urban option in AERMOD is primarily designed to set the fraction of incident heat flux that is transferred into the atmosphere. This fraction becomes important in urban areas having an appreciable "urban heat island" effect due to a large presence of land covered by concrete, asphalt, and buildings.

[85] Calculated according to EPA, Federal Register, Volume 50, Number 130, July 18, 1985.

compromised by the effect of that portion of the stack that exceeds the GEP. The EPA guidance[86] for determining GEP stack height is as follows:

$$H_g = H + 1.5L$$

where

H_g	=	GEP stack height, measured from the ground level elevation at the base of the stack
H	=	height of nearby structure(s) measured from the ground level elevation at the base of the stack
L	=	lesser dimension, height or maximum projected width, of nearby structure(s)

In using this equation, the guidance document indicates that both the height and width of the structure are determined from the frontal area of the structure, projected onto a plane perpendicular to the direction of the wind.

For the two biogas-fueled engine stacks in each phase, the nearby (influencing) structures are the percolate tanks, which are 39.33 feet (11.99 m) high. For the flares, the nearby (influencing) structures are also the percolate tanks. For the emergency generator engine, the nearby (influencing) structures are the percolate tanks and the mixing hall, which are 39.33 feet (11.99 m) high and are 33.92 feet (10.34 m) high, respectively. The Building Profile Input Program (BPIP) gives H_g values of 28.62 to 31.79 meters for the six biogas-fueled engine stacks (two in each phase), H_g values of 29.50 to 29.76 meters for the three generator engine stacks, and H_g values of 28.94 to 32.42 meters for the three flares. All these heights are less than 65 meters, and therefore GEP stack height is 65 meters. The proposed stack heights of 32.8 feet for the biogas-fueled engine stacks, 20 feet for the flares, and 30 feet for the emergency generator engines will not exceed GEP stack height, so the full physical stack height can be used in the modeling analysis.

For regulatory applications, a building is considered sufficiently close to a stack to cause wake effects when the downwind distance between the stack and the nearest part of the building is less than or equal to five times the lesser of the height or the projected width of the building. Building dimensions for the buildings analyzed as downwash structures were obtained from plot plans. The building dimensions were analyzed using the BPIP to calculate 36 wind-direction-specific building heights and projected building widths for use in building wake calculations. The building dimensions used in the GEP analysis are shown in Appendix E, Table E-1, and Figure B-1.

AERMOD was used to estimate proposed project impacts in simple, intermediate, and complex terrain. The AERMOD model was used to calculate 1 hour, 3-hour, 8-hour, 24-hour, and annual average concentrations. The complete modeling input for each pollutant and averaging period is shown in Appendix Table E-2.

[86] U.S. EPA. "Guideline for Determination of Good Engineering Practice Stack Height," Revised 6/85.

Refined modeling was performed in two phases: coarse grid modeling and fine grid modeling. Preliminary modeling was performed with the coarse grid to locate the areas of maximum concentration. In areas where the coarse grid analyses indicated modeled maxima for each site plan would be located, 25-meter refined receptor grids were used.

The model receptor grids were derived from USGS National Elevation Data (NED) data using the GeoTIFF format at a horizontal resolution of 1 arc-second (approximately 30 meters). All coordinates were referenced to UTM North American Datum 1983 (NAD83), Zone 11. The AERMOD receptor elevations were interpolated among the NED nodes according to standard AERMAP procedure. For determining concentrations in elevated terrain, the AERMAP terrain preprocessor receptor-output (ROU) file option was chosen. These terrain data are included in the modeling CD included as part of this report.

Specialized Modeling Analyses

Fumigation Modeling: The SCREEN3 model was used to evaluate maximum ground-level concentrations for short-term averaging periods (24 hours or less). EPA guidance[87] was followed in evaluating fumigation impacts. Inversion breakup fumigation is generally a short-term phenomenon but was evaluated here as persisting for up to 24 hours. SCREEN3 was used to model one-hour unit impacts from the CHP engines under 2.5 m/s winds and F stability (for fumigation impacts) and under all meteorological conditions. For averaging periods longer than one hour, impacts were adjusted using standard EPA persistence factors (3 hours, 0.9; 8 hours, 0.7; 24 hours, 0.4).

Because SCREEN3 is a single source model, a single CHP engine is modeled, and the impacts are multiplied by four to account for the four project engines. SCREEN3 predicts that the fumigation impact from the flares, emergency standby generator engines, and biofilters would be zero because the distances to the maximum fumigation impacts from these other sources occur less than 2,000 meters from the facility.

Ozone Limiting: In accordance with EPA guidance, one-hour NO_2 impacts during proposed project operation were modeled using the Plume Volume Molar Ratio Method (PVMRM) adaptation of the Ozone Limiting Method.[88] AERMOD PVMRM was used to calculate the NO_2 concentration based on the PVMRM method, and hourly ozone data. Hourly ozone data collected at the San Jose-Jackson Street monitoring station during the years 2005-2009 were used in conjunction with PVMRM to calculate hourly NO_2 concentrations from hourly NOx concentrations. Missing hourly ozone data were substituted prior to use with day-appropriate values (e.g., from the previous day, or the next day, for the same hour). Any other missing hourly ozone data were substituted with

[87] U.S. EPA-454/R-92-019, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised," October 1987.

[88] Cole, Henry S. and John E. Summerhays. "The Application of Reactive Plume Models to the Estimation of Short-Term NO2 Concentration," presentation at the Annual Meeting of the Air Pollution Control Association, Houston, Texas, June 1978, and "A Review of Techniques Available for Estimating Short-Term NO2 Concentrations," Journal of the Air Pollution Control Association, Volume 29, Number 8, pages 812-817, August 1979.

40 ppb ozone (typical ozone tropospheric background level). The PVMRM involves an initial comparison of the estimated maximum NOx concentration and the ambient ozone concentration left in the plume after reaction of NO with ozone to determine which is the limiting factor with respect to NO_2 formation. If the remaining ozone concentration is greater than the maximum NOx concentration, total conversion is assumed. If the NOx concentration is greater than the remaining ozone concentration, the formation of NO_2 is limited by the remaining ambient ozone concentration. In this case, the NO_2 concentration is set equal to the ozone concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion. Annual NOx impacts were converted to NO_2 using the EPA-guidance Ambient Ratio Method and the nationwide default conversion ratio of 0.75 for the annual average NO_2/NOx ratio.

Appendix F
Health Risk Assessment

Table F-1
Operation Health Risk Assessment Results
Dry Fermentation Anaerobic Digestion Facility Project

Table F-1A Dry Fermentation PMI HRA impacts (All sources)		
	HRA value	Receptor no.
Derived OEHHA Cancer Risk Residence (PMI)	3.65E-05	13761
Derived Adjusted Cancer Risk Residence (PMI)	2.81E-05	13761
Cancer Risk Worker (PMI)	**5.54E-06**	13761
Chronic (PMI), for worker	**0.024**	13776
Acute (PMI), for worker	**0.29**	13328

Table F-1B Dry Fermentation Residence Cancer impacts (All sources)					
Residential receptor Cancer Impacts	Derived OEHHA	**Derived Adjusted**	**Chronic**	**Acute**	Receptor no.
West-Southwest of the project (see Figure 4)	8.74E-08	6.72E-08	1.26E-04	1.58E-02	13786
South-Southwest of the project (see Figure 5)	5.72E-08	4.41E-08	1.15E-04	9.88E-03	13787
South-Southeast of the project (see Figure 6)	2.43E-07	**1.88E-07**	**0.0007**	**0.01**	13788
East-Northeast of the project (see Figure 7)	8.23E-08	6.34E-08	1.79E-04	1.09E-02	13789
Including Cancer Risk Adjustment Factor of:	**1.7**	**3.20E-07**			

Table F-1C Dry Fermentation Cumulative PMI HRA impacts (All sources)		
	HRA value	Receptor no.
Derived OEHHA Cancer Risk Residence (PMI)	1.55E-05	25988
Derived Adjusted Cancer Risk Residence (PMI)	1.19E-05	25988
Cancer Risk Worker (PMI)	**2.35E-06**	25988
Chronic (PMI)	**9.39E-03**	25988
Acute (PMI)	7.32E-02	25990

Table F-1D Dry Fermentation Cumulative Residence Cancer impacts (All sources)					
Residential receptor Cancer Impacts	Derived OEHHA	**Derived Adjusted**	**Chronic**	Acute	Receptor no.
West of the project	2.09E-07	1.61E-07	1.94E-04	1.76E-02	26409
South West of the project	1.42E-07	1.09E-07	1.65E-04	1.11E-02	26410
South of the project	5.34E-07	**4.12E-07**	**9.99E-04**	1.29E-02	26411
East of the project	1.91E-07	1.47E-07	2.48E-04	1.21E-02	26412
Including Cancer Risk Adjustment Factor of:	**1.7**	**7.00E-07**			

This file: c:\HARP\projects\demo\PointEstimateRisk.txt

Created by HARP Version 1.4b Build 23.08.00
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 10/26/2010 3:05:22 PM

Derived (Adjusted)

EXCEPTION REPORT
(there have been no changes or exceptions)

INPUT FILES:
Source-Receptor file:
Averaging period adjustment factors file: not applicable
Emission rates file: none
Site parameters file: C:\HARP\PROJECTS\DEMO\DryFermentationAnaerobicDigestionFacility.sit

GLC DATA SOURCE:
concentrations loaded from file c:\HARP\STARTUP.CML
chemicals and/or concentrations have been edited by the user
User memo:
CHEMICALS ADDED/DELETED BY USER:
ADDED: Acetaldehyde
ADDED: Acetonitrile
ADDED: NH3
ADDED: Benzene
ADDED: As cmpd(inorg)
DELETED: As cmpd(inorg)
ADDED: Benzyl Chloride
ADDED: Methyl Bromide
ADDED: CS2
ADDED: CCl4
ADDED: CarbonylSulfide
ADDED: Chlorobenzn
ADDED: 1,1-DiClEthane
ADDED: DieselExhPM
ADDED: DieselExhTOG
ADDED: DieselExhTOG
DELETED: DieselExhTOG
ADDED: 1,4-Dioxane
ADDED: Ethyl Benzene
ADDED: Ethyl Chloride
ADDED: ClDiFluorMethan
ADDED: DiClDiFlmethane
ADDED: DiClFluorMethan
ADDED: TriClFluorMetha
ADDED: Formaldehyde
ADDED: TriClFluorMetha
ADDED: Furan
ADDED: GasolExhPM
ADDED: GasolExhTOG
ADDED: Cyclohexane
ADDED: HCl
ADDED: H2S
ADDED: Methyl Bromide
ADDED: Methyl Chloride
ADDED: 1,1,1-TCA
ADDED: Me t-ButylEther
ADDED: Naphthalene
ADDED: Perc
ADDED: Propylene
ADDED: Styrene

ADDED: Te[illegible]ClEthane
ADDED: T[illegible]e
ADDED: 1,[illegible]riClEthan
ADDED: TCE
ADDED: 1,2,4TriMeBenze
ADDED: TriMeBenzns
ADDED: Vinyl Acetate
ADDED: Vinyl Chloride
ADDED: Xylenes
ADDED: 1,2-DiClEthylen
ADDED: 1,2-DiClPropane
ADDED: 1,2-DiClPropane
DELETED: 1,2-DiClPropane

Screening mode is OFF

Exposure Duration: 70 year (adult resident)
Analysis Method: Derived (Adjusted) Method
Health Effect: Cancer

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.05

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL GROU LEVEL CONCENTRATIONS (micrograms/m^3) (*** indicates not a ipathway chemical)

ABBREV	CAS	GLC Avrg	GLC Max	GLC Water	GLC Pasture	GLC Fish
Acetaldehyde	75070	1.000E+00	1.000E+00	***	***	***
Acetonitrile	75058	1.000E+00	1.000E+00	***	***	***
NH3	7664417	1.000E+00	1.000E+00	***	***	***
Benzene	71432	1.000E+00	1.000E+00	***	***	***
Benzyl Chloride	100447	1.000E+00	1.000E+00	***	***	***
Methyl Bromide	74839	1.000E+00	1.000E+00	***	***	***
CS2	75150	1.000E+00	1.000E+00	***	***	***
CCl4	56235	1.000E+00	1.000E+00	***	***	***
CarbonylSulfide	463581	1.000E+00	1.000E+00	***	***	***
Chlorobenzn	108907	1.000E+00	1.000E+00	***	***	***
1,1-DiClEthane	75343	1.000E+00	1.000E+00	***	***	***
DieselExhPM	9901	1.000E+00	1.000E+00	***	***	***
DieselExhTOG	9902	1.000E+00	1.000E+00	***	***	***
1,4-Dioxane	123911	1.000E+00	1.000E+00	***	***	***
Ethyl Benzene	100414	1.000E+00	1.000E+00	***	***	***
Ethyl Chloride	75003	1.000E+00	1.000E+00	***	***	***
ClDiFluorMethan	75456	1.000E+00	1.000E+00	***	***	***
DiClDiFlmethane	75718	1.000E+00	1.000E+00	***	***	***
DiClFluorMethan	75434	1.000E+00	1.000E+00	***	***	***
TriClFluorMetha	75694	1.000E+00	1.000E+00	***	***	***
Formaldehyde	50000	1.000E+00	1.000E+00	***	***	***
TriClFluorMetha	75694	1.000E+00	1.000E+00	***	***	***
Furan	110009	1.000E+00	1.000E+00	***	***	***
GasolExhPM	9910	1.000E+00	1.000E+00	***	***	***
GasolExhTOG	9911	1.000E+00	1.000E+00	***	***	***
Cyclohexane	110827	1.000E+00	1.000E+00	***	***	***
HCl	7647010	1.000E+00	1.000E+00	***	***	***
H2S	7783064	1.000E+00	1.000E+00	***	***	***
Methyl Bromide	74839	1.000E+00	1.000E+00	***	***	***
Methyl Chloride	74873	1.000E+00	1.000E+00	***	***	***
1,1,1-TCA	71556	1.000E+00	1.000E+00	***	***	***
Me t-ButylEther	1634044	1.000E+00	1.000E+00	***	***	***
Naphthalene	91203	1.000E+00	1.000E+00	***	***	***
Perc	127184	1.000E+00	1.000E+00	***	***	***
Propylene	115071	1.000E+00	1.000E+00	***	***	***
Styrene	100425	1.000E+00	1.000E+00	***	***	***
TetraClEthane	79345	1.000E+00	1.000E+00	***	***	***
Toluene	108883	1.000E+00	1.000E+00	***	***	***
1,1,2TriClEthan	79005	1.000E+00	1.000E+00	***	***	***
TCE	79016	1.000E+00	1.000E+00	***	***	***
TriMeBenzns	25551137	1.000E+00	1.000E+00	***	***	***
1,2,4TriMeBenze	95636	1.000E+00	1.000E+00	***	***	***
Vinyl Acetate	108054	1.000E+00	1.000E+00	***	***	***
Vinyl Chloride	75014	1.000E+00	1.000E+00	***	***	***
Xylenes	1330207	1.000E+00	1.000E+00	***	***	***
1,2-DiClEthylen	540590	1.000E+00	1.000E+00	***	***	***
1,2-DiClPropane	78875	1.000E+00	1.000E+00	***	***	***

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	75058	Acetonitrile	Acetonitrile	0.000E+00
0003	7664417	NH3	Ammonia	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	100447	Benzyl Chloride	Benzyl chloride	0.000E+00
0006	74839	Methyl Bromide	Methyl bromide {Bromomethane}	0.000E+00
0007	75150	CS2	Carbon disulfide	0.000E+00
0008	56235	CCl4	Carbon tetrachloride	0.000E+00
0009	463581	CarbonylSulfide	Carbonyl sulfide	0.000E+00

0010	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0011	75343	1,1-DiClEthane	1,1-Dichloroethane	0.000E+00
0012	9901	DieselExhPM	Diesel engine exhaust, particulate matter (Diesel PM)	0.000E+00
0013	9902	DieselExhTOG	Diesel engine exhaust, total organic gas	0.000E+00
0014	123911	1,4-Dioxane	1,4-Dioxane	0.000E+00
0015	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0016	75003	Ethyl Chloride	Ethyl chloride {Chloroethane}	0.000E+00
0017	75456	ClDiFluorMethan	Chlorodifluoromethane {Freon 22}	0.000E+00
0018	75718	DiClDiFlmethane	Dichlorodifluoromethane {Freon 12}	0.000E+00
0019	75434	DiClFluorMethan	Dichlorofluoromethane {Freon 21}	0.000E+00
0020	75694	TriClFluorMetha	Trichlorofluoromethane {Freon 11}	0.000E+00
0021	50000	Formaldehyde	Formaldehyde	0.000E+00
0022	75694	TriClFluorMetha	Trichlorofluoromethane {Freon 11}	0.000E+00
0023	110009	Furan	Furan	0.000E+00
0024	9910	GasolExhPM	Gasoline engine exhaust, particulate matter	0.000E+00
0025	9911	GasolExhTOG	Gasoline engine exhaust, total organic gas	0.000E+00
0026	110827	Cyclohexane	Cyclohexane	0.000E+00
0027	7647010	HCl	Hydrochloric acid	0.000E+00
0028	7783064	H2S	Hydrogen sulfide	0.000E+00
0029	74839	Methyl Bromide	Methyl bromide {Bromomethane}	0.000E+00
0030	74873	Methyl Chloride	Methyl chloride {Chloromethane}	0.000E+00
0031	71556	1,1,1-TCA	Methyl chloroform {1,1,1-Trichloroethane}	0.000E+00
0032	1634044	Me t-ButylEther	Methyl tert-butyl ether	0.000E+00
0033	91203	Naphthalene	Naphthalene	0.000E+00
0034	127184	Perc	Perchloroethylene {Tetrachloroethene}	0.000E+00
0035	115071	Propylene	Propylene	0.000E+00
0036	100425	Styrene	Styrene	0.000E+00
0037	79345	TetraClEthane	1,1,2,2-Tetrachloroethane	0.000E+00
0038	108883	Toluene	Toluene	0.000E+00
0039	79005	1,1,2TriClEthan	1,1,2-Trichloroethane	0.000E+00
0040	79016	TCE	Trichloroethylene	0.000E+00
0041	25551137	TriMeBenzns	Trimethylbenzenes	0.000E+00
0042	95636	1,2,4TriMeBenze	1,2,4-Trimethylbenzene	0.000E+00
0043	108054	Vinyl Acetate	Vinyl acetate	0.000E+00
0044	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0045	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0046	540590	1,2-DiClEthylen	1,2-Dichloroethylene	0.000E+00
0047	78875	1,2-DiClPropane	1,2-Dichloropropane	0.000E+00

EMISSIONS DATA SOURCE:
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC= DEV= PRO= STK= NAME=
SOURCE MULTIPLIER=

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)

0006		-	-	-	-	-	-		-	-	-	-
0007		-	-	-	-	-	-		-	-	-	-
0008	A	-	-	-	-	-	-	-	-	-	-	-
0009	-	-	-	-	-	-	-	-	-	-	-	-
0010	-	-	-	-	-	-	-	-	-	-	-	-
0011	A	-	-	-	-	-	-	-	-	-	-	-
0012	A	-	-	-	-	-	-	-	-	-	-	-
0013	-	-	-	-	-	-	-	-	-	-	-	-
0014	A	-	-	-	-	-	-	-	-	-	-	-
0015	A	-	-	-	-	-	-	-	-	-	-	-
0016	-	-	-	-	-	-	-	-	-	-	-	-
0017	-	-	-	-	-	-	-	-	-	-	-	-
0018	-	-	-	-	-	-	-	-	-	-	-	-
0019	-	-	-	-	-	-	-	-	-	-	-	-
0020	-	-	-	-	-	-	-	-	-	-	-	-
0021	A	-	-	-	-	-	-	-	-	-	-	-
0022	-	-	-	-	-	-	-	-	-	-	-	-
0023	-	-	-	-	-	-	-	-	-	-	-	-
0024	-	-	-	-	-	-	-	-	-	-	-	-
0025	-	-	-	-	-	-	-	-	-	-	-	-
0026	-	-	-	-	-	-	-	-	-	-	-	-
0027	-	-	-	-	-	-	-	-	-	-	-	-
0028	-	-	-	-	-	-	-	-	-	-	-	-
0029	-	-	-	-	-	-	-	-	-	-	-	-
0030	-	-	-	-	-	-	-	-	-	-	-	-
0031	-	-	-	-	-	-	-	-	-	-	-	-
0032	A	-	-	-	-	-	-	-	-	-	-	-
0033	A	-	-	-	-	-	-	-	-	-	-	-
0034	A	-	-	-	-	-	-	-	-	-	-	-
0035	-	-	-	-	-	-	-	-	-	-	-	-
0036	-	-	-	-	-	-	-	-	-	-	-	-
0037	A	-	-	-	-	-	-	-	-	-	-	-
0038	-	-	-	-	-	-	-	-	-	-	-	-
0039	A	-	-	-	-	-	-	-	-	-	-	-
0040	A	-	-	-	-	-	-	-	-	-	-	-
0041	-	-	-	-	-	-	-	-	-	-	-	-
0042	-	-	-	-	-	-	-	-	-	-	-	-
0043	-	-	-	-	-	-	-	-	-	-	-	-
0044	A	-	-	-	-	-	-	-	-	-	-	-
0045	-	-	-	-	-	-	-	-	-	-	-	-
0046	-	-	-	-	-	-	-	-	-	-	-	-
0047	A	-	-	-	-	-	-	-	-	-	-	-

DERIVED DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0002	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0004	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0005	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0006	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0007	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0009	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0012	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0015	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0022	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0028	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0035	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0037	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0038	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0045	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	2.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

DERIVED CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	2.90E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E-06
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0004	2.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E-05
0005	4.92E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-05
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	4.34E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-05
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	1.65E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-06
0012	3.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-04
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	7.82E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-06
0015	2.52E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-06
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	6.08E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.08E-06
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	0.00E+	.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
0032	5.21E-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.21E-07
0033	3.48E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.48E-05
0034	6.08E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.08E-06
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0037	5.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.79E-05
0038	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	1.65E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-05
0040	2.03E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-06
0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	7.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-05
0045	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	1.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-05
SUM	6.75E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.75E-04

This file: c` `RP\projects\demo\PointEstimateRisk.txt

Created by HARP Version 1.4b Build 23.08.00
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 10/26/2010 3:14:13 PM

PointEstimate Worker

EXCEPTION REPORT
(there have been no changes or exceptions)

INPUT FILES:
Source-Receptor file:
Averaging period adjustment factors file: not applicable
Emission rates file: none
Site parameters file: C:\HARP\PROJECTS\DEMO\DryFermentationAnaerobicDigestionFacility.sit

GLC DATA SOURCE:
concentrations loaded from file c:\HARP\STARTUP.CML
chemicals and/or concentrations have been edited by the user
User memo:
CHEMICALS ADDED/DELETED BY USER:
ADDED: Acetaldehyde
ADDED: Acetonitrile
ADDED: NH3
ADDED: Benzene
ADDED: As cmpd(inorg)
DELETED: As cmpd(inorg)
ADDED: Benzyl Chloride
ADDED: Methyl Bromide
ADDED: CS2
ADDED: CCl4
ADDED: CarbonylSulfide
ADDED: Chlorobenzn
ADDED: 1,1-DiClEthane
ADDED: DieselExhPM
ADDED: DieselExhTOG
ADDED: DieselExhTOG
DELETED: DieselExhTOG
ADDED: 1,4-Dioxane
ADDED: Ethyl Benzene
ADDED: Ethyl Chloride
ADDED: ClDiFluorMethan
ADDED: DiClDiFlmethane
ADDED: DiClFluorMethan
ADDED: TriClFluorMetha
ADDED: Formaldehyde
ADDED: TriClFluorMetha
ADDED: Furan
ADDED: GasolExhPM
ADDED: GasolExhTOG
ADDED: Cyclohexane
ADDED: HCl
ADDED: H2S
ADDED: Methyl Bromide
ADDED: Methyl Chloride
ADDED: 1,1,1-TCA
ADDED: Me t-ButylEther
ADDED: Naphthalene
ADDED: Perc
ADDED: Propylene
ADDED: Styrene

ADDED: Te[illegible]aClEthane
ADDED: T[illegible]ne
ADDED: 1,[illegible],2TriClEthan
ADDED: TCE
ADDED: 1,2,4TriMeBenze
ADDED: TriMeBenzns
ADDED: Vinyl Acetate
ADDED: Vinyl Chloride
ADDED: Xylenes
ADDED: 1,2-DiClEthylen
ADDED: 1,2-DiClPropane
ADDED: 1,2-DiClPropane
DELETED: 1,2-DiClPropane

Screening mode is OFF

Exposure Duration: Standard work schedule (49 wks/yr, 5 days/wk, 8 hrs/day, 40 yrs)
Analysis Method: Point estimate
Health Effect: Cancer, Chronic and Acute

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.05

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL GRO LEVEL CONCENTRATIONS (micrograms/m^3) (*** indicates not a ipathway chemical)

ABBREV	CAS	GLC Avrg	GLC Max	GLC Water	GLC Pasture	GLC Fish
Acetaldehyde	75070	1.000E+00	1.000E+00	***	***	***
Acetonitrile	75058	1.000E+00	1.000E+00	***	***	***
NH3	7664417	1.000E+00	1.000E+00	***	***	***
Benzene	71432	1.000E+00	1.000E+00	***	***	***
Benzyl Chloride	100447	1.000E+00	1.000E+00	***	***	***
Methyl Bromide	74839	1.000E+00	1.000E+00	***	***	***
CS2	75150	1.000E+00	1.000E+00	***	***	***
CCl4	56235	1.000E+00	1.000E+00	***	***	***
CarbonylSulfide	463581	1.000E+00	1.000E+00	***	***	***
Chlorobenzn	108907	1.000E+00	1.000E+00	***	***	***
1,1-DiClEthane	75343	1.000E+00	1.000E+00	***	***	***
DieselExhPM	9901	1.000E+00	1.000E+00	***	***	***
DieselExhTOG	9902	1.000E+00	1.000E+00	***	***	***
1,4-Dioxane	123911	1.000E+00	1.000E+00	***	***	***
Ethyl Benzene	100414	1.000E+00	1.000E+00	***	***	***
Ethyl Chloride	75003	1.000E+00	1.000E+00	***	***	***
ClDiFluorMethan	75456	1.000E+00	1.000E+00	***	***	***
DiClDiFlmethane	75718	1.000E+00	1.000E+00	***	***	***
DiClFluorMethan	75434	1.000E+00	1.000E+00	***	***	***
TriClFluorMetha	75694	1.000E+00	1.000E+00	***	***	***
Formaldehyde	50000	1.000E+00	1.000E+00	***	***	***
TriClFluorMetha	75694	1.000E+00	1.000E+00	***	***	***
Furan	110009	1.000E+00	1.000E+00	***	***	***
GasolExhPM	9910	1.000E+00	1.000E+00	***	***	***
GasolExhTOG	9911	1.000E+00	1.000E+00	***	***	***
Cyclohexane	110827	1.000E+00	1.000E+00	***	***	***
HCl	7647010	1.000E+00	1.000E+00	***	***	***
H2S	7783064	1.000E+00	1.000E+00	***	***	***
Methyl Bromide	74839	1.000E+00	1.000E+00	***	***	***
Methyl Chloride	74873	1.000E+00	1.000E+00	***	***	***
1,1,1-TCA	71556	1.000E+00	1.000E+00	***	***	***
Me t-ButylEther	1634044	1.000E+00	1.000E+00	***	***	***
Naphthalene	91203	1.000E+00	1.000E+00	***	***	***
Perc	127184	1.000E+00	1.000E+00	***	***	***
Propylene	115071	1.000E+00	1.000E+00	***	***	***
Styrene	100425	1.000E+00	1.000E+00	***	***	***
TetraClEthane	79345	1.000E+00	1.000E+00	***	***	***
Toluene	108883	1.000E+00	1.000E+00	***	***	***
1,1,2TriClEthan	79005	1.000E+00	1.000E+00	***	***	***
TCE	79016	1.000E+00	1.000E+00	***	***	***
TriMeBenzns	25551137	1.000E+00	1.000E+00	***	***	***
1,2,4TriMeBenze	95636	1.000E+00	1.000E+00	***	***	***
Vinyl Acetate	108054	1.000E+00	1.000E+00	***	***	***
Vinyl Chloride	75014	1.000E+00	1.000E+00	***	***	***
Xylenes	1330207	1.000E+00	1.000E+00	***	***	***
1,2-DiClEthylen	540590	1.000E+00	1.000E+00	***	***	***
1,2-DiClPropane	78875	1.000E+00	1.000E+00	***	***	***

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	75058	Acetonitrile	Acetonitrile	0.000E+00
0003	7664417	NH3	Ammonia	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	100447	Benzyl Chloride	Benzyl chloride	0.000E+00
0006	74839	Methyl Bromide	Methyl bromide {Bromomethane}	0.000E+00
0007	75150	CS2	Carbon disulfide	0.000E+00
0008	56235	CCl4	Carbon tetrachloride	0.000E+00
0009	463581	CarbonylSulfide	Carbonyl sulfide	0.000E+00

0010	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0011	75343	1,1-DiClEthane	1,1-Dichloroethane	0.000E+00
0012	9901	DieselExhPM	Diesel engine exhaust, particulate matter (Diesel PM)	0.000E+00
0013	9902	DieselExhTOG	Diesel engine exhaust, total organic gas	0.000E+00
0014	123911	1,4-Dioxane	1,4-Dioxane	0.000E+00
0015	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0016	75003	Ethyl Chloride	Ethyl chloride {Chloroethane}	0.000E+00
0017	75456	ClDiFluorMethan	Chlorodifluoromethane {Freon 22}	0.000E+00
0018	75718	DiClDiFlmethane	Dichlorodifluoromethane {Freon 12}	0.000E+00
0019	75434	DiClFluorMethan	Dichlorofluoromethane {Freon 21}	0.000E+00
0020	75694	TriClFluorMetha	Trichlorofluoromethane {Freon 11}	0.000E+00
0021	50000	Formaldehyde	Formaldehyde	0.000E+00
0022	75694	TriClFluorMetha	Trichlorofluoromethane {Freon 11}	0.000E+00
0023	110009	Furan	Furan	0.000E+00
0024	9910	GasolExhPM	Gasoline engine exhaust, particulate matter	0.000E+00
0025	9911	GasolExhTOG	Gasoline engine exhaust, total organic gas	0.000E+00
0026	110827	Cyclohexane	Cyclohexane	0.000E+00
0027	7647010	HCl	Hydrochloric acid	0.000E+00
0028	7783064	H2S	Hydrogen sulfide	0.000E+00
0029	74839	Methyl Bromide	Methyl bromide {Bromomethane}	0.000E+00
0030	74873	Methyl Chloride	Methyl chloride {Chloromethane}	0.000E+00
0031	71556	1,1,1-TCA	Methyl chloroform {1,1,1-Trichloroethane}	0.000E+00
0032	1634044	Me t-ButylEther	Methyl tert-butyl ether	0.000E+00
0033	91203	Naphthalene	Naphthalene	0.000E+00
0034	127184	Perc	Perchloroethylene {Tetrachloroethene}	0.000E+00
0035	115071	Propylene	Propylene	0.000E+00
0036	100425	Styrene	Styrene	0.000E+00
0037	79345	TetraClEthane	1,1,2,2-Tetrachloroethane	0.000E+00
0038	108883	Toluene	Toluene	0.000E+00
0039	79005	1,1,2TriClEthan	1,1,2-Trichloroethane	0.000E+00
0040	79016	TCE	Trichloroethylene	0.000E+00
0041	25551137	TriMeBenzns	Trimethylbenzenes	0.000E+00
0042	95636	1,2,4TriMeBenze	1,2,4-Trimethylbenzene	0.000E+00
0043	108054	Vinyl Acetate	Vinyl acetate	0.000E+00
0044	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0045	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0046	540590	1,2-DiClEthylen	1,2-Dichloroethylene	0.000E+00
0047	78875	1,2-DiClPropane	1,2-Dichloropropane	0.000E+00

EMISSIONS DATA SOURCE:
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC= DEV= PRO= STK= NAME=
SOURCE MULTIPLIER=

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)

EMISSIONS FOR FACILITY FAC= DEV= PRO= STK= NAME=
SOURCE MULTIPLIER=

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)

EMISSIONS FOR FACILITY FAC= DEV= PRO= STK= NAME=
SOURCE MULTIPLIER=

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)

AVERAGE DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0002	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0004	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0005	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0006	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0007	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0009	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0012	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0015	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0022	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0028	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0035	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0037	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0038	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0045	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AVERAGE CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	5.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-07
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0004	5.72E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-06
0005	9.72E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.72E-06
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	8.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.57E-06
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	3.26E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-07
0012	6.29E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.29E-05
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	1.54E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-06
0015	4.97E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E-07
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0018	0.00E+0[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00F[illegible]
0019	0.00E+[illegible]	.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E-[illegible]	.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00[illegible]
0020	0.00E+0[illegible]	.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	1.20E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	1.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-07
0033	6.86E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.86E-06
0034	1.20E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0037	1.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-05
0038	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	3.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-06
0040	4.00E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-07
0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	1.54E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-05
0045	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	3.60E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-06
SUM	1.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-04

INHALATION CONCENTRATION (ug/m^3) AND AVERAGE DOSE BY PATHWAY (mg/(kg-d)) FOR CHRONIC CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0002	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0004	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0005	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0006	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0007	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0009	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0012	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0015	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0022	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0028	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0029	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0035	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0037	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0038	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0045	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AVERAGE CHRONIC HI

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX
0001	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.14E-03	0.00E+00	0.00E+00	7.14E-03
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.00E-03	0.00E+00	0.00E+00	5.00E-03
0004	0.00E+00	1.67E-02	0.00E+00	1.67E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-02	1.67E-02
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0006	0.00E+00	2.00E-01	0.00E+00	2.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01
0007	0.00E+00	1.25E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-03	0.00E+00	0.00E+00	0.00E+00	1.25E-03
0008	0.00E+00	2.50E-02	0.00E+00	2.50E-02	0.00E+00	0.00E+00	2.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E-02
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-03	0.00E+00	1.00E-03	1.00E-03	0.00E+00	0.00E+00	0.00E+00	1.00E-03
0011	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0012	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	0.00E+00	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04
0015	0.00E+00	0.00E+00	0.00E+00	5.00E-04	5.00E-04	0.00E+00	5.00E-04	0.00E+00	5.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.00E-04
0016	0.00E+00	0.00E+00	0.00E+00	3.33E-05	0.00E+00	0.00E+00	3.33E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-05
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-01	0.00E+00	0.00E+00	1.11E-01
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-01	0.00E+00	0.00E+00	1.11E-01
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00	1.00E-01
0029	0.00E+00	2.00E-01	0.00E+00	2.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01
0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-03
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-04	1.25E-04	0.00E+00	1.25E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-04
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-01	0.00E+00	0.00E+00	1.11E-01
0034	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-02	0.00E+00	2.86E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-02
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	0.00E+00	0.00E+00	3.33E-04
0036	0.00E+00	1.11E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-03
0037	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0038	0.00E+00	3.33E-03	0.00E+00	3.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-03	0.00E+00	0.00E+00	3.33E-03
0039	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	0.00E+00	1.67E-03	0.00E+00	0.00E+00	0.00E+00	1.67E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-03

0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.00E-03	0.00E+00	0.00E+00	5.00E-03	
0044	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0045	0.00E+00	1.43E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-03	0.00E+00	0.00E+00	1.43E-03	
0046	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SUM	3.33E-04	4.51E-01	0.00E+00	4.46E-01	5.00E-04	1.79E-03	5.56E-02	0.00E+00	3.05E-02	2.25E-03	1.06E+00	0.00E+00	1.67E-02	1.06E+00	

ACUTE HI

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX
0001	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.13E-03	0.00E+00	0.00E+00	2.13E-03
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-04	0.00E+00	0.00E+00	3.13E-04
0004	0.00E+00	0.00E+00	0.00E+00	7.69E-04	0.00E+00	0.00E+00	0.00E+00	7.69E-04	0.00E+00	7.69E-04	0.00E+00	0.00E+00	7.69E-04	7.69E-04
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E-03	0.00E+00	0.00E+00	4.17E-03
0006	0.00E+00	2.56E-04	0.00E+00	2.56E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-04	2.56E-04	0.00E+00	0.00E+00	2.56E-04
0007	0.00E+00	1.61E-04	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	1.61E-04
0008	0.00E+00	5.26E-04	0.00E+00	5.26E-04	0.00E+00	0.00E+00	5.26E-04	0.00E+00	0.00E+00	5.26E-04	0.00E+00	0.00E+00	0.00E+00	5.26E-04
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0012	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	0.00E+00	0.00E+00	3.33E-04
0015	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-02
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-04	0.00E+00	0.00E+00	4.76E-04
0028	0.00E+00	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.38E-02
0029	0.00E+00	2.56E-04	0.00E+00	2.56E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-04	2.56E-04	0.00E+00	0.00E+00	2.56E-04
0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0031	0.00E+00	1.47E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-05
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	0.00E+00	5.00E-05	0.00E+00	0.00E+00	0.00E+00	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.00E-05	0.00E+00	0.00E+00	5.00E-05
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-05	0.00E+00	0.00E+00	4.76E-05
0037	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0038	0.00E+00	2.70E-05	0.00E+00	2.70E-05	0.00E+00	2.70E-05	0.00E+00	0.00E+00	0.00E+00	2.70E-05	2.70E-05	0.00E+00	0.00E+00	2.70E-05
0039	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	0.00E+00	5.56E-06	0.00E+00	0.00E+00	0.00E+00	5.56E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-06	0.00E+00	0.00E+00	5.56E-06
0045	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.55E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.55E-05	0.00E+00	0.00E+00	4.55E-05
0046	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0047	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SUM	0.00E+00	2.51E-02	0.00E+00	2.00E-03	0.00E+00	2.58E-02	5.26E-04	7.69E-04	0.00E+00	2.00E-03	8.10E-03	0.00E+00	7.69E-04	2.58E-02

Appendix G
Construction Emissions and Impact Assessment

Table G-1
Assumptions for Construction Emission Analysis
Dry Fermentation Anaerobic Digestion Facility Project

No.	Assumption	Units	Value	Reference
Operation Assumptions				
19	Total mass of amendment material needed	tons/year	45,000	Zero Waste
20	Mass of amendment material hauled from Zanker Landfill	tons/year	22,500	Zero Waste
21	Density of amendment material as green waste	tons/cu.yd.	0.31	Westlake Farms Application to the SJVAPCD
22	Capacity of trucks hauling amendment material	cubic yards	39	Calculated from density (No.15) and truck capacity (No. 17). Seems large.
23	Capacity of trucks hauling amendment material	tons	12	Emily Hanson July 2, 2010 email
24	Number of haul trucks delivering amendment material per d	/day	13	Calculated
25	Mass of organic material to be hauled	tons/year	225,000	Zero Waste
26	Capacity of large volume transfer trucks hauling organic ma	tons	20	Simi Valley Landfill and Recycling Facility
27	Number of large volume transfer trucks hauling organic ma	per day	105	Hexagon Transportation Consultants, Inc.
28	Capacity of collection route trucks hauling organic material	tons	7.75	Simi Valley Landfill and Recycling Facility
29	Number of collection route trucks hauling organic material	per day	45	Hexagon Transportation Consultants, Inc.
30	Daily amount of compost raw materials processed	per day	865.4	Calculated
31	Volume of composting tunnels (per phase) occupied by com	cubic yards	2,560	July 14, 2010 email from DJP&A
32	VOC emission factor for co-compost piles venting through a biofilter during the active phase	lbVOC/hr/yd^3	1.93E-04	SJVAPCD. *Authority to Construct Application Review, Westlake Farms Co-Composting, p.23,* 2007, citing *Emissions Evaluation of ASP Composting of Anaerobically-Digested Biosolids at the Davenport Composting Facility,* December 2003 and corrected by Tom Card,
33	VOC emission factor for co-compost piles venting during curing through a biofilter	lbVOC/hr/yd^3	9.58E-05	Id.
34	NH_3 emission factor for co-compost piles venting through a biofilter during both active and curing phases	lbVOC/hr/yd^3	1.97E-04	Id.
35	Operating days per year	days	365	"Normal" year, consistent with 8,760 hours.
36	Total number of base-loaded CHP engines	-	4	Based on Emily Hanson's October 21, 2010 email to Eric Hebert at 2:44 PM. Six egnines installed that handle the equivalent of 4 base-loaded engines.
37	CHP engine stack height	feet AGL	45	Initial height increased 50% to reduce impacts.
38	Construction workers during soil filling	number	12	Equal to heavy-duty equipment operators plus three.
39	Number of workers during Phase 1 construction	number	45	Equal to heavy-duty equipment operators plus three.
40	One-way distance traveled by employees, contruction workers, and delivery trucks to entrance	miles	25	South Bay area has a large worker population from which to draw the needed employees and construction workers.
41	Wind blown dust area			Assumed to decrease 10% per month after month 3.
42	Daily hours front-end loader engines operate	hours/day	8	Zero Waste; spread over 10 hours facility open for incoming and outgoing trucks.
43	Daily hours facility is open for incoming and outgoing mate	hours/day	10	8 AM - 6 PM according to Zero Waste

Table G-2
Construction Equipment
Dry Fermentation Anaerobic Digestion Facility Project

Construction Equipment Schedule

Equipment Description	Utilization		Work week		Number of Pieces of Equipment by Month																								Total Equip-ment Months	Peak Number of Equipment
	%	hr/day	days	hrs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HP	10%	1.2	6	7.2	0	0	1																						1	1
Roller Compactor, 100 HP	20%	2.4	6	14	0	0										1													1	1
Backhoe, 150 HP	20%	2.4	6	14	0	0	1																						1	1
Forklift, CAT V200, 175 HP	10%	1.2	6	7.2	0	0	1	1	1	1	1	1	1	1	1	1													10	1
Bulldozer, Cat D8R, 305 HP	100%	12	6	68	1	1	1	1																					4	1
Motor Grader, 135 HP	20%	2.4	6	10	0	0	1									1													2	1
Crane, pile lifting, 25 ton, 160 HP	10%	1.2	6	7.2	0	0	1																						1	1
Excavator, 195 HP	30%	3.6	6	22	0	0	1																						1	1
Manlift, 60ft, 30 HP	10%	1.2	6	7.2	0	0					1	1																	2	1
Scrapers, Cat 637G, 500 HP	100%	12	6	68	2	2																							4	2
Water Truck, 225 HP	100%	12	6	68	1	1	1	1	1	1	1	1	1	1	1	1													12	1
Welding Unit, 70 HP	10%	1.2	6	7.2	0	0		1	1	1	1	1																	5	1
Dump truck, Cat 770, 511 HP	50%	6	6	32	0	0										1													1	1
Boom truck, 220 HP	25%	3	6	14	1	1	1	1	1	1	1	1	1	1	1	1													12	1
Tandem Dump Truck, 30 CY, 250 HP	100%	12	6	68	4	4																							8	4
Concrete pump truck, 350 HP	10%	1.2	6	7.2	0	0				1																			1	1
Total vehicles					9	9	9	5	4	5	5	5	3	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	65	-

Workday duration (hrs) = 12
Workdays per week = 6
Workhours per week = 68

Table G-3
Construction Equipment Fuel USe
Dry Fermentation Anaerobic Digestion Facility Project

Construction Equipment
Daily Fuel Use

On-site			Onsite Daily Fuel Use (gals/day)																								
Equipment	Hrs/Day Per Unit	Gals/Hr Per Unit	Month 1 (1)	Month 2 (1)	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Total	
Pile driving equipment, 255 HP	1.2	5.67	0.0	0.0	**6.8**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Roller Compactor, 100 HP	2.4	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Backhoe, 150 HP	2.4	3.10	0.0	0.0	**7.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Forklift, CAT V200, 175 HP	1.2	2.50	0.0	0.0	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Bulldozer, Cat D8R, 305 HP	12.0	**7.25**	**87.0**	**87.0**	**87.0**	**87.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Motor Grader, 135 HP	2.4	3.30	0.0	0.0	**7.9**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**7.9**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Crane, pile lifting, 25 ton, 160 HP	1.2	3.56	0.0	0.0	**4.3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Excavator, 195 HP	3.6	4.70	0.0	0.0	**16.9**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Manlift, 60ft, 30 HP	1.2	1.27	0.0	0.0	0.0	0.0	0.0	0.0	**1.5**	**1.5**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Scrapers, Cat 637G, 500 HP	12.0	**16.0**	**384.0**	**384.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Water Truck, 225 HP	12.0	**3.13**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	**37.6**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	450.7	
Welding Unit, 70 HP	1.2	1.27	0.0	0.0	0.0	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Dump truck, Cat 770, 511 HP	6.0	6.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**40.5**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.5	
Boom truck, 220 HP	3.0	**3.13**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.7	
Tandem Dump Truck, 30 CY, 250 HP	6	**6.75**	**162.0**	**162.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.0	
Concrete pump truck, 350 HP	1.2	3.13	0.0	0.0	0.0	0.0	0.0	**3.8**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	
Totals:	-	-	**680.0**	**680.0**	**180.3**	**138.5**	**51.5**	**55.2**	**53.0**	**53.0**	**50.0**	**50.0**	**50.0**	**104.4**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Monthly Total =			12,239	12,239	3,245	2,493	927	994	954	954	899	899	899	1,879	0	0	0	0	0	0	0	0	0	0	0	0	38,621	total
Annual Total =														38,621	26,382	14,142	10,897	8,405	7,478	6,484	5,530	4,576	3,677	2,778	1,879	0	38,621	peak

Off-site			Offsite Daily Fuel Use (gals/day)																								
Equipment	Hrs/Day Per Unit	Gals/Hr Per Unit	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Total	
Pile driving equipment, 255 HP	0.0	953.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Roller Compactor, 100 HP	0.0	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Backhoe, 150 HP	0.0	3.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Forklift, CAT V200, 175 HP	0.0	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Bulldozer, Cat D8R, 305 HP	0.0	7.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Motor Grader, 135 HP	0.0	3.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Crane, pile lifting, 25 ton, 160 HP	0.0	358.32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Excavator, 195 HP	0.0	4.70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cranes, 230 ton, 220 HP	0.0	518.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cranes, 400 ton, 255 HP	0.0	603.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cranes, 15 ton, 101 HP	0.0	833.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Manlift, 60ft, 30 HP	0.0	1.27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Scrapers, Cat 637G, 500 HP	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Water Truck, 225 HP	0.0	3.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Welding Unit, 70 HP	0.0	1.27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Dump truck, Cat 770, 511 HP	0.0	6.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Boom truck, 220 HP	0.0	3.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tandem Dump Truck, 30 CY, 250 HP	**6**	**6.75**	**162.0**	**162.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.0	
Concrete pump truck, 350 HP	2.0	3.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Totals:	-	-	**162.0**	**162.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Monthly Total =			2,916	2,916	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,832	total
Annual Total =														5,832	2,916	0	0	0	0	0	0	0	0	0	0	0	5,832	peak

1) First two months of Phase 1 construction dedicated to bringing in 100,000 cubic yards of soil fill. Remaining 10 months of first year dedicated to construction of new facility structures.

Table G-4
OFFROAD2007 Construction Equipment Emission Factors
Dry Fermentation Anaerobic Digestion Facility Project

Santa Clara County Diesel Off-Road Emission Rates, OFFROAD2007 Model, Average Age Distribution

				1	2	3	5	6	4	8	
		Hrs/Day	Gals/Hr	Criteria Exhaust Emissions (g/hr)					GHG Exhaust Emissions (g/hr)		
EQ_ID	**Equipment**	**Per Unit**	**Per Unit**	**ROG**	**CO**	**NOx**	**SO_2**	**DPM**	**CO_2**	**CH_4**	**N_2O[1,2,3]**
1	Bulldozer, Cat D8R, 305 HP	12	7.25	51.2	203.1	470.2	0.47	18.8	47,726	4.6	0.925
2	Scrapers, Cat 637G, 500 HP	12	16	70.3	282.7	647.6	0.64	25.9	64,741	6.3	1.268
3	Water Truck, 225 HP	12	3.13	20.9	55.4	199.6	0.25	7.0	22,510	1.9	0.378
4	Dump truck, Cat 770, 511 HP	12	6.75	49.3	145.7	451.2	0.57	16.5	56,193	4.4	0.889
5	Boom truck, 220 HP	12	3.13	22.2	58.7	211.3	0.27	7.4	23,834	2.0	0.400
6	Tandem Dump Truck, 30 CY, 250 HP	12	6.75	41.9	110.9	399.2	0.51	13.9	45,021	3.8	0.756

		Hrs/Day	Gals/Hr	Criteria Exhaust Emissions (g/gal)					GHG Exhaust Emissions (g/gal)		
EQ_ID	**Equipment**	**Per Unit**	Per Unit	**ROG**	**CO**	**NOx**	**SO_2**	DPM	**CO_2**	**CH_4**	**N_2O[1,2,3]**
1	Bulldozer, Cat D8R, 305 HP	12	7.25	7.07	28.02	64.85	0.065	2.59	10,140	0.64	0.128
2	Scrapers, Cat 637G, 500 HP	12	16	4.39	17.67	40.47	0.040	1.62	10,140	0.40	0.079
3	Water Truck, 225 HP	12	3.13	6.69	17.71	63.76	0.081	2.22	10,140	0.60	0.121
4	Dump truck, Cat 770, 511 HP	12	6.75	7.30	21.58	66.85	0.084	2.44	10,140	0.66	0.132
5	Boom truck, 220 HP	12	3.13	7.08	18.76	67.51	0.086	2.35	10,140	0.64	0.128
6	Tandem Dump Truck, 30 CY, 250 HP	12	6.75	6.21	16.43	59.13	0.075	2.06	10,140	0.56	0.112

1) CH_4 emission factor (kg/MMBtu) = 0.003 = in lbs/MMBtu 0.0066

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

2) N_20 emission factor (kg/MMBtu) = 0.0006 = in lbs/MMBtu 0.0013

Id.

3) N_2O emission factor not reported by OFFROAD2007. Emission factor proportioned from CH_4 emission factor by ARB emission factors for Diesel fuel i

				1	2	3	5	6	4	8	
		Hrs/Day	Gals/Hr	Criteria Exhaust Emissions (g/hr)					GHG Exhaust Emissions (g/hr)		
EQ_ID	Equipment	Per Unit	Per Unit	ROG	CO	NOx	SO_2	DPM	CO_2	CH_4	N_2O[1,2,3]
2	Pile driving equipment, 255 HP	1.2	5.67	18.0	70.3	189.3	0.39	6.616	39,503	1.62	0.32
1	Roller Compactor, 100 HP	2.4	2.5	29.2	107.1	181.4	0.18	15.839	15,276	2.63	0.53
3	Backhoe, 150 HP	2.4	3.1	28.4	138.3	214.1	0.26	12.942	23,198	2.56	0.51
10	Forklift, CAT V200, 175 HP	1.2	2.5	19.8	93.5	154.4	0.18	9.124	16,037	1.78	0.36
9	Motor Grader, 135 HP	2.4	3.3	34.2	153.6	264.5	0.29	15.490	25,778	3.09	0.62
6	Crane, pile lifting, 25 ton, 160 HP	1.2	3.56	44.8	189.4	342.1	0.35	20.051	31,330	4.04	0.81
4	Excavator, 195 HP	3.6	4.7	32.7	89.7	325.0	0.43	11.082	37,849	2.95	0.59
7	Cranes, 230 ton, 220 HP	0	4.89	45.7	127.8	449.2	0.49	16.700	43,736	4.12	0.82
8	Cranes, 400 ton, 255 HP	0	5.67	67.3	239.5	643.2	0.69	24.449	70,231	6.07	1.21
5	Cranes, 15 ton, 101 HP	0	2.24	40.9	143.7	241.6	0.23	22.262	19,555	3.69	0.74
12	Manlift, 60ft, 30 HP	1.2	1.27	42.7	117.3	123.6	0.16	11.040	12,559	3.86	0.77
13	Welding Unit, 70 HP	1.2	1.27	21.2	78.5	132.0	0.14	11.575	11,536	1.91	0.38
11	Concrete pump truck, 350 HP	1.2	3.13	49.6	232.2	452.0	0.40	18.744	39,610	4.48	0.90

		Hrs/Day	Gals/Hr	Criteria Exhaust Emissions (g/gal)					GHG Exhaust Emissions (g/gal)		
EQ_ID	**Equipment**	**Per Unit**	Per Unit	**ROG**	**CO**	**NOx**	**SO_2**	DPM	**CO_2**	**CH_4**	**N_2O[1,2,3]**
2	Pile driving equipment, 255 HP	1.2	5.67	3.17	12.40	33.38	0.07	1.17	10,140	0.29	0.0573
1	Roller Compactor, 100 HP	2.4	2.5	11.66	42.84	72.55	0.07	6.34	10,140	1.05	0.210
3	Backhoe, 150 HP	2.4	3.1	9.16	44.60	69.06	0.08	4.17	10,140	0.83	0.165
10	Forklift, CAT V200, 175 HP	1.2	2.5	7.91	37.40	61.78	0.07	3.65	10,140	0.71	0.143
9	Motor Grader, 135 HP	2.4	3.3	10.37	46.54	80.16	0.09	4.69	10,140	0.94	0.187
6	Crane, pile lifting, 25 ton, 160 HP	1.2	3.56	12.58	53.20	96.11	0.10	5.63	10,140	1.13	0.227
4	Excavator, 195 HP	3.6	4.7	6.96	19.10	69.15	0.09	2.36	10,140	0.63	0.126
7	Cranes, 230 ton, 220 HP	0	4.89	9.34	26.13	91.86	0.10	3.42	10,140	0.84	0.169
8	Cranes, 400 ton, 255 HP	0	5.67	11.87	42.23	113.43	0.12	4.31	10,140	1.07	0.214
5	Cranes, 15 ton, 101 HP	0	2.24	18.24	64.16	107.85	0.10	9.94	10,140	1.65	0.329
12	Manlift, 60ft, 30 HP	1.2	1.27	33.65	92.34	97.30	0.13	8.69	10,140	3.04	0.607
13	Welding Unit, 70 HP	1.2	1.27	16.70	61.78	103.97	0.11	9.11	10,140	1.51	0.301
11	Concrete pump truck, 350 HP	1.2	3.13	15.85	74.18	144.40	0.13	5.99	10,140	1.43	0.286
	Minima		1.3						10,140	0.29	0.057 Minima
	Maxima		16.0						10,140	3.04	0.607 Maxima
	4) CO_2 emission factor for combustion of Diesel fuel set to ARB (2008) default value (g/gal) =								10,140	0.42	0.083
	ARB. "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions", December 8, 2008.								ARB (2008	ARB (200	ARB (2008)

Table G-5
Construction Equipment Fuel-Based Emission Factors
Dry Fermentation Anaerobic Digestion Facility Project

Onsite Combustion Fuel-Based Emission Factors

Average Construction Equipment Fleet Adjusted factors lbs/1000 gallon (4,8)									
Equipment	Tier	NOx	CO	VOC	SOx	PM_{10}	CO_2	CH_4	N_2O
Pile driving equipment, 255 HP	3	73.6	27.3	7.00	0.15	2.57	22,355	0.63	0.13
Roller Compactor, 100 HP	2	159.9	94.4	25.71	0.16	13.97	22,355	2.32	0.46
Backhoe, 150 HP	3	152.3	98.3	20.20	0.19	9.20	22,355	1.82	0.36
Forklift, CAT V200, 175 HP	3	136.19	82.5	17.44	0.16	8.05	22,355	1.57	0.31
Bulldozer, Cat D8R, 305 HP	3	143.0	61.8	15.58	0.14	5.71	22,355	1.41	0.28
Motor Grader, 135 HP	3	176.7	102.6	22.87	0.19	10.35	22,355	2.06	0.41
Crane, pile lifting, 25 ton, 160 HP	3	211.9	117.3	27.73	0.22	12.42	22,355	2.50	0.50
Excavator, 195 HP	3	152.4	42.1	15.34	0.20	5.20	22,355	1.38	0.28
Manlift, 60ft, 30 HP	2	214.5	203.6	74.18	0.28	19.17	22,355	6.69	1.34
Scrapers, Cat 637G, 500 HP		89.2	38.9	9.68	0.088	3.57	22,355	0.87	0.17
Water Truck, 225 HP	na	140.6	39.1	14.75	0.178	4.90	22,355	1.33	0.27
Welding Unit, 70 HP	2	229.2	136.2	36.82	0.23	20.09	22,355	3.32	0.66
Dump truck, Cat 770, 511 HP	na	147.4	47.6	16.09	0.18	5.38	22,355	1.45	0.29
Boom truck, 220 HP	na	148.8	41.4	15.62	0.19	5.19	22,355	1.41	0.28
Tandem Dump Truck, 30 CY, 250 HP	na	130.4	36.2	13.68	0.17	4.55	22,355	1.23	0.25
Concrete pump truck, 350 HP	na	318.3	163.6	35.0	0.28	13.2	22,355	3.15	0.63

Notes: Onsite Combustion Emissions
(1) - Steady State Emission Factors from Table A2 of EPA April 2004 NR-009c Publication.
(2) - In use adjustment factors per Table A3 EPA April 2004 NR-009c Publication.
(3) - PM10 and SO2 adjustments due to Equation 5 and Equation 7 on pages 21 and 22, respectively, of EPA Report No. NR-009c
(4) - Calculation uses adjusted BSFC and assumed 7.1 lbs/gallon. The onroad emission factors are not adjusted.
(5) - Daily fuel use based on peak combustion month equipment schedule.
(6) - Annual fuel use based on average level during peak 12-month period.
(7) - Annual fuel use based on average level during entire construction period.
(8) - Bolded values from OFFROAD2007 for average construction equipment fleet models.

Table G-6
Construction Equipment Combustion Emissions
Dry
Fermentation Anaerobic Digestion Facility Project

Nonroad Emissions

	Daily NOx Emissions (lbs/day)																									Period	Period
Equipment Month:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**		**Maxima**	**Means**
Pile driving equipment, 255 HF	0.00	0.00	**0.50**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.96**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Backhoe, 150 HP	0.00	0.00	**1.13**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Forklift, CAT V200, 175 HP	0.00	0.00	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Bulldozer, Cat D8R, 305 HP	**12.44**	**12.44**	**12.44**	**12.44**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Motor Grader, 135 HP	0.00	0.00	**1.40**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.40**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Crane, pile lifting, 25 ton, 160 HF	0.00	0.00	**0.90**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Excavator, 195 HP	0.00	0.00	**2.58**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Cranes, 230 ton, 220 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Cranes, 400 ton, 255 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Cranes, 15 ton, 101 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Manlift, 60ft, 30 HP	0.00	0.00	0.00	0.00	0.00	0.00	**0.33**	**0.33**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Scrapers, Cat 637G, 500 HP	**34.26**	**34.26**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Water Truck, 225 HP	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Welding Unit, 70 HP	0.00	0.00	0.00	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**5.97**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Boom truck, 220 HP	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Tandem Dump Truck, 30 CY, 250 HP, onsite	**21.12**	**21.12**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	**1.20**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total =	**74.50**	**74.50**	**26.04**	**19.87**	**7.44**	**8.63**	**7.76**	**7.76**	**7.09**	**7.09**	**7.09**	**15.41**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.50	21.93
Monthly Emissions (lbs/month) =	1,875	1,875	655	500	187	217	195	195	178	178	178	388	0	0	0	0	0	0	0	0	0	0	0	0	1,875	552
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	6,623	4,748	2,874	2,218	1,718	1,531	1,314	1,118	923	745	566	388	0	6,623	6,623
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	3.31	2.37	1.44	1.11	0.86	0.77	0.66	0.56	0.46	0.37	0.28	0.19	0.00	3.31	3.31
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**21.12**	**21.12**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1063.03	3.52
	Daily CO Emissions (lbs/day)																									
Equipment Month:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**		
Pile driving equipment, 255 HF	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Backhoe, 150 HP	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Forklift, CAT V200, 175 HP	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Bulldozer, Cat D8R, 305 HP	**5.37**	**5.37**	5.37	5.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Motor Grader, 135 HP	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Crane, pile lifting, 25 ton, 160 HF	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Excavator, 195 HP	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 230 ton, 220 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 400 ton, 255 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 15 ton, 101 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Manlift, 60ft, 30 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scrapers, Cat 637G, 500 HP	**14.96**	**14.96**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Water Truck, 225 HP	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	**1.47**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Welding Unit, 70 HP	0.00	0.00	0.00	0.21	0.21	0.21	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Boom truck, 220 HP	**0.39**	**0.39**	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Tandem Dump Truck, 30 CY, 250 HP	**5.87**	**5.87**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total =	**28.05**	**28.05**	**10.42**	**7.68**	**2.31**	**2.92**	**2.62**	**2.62**	**2.10**	**2.10**	**2.10**	**5.41**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.05	8.03
Monthly Emissions (lbs/month) =	706	706	262	193	58	74	66	66	53	53	53	136	0	0	0	0	0	0	0	0	0	0	0	0	706	202
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	2,426	1,720	1,014	752	558	500	427	361	295	242	189	136	0	2,426	2426
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	1.21	0.86	0.51	0.38	0.28	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.00	1.21	1.21

Table G-6
Construction Equipment Combustion Emissions
Dry
Fermentation Anaerobic Digestion Facility Project

Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**5.87**	**5.87**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.32	0.98
	Daily POC/ROG/VOC Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0.00	0.00	0.048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Backhoe, 150 HP	0.00	0.00	0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Forklift, CAT V200, 175 HP	0.00	0.00	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Bulldozer, Cat D8R, 305 HP	**1.36**	**1.36**	1.36	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Motor Grader, 135 HP	0.00	0.00	0.181	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.181	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Crane, pile lifting, 25 ton, 160 HF	0.00	0.00	0.118	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Excavator, 195 HP	0.00	0.00	0.260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 230 ton, 220 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 400 ton, 255 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 15 ton, 101 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Manlift, 60ft, 30 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.1131	0.1131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scrapers, Cat 637G, 500 HP	**3.72**	**3.72**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Water Truck, 225 HP	**0.55**	**0.55**	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Welding Unit, 70 HP	0.00	0.00	0.00	0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Boom truck, 220 HP	**0.15**	**0.147**	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Tandem Dump Truck, 30 CY, 250 HP	**2.22**	**2.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	0.131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total =	**7.99**	**7.99**	**2.87**	**2.16**	**0.81**	**0.94**	**0.92**	**0.92**	**0.75**	**0.75**	**0.75**	**1.74**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99	2.38
Monthly Emissions (lbs/month) =	201	201	72	54	20.4	23.7	23.2	23.2	19.0	19.0	19.0	44	0	0	0	0	0	0	0	0	0	0	0	0	201	59.99
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	720	519	318	246	191	171	147	124	101	82	63	44	0	720	719.91
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	0.36	0.26	0.16	0.12	0.10	0.09	0.07	0.06	0.05	0.04	0.03	0.02	0.00	0.36	0.36
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**2.22**	**2.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	111.55	0.37
	Daily SOx Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0.000	0.000	0.0010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Roller Compactor, 100 HP	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00095	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Backhoe, 150 HP	0.000	0.000	0.0014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Forklift, CAT V200, 175 HP	0.000	0.000	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Bulldozer, Cat D8R, 305 HP	**0.012**	**0.012**	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Motor Grader, 135 HP	0.000	0.000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Crane, pile lifting, 25 ton, 160 HF	0.000	0.000	0.00093	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Excavator, 195 HP	0.000	0.000	0.0034	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 230 ton, 220 HP	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 400 ton, 255 HP	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 15 ton, 101 HP	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Manlift, 60ft, 30 HP	0.000	0.000	0.00000	0.00000	0.00000	0.00000	0.00043	0.00043	0.00000	0.00000	0.00000	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scrapers, Cat 637G, 500 HP	**0.034**	**0.034**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Water Truck, 225 HP	**0.0067**	**0.0067**	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Welding Unit, 70 HP	0.000	0.000	0.00000	0.00036	0.00036	0.00036	0.00036	0.00036	0.00000	0.00000	0.00000	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dump truck, Cat 770, 511 HP	0.000	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0075	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Boom truck, 220 HP	**0.0018**	**0.0018**	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Tandem Dump Truck, 30 CY, 250 HP	**0.027**	**0.027**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Concrete pump truck, 350 HP	0.000	0.000	0.0000	0.0000	0.0000	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total =	**0.081**	**0.081**	**0.030**	**0.022**	**0.009**	**0.010**	**0.010**	**0.010**	**0.009**	**0.009**	**0.009**	**0.019**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.025
Monthly Emissions (lbs/month) =	2.0	2.0	0.7	0.5	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.05	0.63
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	7.52	5.47	3.43	2.68	2.14	1.90	1.64	1.40	1.15	0.93	0.70	0.48	0.00	7.52	7.52
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0038	0.0038
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**0.027**	**0.027**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.00
	Daily $PM_{10}/PM_{2.5}$ Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0.000	0.000	0.0175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Roller Compactor, 100 HP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Backhoe, 150 HP	0.000	0.000	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Forklift, CAT V200, 175 HP	0.000	0.000	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Bulldozer, Cat D8R, 305 HP	**0.497**	**0.497**	0.497	0.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Motor Grader, 135 HP	0.00	0.00	0.082	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Crane, pile lifting, 25 ton, 160 HF	0.00	0.00	0.053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Excavator, 195 HP	0.00	0.00	0.0880	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 230 ton, 220 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 400 ton, 255 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 15 ton, 101 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Manlift, 60ft, 30 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scrapers, Cat 637G, 500 HP	**1.37**	**1.37**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Water Truck, 225 HP	**0.18**	**0.18**	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Welding Unit, 70 HP	0.00	0.00	0.00	0.0306	0.0306	0.0306	0.0306	0.0306	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Boom truck, 220 HP	**0.049**	**0.049**	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Tandem Dump Truck, 30 CY, 250 HP	**0.737**	**0.737**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total =	**2.837**	**2.837**	**1.063**	**0.785**	**0.288**	**0.337**	**0.317**	**0.317**	**0.257**	**0.257**	**0.257**	**0.64**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.84	0.85
Monthly Emissions (lbs/month) =	71.4	71.4	26.7	19.7	7.2	8.5	8.0	8.0	6.5	6.5	6.5	16.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.4	21.38
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	257	185	114	86.9	67.2	60.0	51.5	43.5	35.5	29.1	22.6	16.1	0.0	256.5	256.5
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	0.13	0.09	0.06	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.128	0.128
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**0.737**	**0.737**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.07	0.12

Table G-6
Construction Equipment Combustion Emissions
Dry
Fermentation Anaerobic Digestion Facility Project

	Daily CO_2 Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0	0	152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Roller Compactor, 100 HP	0	0	0	0	0	0	0	0	0	0	0	134	0	0	0	0	0	0	0	0	0	0	0	0		
Backhoe, 150 HP	0	0	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Forklift, CAT V200, 175 HP	0	0	67	67	67	67	67	67	67	67	67	67	0	0	0	0	0	0	0	0	0	0	0	0		
Bulldozer, Cat D8R, 305 HP	**1945**	**1945**	**1945**	**1945**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Motor Grader, 135 HP	0	0	177	0	0	0	0	0	0	0	0	177	0	0	0	0	0	0	0	0	0	0	0	0		
Crane, pile lifting, 25 ton, 160 HF	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Excavator, 195 HP	0	0	378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cranes, 230 ton, 220 HP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cranes, 400 ton, 255 HP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cranes, 15 ton, 101 HP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Manlift, 60ft, 30 HP	0	0	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Scrapers, Cat 637G, 500 HP	**8584**	**8584**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Water Truck, 225 HP	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**840**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Welding Unit, 70 HP	0.0	0.0	0.0	34.1	34.1	34.1	34.1	34.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Dump truck, Cat 770, 511 HP	0	0	0	0	0	0	0	0	0	0	0	905	0	0	0	0	0	0	0	0	0	0	0	0		
Boom truck, 220 HP	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**210**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Tandem Dump Truck, 30 CY, 250 HP, onsite	**3622**	**3622**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Concrete pump truck, 350 HP	0	0	0	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total =	**15,200**	**15,200**	**4,031**	**3,096**	**1,151**	**1,235**	**1,185**	**1,185**	**1,117**	**1,117**	**1,117**	**2,333**	0	0	0	0	0	0	0	0	0	0	0	0	15,200	3,997
Monthly Emissions (lbs/month) =	382,540	382,540	101,436	77,906	28,959	31,072	29,817	29,817	28,102	28,102	28,102	58,719	0	0	0	0	0	0	0	0	0	0	0	0	382,540	100,593
Annual Emissions (lbs/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	1,207,112	824,572	442,031	340,595	262,689	233,730	202,658	172,841	143,024	114,922	86,821	58,719	0	1,207,112	1,207,112
Annual Emissions (tons/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	603.56	412.29	221.02	170.30	131.34	116.87	101.33	86.42	71.51	57.46	43.41	29.36	0.00	604	603.56
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**3622**	**3622**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	182,283	603.58

	Daily CH_4 Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0.00	0.00	**0.0043**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Backhoe, 150 HP	0.00	0.00	**0.0136**	**0.0000**	**0.0000**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Forklift, CAT V200, 175 HP	0.0000	0.0000	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Bulldozer, Cat D8R, 305 HP	**0.122**	**0.122**	**0.122**	**0.122**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**		
Motor Grader, 135 HP	0.0000	0.0000	0.0163	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0163	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Crane, pile lifting, 25 ton, 160 HF	0.0000	0.0000	0.0107	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Excavator, 195 HP	0.00	0.00	0.0234	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 230 ton, 220 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 400 ton, 255 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cranes, 15 ton, 101 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Manlift, 60ft, 30 HP	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.01020**	**0.01020**	0.00000	0.00000	0.00000	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scrapers, Cat 637G, 500 HP	**0.335**	**0.335**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**		
Water Truck, 225 HP	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.050**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**		
Welding Unit, 70 HP	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Boom truck, 220 HP	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0132**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		
Tandem Dump Truck, 30 CY, 250 HP	**0.200**	**0.200**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**		
Concrete pump truck, 350 HP	0.0000	0.0000	0.0000	0.0000	0.0000	**0.0118**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Total =	**0.72**	**0.72**	0.26	0.20	0.07	0.08	0.08	0.08	0.07	0.07	0.07	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.215
Monthly Emissions (lbs/month) =	18.1	18.1	6.5	4.9	1.8	2.1	2.1	2.1	1.7	1.7	1.7	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	5.41
Annual Emissions (lbs/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	65	47	29	22	17	15	13	11	9	7	6	4	0	65.0	64.96
Annual Emissions (tons/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.0325	0.032
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**0.200**	**0.200**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.07	0.033

	Daily N_2O Emissions (lbs/day)																									
Equipment Month:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Pile driving equipment, 255 HF	0.00E+00	0.00E+00	**8.59E-04**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Roller Compactor, 100 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.78E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Backhoe, 150 HP	0.00E+00	0.00E+00	**2.71E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Forklift, CAT V200, 175 HP	0.00E+00	0.00E+00	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	**9.44E-04**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Bulldozer, Cat D8R, 305 HP	**2.45E-02**	**2.45E-02**	**2.45E-02**	**2.45E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**		
Motor Grader, 135 HP	0.00E+00	0.00E+00	**3.27E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Crane, pile lifting, 25 ton, 160 HF	0.00E+00	0.00E+00	**2.14E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Excavator, 195 HP	0.00E+00	0.00E+00	**4.68E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Cranes, 230 ton, 220 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Cranes, 400 ton, 255 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Cranes, 15 ton, 101 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Manlift, 60ft, 30 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.04E-03**	**2.04E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Scrapers, Cat 637G, 500 HP	**6.71E-02**	**6.71E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**		
Water Truck, 225 HP	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**1.00E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**		
Welding Unit, 70 HP	0.00E+00	0.00E+00	0.00E+00	**1.01E-03**	**1.01E-03**	**1.01E-03**	**1.01E-03**	**1.01E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Dump truck, Cat 770, 511 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.18E-02**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Boom truck, 220 HP	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**2.65E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**		
Tandem Dump Truck, 30 CY, 250 HP	**4.00E-02**	**4.00E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**		
Concrete pump truck, 350 HP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.31E-01**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Total =	**1.44E-01**	**1.44E-01**	**5.17E-02**	**3.91E-02**	**1.46E-02**	**1.46E-01**	**1.66E-02**	**1.66E-02**	**1.36E-02**	**1.36E-02**	**1.36E-02**	**3.14E-02**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.146	0.054
Monthly Emissions (lbs/month) =	3.6	3.6	1.30	0.98	0.37	3.67	0.42	0.42	0.34	0.34	0.34	0.79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	1.35
Annual Emissions (lbs/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	16.2	12.6	9.0	7.7	6.7	6.3	2.7	2.2	1.8	1.5	1.1	0.8	0.0	16.2	16.24
Annual Emissions (tons/12-rolling months) :	-	-	-	-	-	-	-	-	-	-	-	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0081	0.0081
Tandem Dump Truck, 30 CY, 250 HP, offsite (lbs/12 months	**0.040**	**0.040**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.0067

Table G-7
Construction Fugitive Dust Process Rates
Dry Fermentation Anaerobic Digestion Facility Project

Construction Equipment Process Rates For Dust Calculations during Rough Grading

Equipment	Daily Process Rate/Unit	Units	Total Daily Process Rate Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Notes
Pile driving equipment, 255 HP	N/A	N/A																									
Roller Compactor, 100 HP	1.82	vmt/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.82**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4 trips/hr
Backhoe, 150 HP	540	tons/day	0.00	0.00	540.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Forklift, CAT V200, 175 HP	N/A	N/A																									
Bulldozer, Cat D8R, 305 HP	12	hrs/day	12.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Motor Grader, 135 HP	0.36	vmt/day	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.36**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4 trips/hr
Crane, pile lifting, 25 ton, 160 HP	N/A	N/A																									
Excavator, 195 HP	4,320	tons/day	0.00	0.00	4320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Manlift, 60ft, 30 HP	N/A	N/A																									
Scrapers, Cat 637G, 500 HP	12	hrs/day	24.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water Truck, 225 HP	27.3	vmt/day	27.27	27.27	27.27	27.27	27.27	27.27	27.27	27.27	27.27	27.27	27.27	27.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6 trips/hr
Welding Unit, 70 HP	N/A	N/A																									
Dump truck, Cat 770, 511 HP	31.6	vmt/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trucks per hour dump in the middle
Boom truck, 220 HP	N/A	N/A																									
Tandem Dump Truck, 30 CY, 250 HP	9.1	vmt/day	36.36	36.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Concrete pump truck, 350 HP	0.1	vmt/day	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Windblown Dust (active construction ar	1,783,500	scf/day	1,783,500	1,783,500	1,783,500	1,605,150	1,426,800	1,248,450	1,070,100	891,750	713,400	535,050	356,700	178,350	0	0	0	0	0	0	0	0	0	0	0	0	
Workers	0.0	vmt/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Delivery Trucks	0.00	vmt/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Longest dimension of construction site	2,000	feet																									

Table G-8
Fugitive Dust Emission Factor Equations
Dry Fermentation Anaerobic Digestion Facility Project

Notes - Fugitive Dust Emission Calculations

Wind erosion of active construction area - 'Source: "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996

Level 2 Emission Factor =	0.011	ton/acre-month
Construction Schedule =	30	days/month
=	0.7	lbs/acre-day
=	1.682E-05	PM10 lbs/scf-day
	6.728E-06	PM2.5 lbs/scf-day

Material Unloading - Source: AP-42, Section 13.2.4, 11/06

E = (k)(0.0032)[(U/5)^1.3]/[(M/2)^1.4]		
k = particle size constant =	0.35	for PM10
k = particle size constant =	0.05	for PM2.5
U = average wind speed =	3.47	m/sec (based on average of five years of wind data for Stockton)
=	7.76	mph
M = moisture content =	15.0%	(SCAQMD CEQA Handbook, Table A9-9-G-1, moist soil)
E = PM10 emission factor =	0.00012	lb/ton
E = PM2.5 emission factor =	0.000018	lb/ton

Loader Unpaved Road Travel - Source: AP-42, Section 13.2.2, 11/06

E = (k)[(s/12)^0.9][(W/3)^0.45]

k = particle size constant =	1.5	for PM10
k = particle size constant =	0.15	for PM2.5
s = surface silt content =	8.50	(AP-42, Table 13.2.2-1, 11/06, construction sites)
W = avg. vehicle weight =	33.35	tons (avg. of loaded and unloaded weights, 980H loader, Caterpillar Performance Handbook, 2006)
E = PM10 emission factor =	3.25	lb PM10/VMT
E = PM2.5 emission factor =	0.33	lb PM2.5/VMT
Soil Density =	1.5	ton/yd3 (Caterpillar Performance Handbook, 10/89)
Loader Bucket Capacity =	5	yd3 (980H loader, Caterpillar Performance Handbook, 2006)
=	7.50	ton/load
Daily Soil Transfer Rate =	18	ton/day (operating scheduled hrs/day)
Daily Loader Trips =	2	loading trips/day
Loading Travel Distance =	50	ft/load (estimated)
Daily Loader Travel Distance =	120	ft/day
=	0.0	mi/day

Excavator Trenching - Source: AP-42, Table 11.9-1 (dragline operations), 7/98

PM10 E = (0.75)(0.0021)(d^0.7)/(M^0.3) PM2.5 E = (0.017)(0.0021)(d^1.1)/(M^0.3)

d = drop height =	3	ft (estimated)
M = moisture content =	15.0%	(SCAQMD CEQA Handbook, Table A9-9-G-1, moist soil)
E = PM10 emission factor =	0.0015	PM10 lb/ton
E = PM2.5 emission factor =	0.000053	PM2.5 lb/ton
Excavating Rate =	240.0	yd3/hr (based on 2.0 yd3 bucket on a Cat. 345 excavator and a 30 sec. cycle time)
=	2,880	yd3/day for 1 unit @ 12 hrs/day of operation
Soil Density =	1.50	ton/yd3 (Caterpillar Performance Handbook, 10/89)
Daily Soil Transfer Rate =	4,320	ton/day (estimated)

Unpaved Road Travel - Source: AP-42, Section 13.2.2, 11/06.

E = (k)[(s/12)^0.9*(W/3)^0.45

k = particle size constant =	1.5	for PM10
k = particle size constant =	0.15	for PM2.5
s = silt fraction =	8.50	(AP-42, Table 13.2.2-1, 11/06, construction sites)
W = water truck avg. veh. weight =	10.0	tons empty (estimated)
=	39.4	tons loaded (estimated with 8,000 gallon water capacity)
=	24.7	tons average
W = dump truck avg. veh. weight =	15.0	tons (for heavy duty Diesel trucks
=	40.0	tons (for heavy duty Diesel trucks)
=	27.5	tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =	8.0	tons empty (estimated)
W = auto/pickup avg. vehicle weight =	2.4	tons (CARB Area Source Manual
W = delivery truck avg. veh. wt. =	27.5	tons (for heavy duty Diesel trucks
W = 3 ton truck avg. veh. Wt =	5.4	tons (estimate)
W = scraper avg. veh. wt. =	28.2	tons empty (615 scraper, Caterpillar Performance Handbook, 10/89)
	48.6	tons loaded (615 scraper, Caterpillar Performance Handbook, 10/89)
	38.4	tons mean weight
W = fuel truck avg. veh. weight =	8.0	tons empty (estimated)
=	18.2	tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
=	13.1	tons average

Gravel Road Travel - Source: AP-42, Section 13.2.2, 11/06.

E = (k)[(s/12)^0.9*(W/3)^0.45

k = particle size constant =	1.5	for PM10
k = particle size constant =	0.15	for PM2.5
s = silt fraction =	6.40	**(AP-42, Table 13.2.2-1, 11/06, gravel road)**
W = water truck avg. veh. weigh	10.0	tons empty (estimated)
=	39.4	tons loaded (estimated with 8,000 gallon water capacity)
=	24.7	tons average
W = dump truck avg. veh. weigh	15.0	tons (for heavy duty Diesel trucks)
=	40.0	tons (for heavy duty Diesel trucks)
=	27.5	tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =	8.0	tons empty (estimated)
W = auto/pickup avg. vehicle we	2.4	tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. =	27.5	tons (for heavy duty Diesel trucks)

Table G-8
Fugitive Dust Emission Factor Equations
Dry Fermentation Anaerobic Digestion Facility Project

Notes - Fugitive Dust Emission Calculations

E = water truck emission factor =	2.84 lb PM10/VMT	**E = auto/pickup emiss. factor :**	**0.77 lb PM10/VMT**
E = dump truck emission factor =	2.98 lb PM10/VMT	**E = delivery truck emiss. facto**	**2.31 lb PM10/VMT**
E = forklift emiss. factor =	1.71 lb PM10/VMT		
E = auto/pickup emiss. factor =	0.99 lb PM10/VMT	**E = auto/pickup emiss. factor :**	**0.08 lb PM2.5/VMT**
E = delivery truck emiss. factor =	2.98 lb PM10/VMT	**E = delivery truck emiss. facto**	**0.23 lb PM2.5/VMT**
E = 3-ton truck emiss. factor =	1.43 lb PM10/VMT		
E = scraper emiss. factor =	3.46 lb PM10/VMT	**Watering control efficiency (-) =**	**0.5**
		(Estimated from discussion in AP-42 Section 13.2.2, pp.	
E = fuel truck emiss. factor =	2.13 lb PM10/VMT	13.2.2-10 to 13.2.2-12, November 2006.)	
E = water truck emission factor =	0.28 lb PM2.5/VMT		
E = dump truck emission factor =	0.30 lb PM2.5/VMT		
E = forklift emiss. factor =	0.17 lb PM2.5/VMT		
E = auto/pickup emiss. factor =	0.10 lb PM2.5/VMT		
E = delivery truck emiss. factor =	0.30 lb PM2.5/VMT		
E = 3-ton truck emiss. factor =	0.14 lb PM2.5/VMT		
E = scraper emiss. factor =	0.35 lb PM2.5/VMT		
E = fuel truck emiss. factor =	0.21 lb PM2.5/VMT		

Unpaved Road Travel and Active Excavation Area Control - Source: Control of Open Fugitive Dust Sources, U.S EPA, 9/88

C = 100 - (0.8)(p)(d)(t)/(i)

p = potential average hourly daytime		
evaporation rate =	0.39	mm/hr (EPA document, Figure 3-2, summer)
evaporation rate =	0.294	mm/hr (EPA document, Figure 3-2, annual)
d = average hourly daytime traffic rate =	8.3	vehicles/hr (calculated)
t = time between watering applications =	1.00	hr/application (estimated)
i = application intensity =	1.4	L/m2 (typical level in EPA document, page 3-23)
C = average summer watering control efficiency =	98.1%	
C = average annual watering control efficiency =	98.6%	

Finish Grading - Source: AP-42, Table 11.9-1, 7/98 Control factor from AP-42, Chapter 11.9 (Western Surface Coal Mining), Figure 13.2.2-2, p.

PM10 E = (0.60)(0.051)(S^2.0) PM2.5 E = (0.031)(0.04)(S^2.5)

S = mean vehicle speed =	3.0	mph (estimate)
E = emission factor =	0.275	PM10 lb/VMT
E = emission factor =	0.0193	PM2.5 lb/VMT

Bulldozer Operation and Scraper Excavation - Source: AP-42, Table 11.9.1, 10/98

PM10 E = (0.75)(s^1.5)/(M^1.4) PM2.5 E = (0.105)(s^1.5)/(M^1.4)

s = silt content =	8.5%	(AP-42, Table 13.2.2-1, 12/03, construction haul route)
M = moisture content =	15.0%	(SCAQMD CEQA Handbook, Table A9-9-G-1)
E = emission factor =	0.42	PM10 lb/hr
E = emission factor =	0.23	PM2.5 lb/hr

Scraper Travel

W = mean vehicle weight =	28.2	tons empty (615E scraper, Caterpillar Performance Handbook, 10/89)
=	48.6	tons loaded (615E scraper, Caterpillar Performance Handbook, 10/89)
=	38.4	tons mean weight
Daily Scraper Haul Tonnage =	1,428	ton/day (estimated)
Scraper Load =	20.4	ton (615E scraper, Caterpillar Performance Handbook, 10/89)
Daily Scraper Loads =	70.00	loads/day
Daily Scraper Hauling Distance =	0.08	miles/load (estimated)
Daily Scraper Travel =	11.36	miles/day

Backhoe

Excavating Rate =	150.0	yd3/hr (based on 1.25 yd3 bucket on a Cat. 428D backhoe and a 30 sec. cycle time)
	360	yd3/day for 1 excavator @ scheduled hrs/day of operation
Soil Density =	1.50	ton/yd3 (Estimate)
Daily Soil Transfer Rate =	540	ton/day (estimated)

Notes - Fugitive Dust Emission Calculations

(1) Wind erosion emission factor for active construction area is based on "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996.
(2) Material unloading emission factors are based on AP-42, Section 13.2.4, 11/06. (Based on average annual wind speed recorded onsite and default soil moisture contents.)
(3) Trenching emission factor is based on AP-42, Table 11.9-2 (dragline operations), 1/95. (Based on default soil moisture content.)
(4) Unpaved surface travel emission factors for water trucks, loaders, dump trucks, forklifts, delivery trucks, are based on AP-42, Section 13.2.2, 11/06. (Based on default soil silt content.)
(5) Dust control efficiency for unpaved road travel and active excavation area is based on "Control of Open Fugitive Dust Sources", U.S. EPA, 9/88. (Based on default evaporation rate shown in EPA document, Figure 3-2, 9/88, and typical water application rate shown in EPA document, page 3-23, 9/88.)

Table G-9
Construction Equipment
Fugitive Dust Emission Factors
Dry Fermentation Anaerobic Digestion Facility Project

Fugitive Dust Controlled Emission Factors

Equipment	Units	Uncontrolled Emission Factor $PM_{2.5}$ (lbs/unit)	Uncontrolled Emission Factor PM_{10} (lbs/unit)	Control Factor (%)	Controlled Emission Factor $PM_{2.5}$ (lbs/unit)	Controlled Emission Factor PM_{10} (lbs/unit)	
Pile driving equipment, 255 HP	N/A						
Roller Compactor, 100 HP	vmt	0.33	3.25	98.6%	0.005	0.05	Calculated on Worksheet
Backhoe, 150 HP	tons	5.30E-05	1.51E-03	98.6%	7.57E-07	2.15E-05	Control factor from AP-42, Chapter 13.2.2 (Unpaved Roads), Figure 13.2.2-2, p. 13.2.2-12, November 2006.
Forklift, CAT V200, 175 HP	N/A						
Bulldozer, Cat D8R, 305 HP	hours	0.23	0.42	98.6%	0.00	0.01	Control factor from AP-42, Chapter 13.2.2 (Unpaved Roads), Figure 13.2.2-2, p. 13.2.2-12, November 2006.
Motor Grader, 135 HP	vmt	0.019	0.28	98.6%	0.0003	0.004	Control factor from AP-42, Chapter 13.2.2 (Unpaved Roads), Figure 13.2.2-2, p. 13.2.2-12, November 2006.
Crane, pile lifting, 25 ton, 160 HP	N/A						
Excavator, 195 HP	tons	5.30E-05	1.51E-03	98.6%	7.57E-07	2.15E-05	Control factor from AP-42, Chapter 13.2.2 (Unpaved Roads), Figure 13.2.2-2, p. 13.2.2-12, November 2006.
Manlift, 60ft, 30 HP	N/A						
Scrapers, Cat 637G, 500 HP	hours	0.23	0.42	98.6%	0.00	0.01	Control factor from AP-42, Chapter 13.2.2 (Unpaved Roads), Figure 13.2.2-2, p. 13.2.2-12, November 2006.
Water Truck, 225 HP	vmt	0.28	2.84	98.6%	0.0041	0.041	
Welding Unit, 70 HP	N/A						
Dump truck, Cat 770, 511 HP	vmt	0.30	2.98	98.6%	0.0043	0.043	
Boom truck, 220 HP	N/A						
Tandem Dump Truck, 30 CY, 250 HP	vmt	0.30	2.98	98.6%	0.0043	0.043	
Concrete pump truck, 350 HP	vmt	0.30	2.98		0.30	2.98	
Windblown Dust (active construction area)	sq.ft.	6.73E-06	1.682E-05	98.6%	9.60E-08	2.40E-07	
Worker Unpaved Road Travel	vmt	0.08	0.77	98.6%	0.0011	0.011	
Delivery Truck Unpaved Road Travel	vmt	0.23	2.31	98.6%	0.0033	0.033	

Table G-10
Construction Fugitive Dust Emissions
Dry Fermentation Anaerobic Digestion Facility Project

Daily Dust Emissions (lbs/day) - $PM_{2.5}$																									
Equipment Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Peak
Pile driving equipment, 255 HP																									
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.0084**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Backhoe, 150 HP	0.00	0.00	**0.00041**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Forklift, CAT V200, 175 HP																									
Bulldozer, Cat D8R, 305 HP	**0.040**	**0.040**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Motor Grader, 135 HP	0.00	0.00	**0.00010**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00010**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Crane, pile lifting, 25 ton, 160 HP																									
Excavator, 195 HP	0.00	0.00	**0.0033**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Cranes, 230 ton, 220 HP																									
Cranes, 400 ton, 255 HP																									
Cranes, 15 ton, 101 HP																									
Manlift, 60ft, 30 HP																									
Scrapers, Cat 637G, 500 HP	**0.079**	**0.079**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water Truck, 225 HP	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Welding Unit, 70 HP																									
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.13**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Boom truck, 220 HP	**0.00**	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tandem Dump Truck, 30 CY, 250 HP	**0.15**	**0.15**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	**0.027**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Windblown Dust (active construction area)	**0.17**	**0.17**	**0.17**	**0.15**	**0.14**	**0.12**	**0.10**	**0.086**	**0.068**	**0.051**	**0.034**	**0.017**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Worker Unpaved Road Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Delivery Truck Unpaved Road Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total =	**0.55**	**0.55**	**0.29**	0.26	0.25	0.26	0.21	0.20	0.18	0.16	0.14	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.55**
Monthly Emissions (lbs/month) =	13.97	13.97	7.18	6.66	6.23	6.48	5.37	4.94	4.50	4.07	3.64	6.81	0	0	0	0	0	0	0	0	0	0	0	0	**14**
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	84	70	56	49	42	36	29	24	19	15	10	7	0	84
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	0.042	0.035	0.028	0.024	0.021	0.018	0.015	0.012	0.0095	0.0073	0.0052	0.0034	0	0.0419
Daily Dust Emissions (lbs/day) - PM_{10}																									
Equipment Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Pile driving equipment, 255 HP																									
Roller Compactor, 100 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.084**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Backhoe, 150 HP	0.00	0.00	**0.012**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Forklift, CAT V200, 175 HP																									
Bulldozer, Cat D8R, 305 HP	**0.072**	**0.072**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Motor Grader, 135 HP	0.00	0.00	**0.0014**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.0014**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Crane, pile lifting, 25 ton, 160 HP																									
Excavator, 195 HP	0.00	0.00	**0.093**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Cranes, 230 ton, 220 HP																									
Cranes, 400 ton, 255 HP																									
Cranes, 15 ton, 101 HP																									
Manlift, 60ft, 30 HP																									
Scrapers, Cat 637G, 500 HP	**0.14**	**0.14**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water Truck, 225 HP	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Welding Unit, 70 HP																									
Dump truck, Cat 770, 511 HP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.34**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Boom truck, 220 HP	**0.00**	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tandem Dump Truck, 30 CY, 250 HP	**1.55**	**1.55**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Concrete pump truck, 350 HP	0.00	0.00	0.00	0.00	0.00	**0.27**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Windblown Dust (active construction area)	0.43	0.43	0.43	0.39	0.34	0.30	0.26	0.21	0.17	0.13	0.09	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Worker Unpaved Road Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Delivery Truck Unpaved Road Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total =	**3.29**	**3.29**	1.64	1.49	1.45	1.68	1.36	1.32	1.28	1.23	1.19	**2.58**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**3.29**
Monthly Emissions (lbs/month) =	82.9	82.9	41.3	37.5	36.4	42.2	34.3	33.2	32.1	31.0	30.0	64.9	0	0	0	0	0	0	0	0	0	0	0	0	**83**
Annual Emissions (lbs/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	549	466	383	342	304	268	225	191	158	126	95	65	0.00	549
Annual Emissions (tons/12-rolling months) =	-	-	-	-	-	-	-	-	-	-	-	0.27	0.23	0.19	0.17	0.15	0.13	0.11	0.10	0.079	0.063	0.047	0.032	0	0.27

Table G-11
Fugitive Dust Emission Equations
Dry Fermentation Anaerobic Digestion Facility Project

Table G-11 - Fugitive Dust Emission Calculations

(1) Paved Road Travel - Source: AP-42, Section 13.2.1, 2010

E = k(sL/2)^0.98*(W/3)^0.53(S/30)^0.16 lb/VMT - PM10

	PM_{10}		$PM_{2.5}$	
k = particle size constant =	0.015	lb/VMT - PM_{10}	0.0037	lb/VMT - $PM_{2.5}$
sL = silt loading =	0.015	g/m2 (AP-42, Table 13.2.1-2, page 13.2.1-8, limited access	0.015	g/m2 (AP-42, Table 13.2.1-2, page 13.2.1-8, limited access roads)
W = auto/pickup truck avg. vehicle weight =	2.4	tons (CARB Area Source Manual, 9/97)	2.4	tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. vehicle weight =	5.00	tons (for medium-duty Diesel trucks)	5.00	tons (for medium-duty Diesel trucks)
W = soil haul truck avg. vehicle weight =	**30.00**	tons (for heavy duty Diesel trucks)	**30.00**	tons (for heavy duty Diesel trucks)
S = average speed	15	mph	15	mph
E = auto/pick truck emission factor =	9.87E-05	lb/VMT - PM_{10}	2.43E-05	lb/VMT - $PM_{2.5}$
E = delivery truck emission factor =	1.46E-04	lb/VMT - PM_{10}	3.59E-05	lb/VMT - $PM_{2.5}$
E = soil haul truck emission factor =	**3.76E-04**	lb/VMT - PM_{10}	**9.28E-05**	lb/VMT - $PM_{2.5}$

(2) Wind erosion of active construction area - 'Source: "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996

Level 2 Emission Factor =	0.011	ton/acre-month
Construction Schedule =	5	days/week
=	1.0	lbs/acre-day
=	0.000023	lbs/sf-day

(3) Finish Grading - Source: AP-42, Table 11.9-2, 1/95

E = (0.60)(0.051)(S^2.0) lb/VMT

S = mean vehicle speed =	3.0	mph (estimated)
E = emission factor =	0.2754	lb/VMT

(4) Bulldozer Operation and Scraper Excavation - Source: AP-42, Table 11.9.2, 1/95

E = (0.75)(s^1.5)/(M^1.4) lb/hr

s = silt content =	6.9%	(AP-42, Table 11.9-3, 1/95, overburden)
M = moisture content =	7.9%	(AP-42, Table 11.9-3, 1/95, overburden)
E = emission factor =	0.75	lb/hr

(5) Scraper Travel

W = mean vehicle weight =	57.3	tons empty (637G scraper, Caterpillar Performance Handbook 40 Jan 2010)
=	98.1	tons loaded (637G scraper, Caterpillar Performance Handbook 40 Jan 2010)
=	77.7	tons mean weight
Daily Scraper Haul Tonnage =	4,167	ton/day (estimated)
Scraper Load =	40.8	ton (637G scraper, Caterpillar Performance Handbook 40 Jan 2010)
Daily Scraper Loads =	102	loads/day
Daily Scraper One-Way Hauling Distance =	**0.32**	miles/load (estimated)
Daily Scraper Travel =	65.23	miles/day

(6) Material Unloading - Source: AP-42, p. 13.2.4-3, 1/95

E = (k)(0.0032)[(U/5)^1.3]/[(M/2)^1.4] lb/ton

k = particle size constant =	0.35	for PM10
U = average wind speed =	2.49	m/sec (based on 5 years of Hanford, CA wind data)
=	5.58	mph
M = moisture content =	7.9%	(AP-42, Table 11.9-3, 1/95, overburden)
E = emission factor =	0.00019	lb/ton

(7) Loader Unpaved Road Travel - Source: AP-42, Section 13.2.2, 1/95

E = (k)[(s/12)^0.8][(W/3)^0.4]/[(M/0.2)^0.3] lb PM10/VMT

k = particle size constant =	2.6	
s = surface silt content =	6.9%	(AP-42, Table 11.9-3, 1/95, overburden)
M = surface moisture content =	7.9%	(AP-42, Table 11.9-3, 1/95, overburden)
W = avg. vehicle weight =	18.50	tons (avg. of loaded and unloaded weights, 966E loader, Caterpillar Performance Handbook, 10/89)
E = emission factor =	0.11	lb PM10/VMT
Soil Density =	1.05	ton/yd3 (Caterpillar Performance Handbook, 10/89)
Loader Bucket Capacity =	4.75	yd3 (966E loader, Caterpillar Performance Handbook, 10/89)
=	4.99	ton/load
Daily Soil Transfer Rate =	1,042	ton/day (estimated)
Daily Loader Trips =	209	loading trips/day
Loading Travel Distance =	203.7	ft/load (estimated)
Daily Loader Travel Distance =	42,544	ft/day
=	8.1	mi/day

(8) Backhoe Trenching - Source: AP-42, Table 11.9-2 (dragline operations), 1/95

E = (0.75)(0.0021)(d^0.7)/(M^0.3) lb/yd3

d = drop height =	3	ft (estimated)
M = moisture content =	7.9%	(AP-42, Table 11.9-3, 1/95, overburden)
E = emission factor =	0.0018	lb/yd3
E = emission factor =	0.7283	lbs/day = 0.09103 lbs/hr
Backhoe Excavating Rate =	49.8	yd3/hr (E70B backhoe, Caterpillar Performance Handbook, 10/89)
=	398	yd3/day for 1 backhoe @ 8 hr/day

(9) Excavator Trenching - Source: AP-42, Table 11.9-2 (dragline operations), 1/95

E = (0.75)(0.0021)(d^0.7)/(M^0.3) lb/yd3

d = drop height =	3	ft (estimated)
M = moisture content =	7.9%	(AP-42, Table 11.9-3, 1/95, overburden)
E = emission factor =	0.0018	lb/yd3
E = emission factor =	6.2474	lbs/day = 0.78092 lbs/hr
Excavator Excavating Rate =	427.2	yd3/hr (225D excavator, Caterpillar Performance Handbook, 10/89)
=	3,418	yd3/day for 1 excavator @ 8 hr/day

(10) Unpaved Road Travel - Source: AP-42, Section 13.2.2, 11/06.

PM_{10}

E = (k)[(s/12)^0.9][(W/3)^0.45]

k = particle size constant =	1.5	
s = silt fraction =	6.4%	(AP-42, Table 13.2.2-1, 11/06, MSW landfills)
W = water truck avg. veh. weight =	10.0	tons empty (estimated)
=	39.4	tons loaded (estimated with 8,000 gallon water capacity)
=	24.7	tons average
W = fuel truck avg. veh. weight =	8.0	tons empty (estimated)
=	18.2	tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
=	13.1	tons average
W = service truck avg. veh. weight =	5.0	tons (estimated)
W = dump truck avg. veh. weight =	15.0	tons (empty, for heavy duty Diesel trucks)
=	45.0	tons (loaded, for heavy duty Diesel trucks)
=	30.0	tons (average, for heavy duty Diesel trucks)
W = concrete pumper truck avg. veh. wt. =	15.0	tons (for heavy duty Diesel trucks)
=	40.0	tons (for heavy duty Diesel trucks)
=	27.5	tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =	8.0	tons empty (estimated)
W = auto/pickup avg. vehicle weight =	2.4	tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. =	5.0	tons (same as for service trucks)
W = scraper avg. veh. wt. =	73.4	tons empty (651E scraper, Caterpillar Performance Handbook, 10/89)
	125.4	tons loaded (651E scraper, Caterpillar Performance Handbook, 10/89)
	99.4	tons mean weight
E = water truck emission factor =	0.035	lb/VMT - PM_{10}
E = fuel truck emission factor =	0.026	lb/VMT - PM_{10}
E = service truck emission factor =	0.017	lb/VMT - PM_{10}
E = dump truck emission factor =	0.038	lb/VMT - PM_{10}
E = concrete pumper truck emiss. factor =	0.037	lb/VMT - PM_{10}
E = forklift emission factor =	0.021	lb/VMT - PM_{10}
E = 5th wheel truck emiss. factor =	0.021	lb/VMT - PM_{10}
E = auto/pickup emiss. factor =	0.012	lb/VMT - PM_{10}
E = delivery truck emiss. factor =	0.017	lb/VMT - PM_{10}
E = scraper emiss. factor =	0.065	lb/VMT - PM_{10}

$PM_{2.5}$

E = (k)[(s/12)^0.9][(W/3)^0.45]

k = particle size constant =	0.15	
s = silt fraction =	6.4%	(AP-42, Table 13.2.2-1, 11/06, MSW landfills)
W = water truck avg. veh. weight =	10.0	tons empty (estimated)
=	39.4	tons loaded (estimated with 8,000 gallon water capacity)
=	24.7	tons average
W = fuel truck avg. veh. weight =	8.0	tons empty (estimated)
=	18.2	tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
=	13.1	tons average
W = service truck avg. veh. weight =	5.0	tons (estimated)
W = dump truck avg. veh. weight =	15.0	tons (empty, for heavy duty Diesel trucks)
=	0.0	tons (loaded, for heavy duty Diesel trucks)
=	7.5	tons (average, for heavy duty Diesel trucks)
W = concrete pumper truck avg. veh. wt. =	15.0	tons (for heavy duty Diesel trucks)
=	40.0	tons (for heavy duty Diesel trucks)
=	27.5	tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =	8.0	tons empty (estimated)
W = auto/pickup avg. vehicle weight =	2.4	tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. =	5.0	tons (same as for service trucks)
W = scraper avg. veh. wt. =	73.4	tons empty (651E scraper, Caterpillar Performance Handbook, 10/89)
	125.4	tons loaded (651E scraper, Caterpillar Performance Handbook, 10/89)
	99.4	tons mean weight
E = water truck emission factor =	0.0035	lb/VMT - PM_{10}
E = fuel truck emission factor =	0.0026	lb/VMT - PM_{10}
E = service truck emission factor =	0.0017	lb/VMT - PM_{10}
E = dump truck emission factor =	0.0020	lb/VMT - PM_{10}
E = concrete pumper truck emiss. factor =	0.0037	lb/VMT - PM_{10}
E = forklift emission factor =	0.0021	lb/VMT - PM_{10}
E = 5th wheel truck emiss. factor =	0.0021	lb/VMT - PM_{10}
E = auto/pickup emiss. factor =	0.0012	lb/VMT - PM_{10}
E = delivery truck emiss. factor =	0.0017	lb/VMT - PM_{10}
E = scraper emiss. factor =	0.0065	lb/VMT - PM_{10}

(11) Unpaved Road Travel and Active Excavation Area Control - Source: Control of Open Fugitive Dust Sources, U.S EPA, 9/88

C = 100 - (0.8)(p)(d)(t)/(i)

p = potential average hourly daytime evaporation rate =	0.4225	mm/hr (EPA document, Figure 3-2, summer)
d = average hourly daytime traffic rate =	100.0	vehicles/hr (estimated)
t = time between watering applications =	0.25	hr/application (estimated)
i = application intensity =	0.7	L/m2 (typical level in EPA document, page 3-23)
C = average watering control efficiency =	88.4%	

(12) Wind Errosion of Storage Piles - Source: EPA's "Control of Open Fugitive Dust Sources", 9/88, Chapter 4.

Max. Hourly Ave. WS at 10m [1] (m/s)	Fastest [2] Mile @ 10m (m/s)	Threshold Friction Velocity [3] (m/s)	Roughness Height(3) (m)	Threshold Fastest Mile @ 10m (m/s)	TSP Emission Factor [4] (g/m^2)	PM10 Factor [5]	PM10 Emission Factor (g/m^2)	PM10 Emission Factor (lbs/ft^2)
8.90	10.18	0.53	0.0003	13.79	0.000	0.50	0.00E+00	0.00E+00

Notes:
1- maximum hourly average wind speed based on onsite wind data.
2 - calculated based on fastest mile conversion factor.
3 - from Table 4-4 of EPA document (construction site).
4- from equation 4-4 of EPA document.
5 - from equation 4-3 of EPA document.

Table G-12
ONSITE AND OFFSITE DAILY PEAK AND PERIOD CONSTRUCTION EMISSIONS
DRY FERMENTATION ANAEROBIC DIGESTION FACILITY PROJECT

Mobile Source	Maximum Number of Units Per Day[12]	Paved and Unpaved Round-Trip Distance Traveled[2]		NOx			POC			PM_{10} (combustion)			SOx			CO			CO_2			CH_4[4,5,8]			N_2O[7]			Paved Road Fugitive PM_{10} Dust			Paved Road Round-Trip Distance Traveled[3]		Onsite Paved Offsite Unpaved Road Fugitive Dust			Onsite Paved Offsite Unpaved Road Round-Trip Distance Traveled[3]		Paved Road Fugitive $PM_{2.5}$ Dust			Office Bldg Paved Road Round-Trip Distance Traveled[3]		Onsite Paved Offsite Unpaved Road Fugitive$PM_{2.5}$ Dust		
				NOx Emission Factor[2]	Emission Rate		POC Emission Factor[2]	Emission Rate		PM_{10} Emission Factor[2]	Emission Rate		SOx Emission Factor[2]	Emission Rate		CO Emission Factor[2]	Emission Rate		CO_2 Emission Factor[2]	Emission Rate		CH_4 Emission Factor[5]	Emission Rate		N_2O Emission Factor[2]	Emission Rate		Paved PM_{10} Emission Factor[21]	PM_{10} Emission Rate				Onsite Paved Offsite Unpaved PM_{10} Emission Factor[21]	PM_{10} Emission Rate				Paved $PM_{2.5}$ Emission Factor[21]	$PM_{2.5}$ Emission Rate				Onsite Paved Offsite Unpaved $PM_{2.5}$ Emission Factor[22]	$PM_{2.5}$ Emission Rate	
		(mi/day/ vehicle)	(mi/period/ vehicle)[1]	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(g/mi)	(lbs/day)	(tons/yr)	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/period / vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)	(mi/day/ vehicle)	(mi/yr/ vehicle)[1]	(lb/VMT)	(lbs/day)	(tons/yr)
On-Site[3]																																													
Fill Soil Haul Trucks Traveling (Diesel)[9]	99	0.53	19	18.03	2.07	0.037	3.03	0.35	0.0063	1.06	0.122	2.19E-03	0.024	2.76E-03	4.97E-05	12.82	1.47	0.03	2,527	290.6	5.2	0.11	1.23E-02	2.22E-04	0.021	2.47E-03	4.44E-05	3.76E-04	7.73E-03	1.21E-03	0.21	65	3.76E-04	1.19E-02	1.86E-03	0.32	100	9.28E-05	1.91E-03	2.97E-04	-	-	9.28E-05	2.93E-03	4.58E-04
Soil Haul Trucks Idling (Diesel)[14,15]	99	1,130 (min/dy)	640.2 (hr/period)	109.47 (g/hr)	450	7.65	#########	49.42	0.84	#######	7.59	1.29E-01	########	2.55E-01	4.33E-03	48.45 (g/hr)	199.13	3.39	6,542 (g/hr)	26,884	457	#######	1.14E+00	1.94E-02	#########	2.28E-01	3.88E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Delivery Trucks (light-heavy duty diesel)[9]	10	0.092	28.7	1.42	2.87E-03	4.48E-04	2.79E-01	5.66E-04	8.83E-05	5.30E-02	1.07E-04	1.68E-05	1.00E-02	2.03E-05	3.16E-06	2.86E+00	5.81E-03	9.06E-04	1,004	2.0	0.32	0.11	2.17E-04	3.39E-05	0.021	4.35E-05	6.78E-06	3.76E-04	3.46E-04	5.40E-05	0.092	29	-	-	-	-	-	9.28E-05	8.54E-05	1.33E-05	0.092	29	-	-	-
Soil fill workers Light Duty Trucks (gasoline)[10]	12	0.092	3.3	0.51	1.24E-03	2.23E-05	3.30E-01	8.03E-04	1.45E-05	5.10E-02	1.24E-04	2.23E-06	7.00E-03	1.70E-05	3.07E-07	6.38E+00	1.55E-02	2.79E-04	702	1.7	0.03	0.028	6.84E-05	1.23E-06	0.0056	1.37E-05	2.46E-07	9.87E-05	1.09E-04	1.96E-06	0.092	3.3	9.87E-05	1.09E-04	2E-06	0.092	3.3	2.43E-05	2.69E-05	4.83E-07	0.092	3.3	2.43E-05	2.69E-05	4.83E-07
Phase 1 construction workers Light Duty Trucks (gasoline)[10]	45	0.092	25.4	0.508	4.64E-03	6.40E-04	3.30E-01	3.01E-03	4.16E-04	5.10E-02	4.65E-04	6.42E-05	7.00E-03	6.39E-05	8.81E-06	6.38E+00	5.82E-02	8.03E-03	702	6.4	0.88	0.028	2.57E-04	3.54E-05	0.0056	5.13E-05	7.08E-06	9.87E-05	4.08E-04	5.63E-05	0.092	25	9.87E-05	4.08E-04	7.3E-06	0.092	25	2.43E-05	1.01E-04	1.81E-06	0.092	25	2.43E-05	1.01E-04	1.39E-05
Subtotal:					451.9	7.69		49.8	0.85		7.72	0.13		0.26	0.0044		200.62	3.41		27178	463		1.2	0.020		2.31E-01	3.93E-03		0.008	0.0013				1.20E-02	1.86E-03				2.02E-03	3.11E-04				2.96E-03	4.58E-04
Off-Site[11]																																													
Fill Soil Haul Trucks Traveling (Diesel)[9]	99	1.04	37	18.03	4.09	0.074	0.76	0.17	0.0016	0.58	0.13	0.0024	0.015	3.41E-03	6.13E-05	4.66	1.1	0.019	1,606	365	6.6	0.11	0.024	4.38E-04	0.021	4.87E-03	8.76E-05	3.76E-04	1.94E-02	3.49E-04	0.52 (23)	18.7	3.81E-02	1.96E+00	1.88E-01	0.52 (23)	18.7	9.28E-05	4.78E-03	8.60E-05	-	-	2.04E-03	1.05E-01	1.89E-03
Soil Haul Trucks Idling (Diesel)[14,15]	99	1,130 (min/dy)	640.2 (hr/period)	109.47 (g/hr)	450	7.65	#########	49.42	0.84	#######	7.59	1.29E-01	########	2.55E-01	4.33E-03	48.45 (g/hr)	199.13	3.39	6,542 (g/hr)	26,884	457	#######	1.14E+00	1.94E-02	#########	2.28E-01	3.88E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Delivery Trucks (light-heavy duty diesel)[9]	10	50	18,250	1.59	1.75	0.320	0.067	0.0739	0.013481	0.034	0.037	0.0068	0.0050	5.51E-03	1.01E-03	1.22	1.34	0.24	511	563	103	0.11	1.18E-01	2.16E-02	0.021	2.36E-02	4.31E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soil fill workers Light Duty Trucks (gasoline)(10)	12	50	1,800	0.508	0.67	0.0121	0.158	0.21	3.76E-03	0.033	0.044	0.00079	0.0050	6.62E-03	1.19E-04	4.41	5.84	0.11	482	638	11.5	0.028	3.72E-02	6.70E-04	0.0056	7.44E-03	1.34E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 1 construction workers Light Duty Trucks (gasoline)(10)	45	50	13,800	0.508	2.52	0.348	0.158	0.78	1.08E-01	0.033	0.164	0.023	0.0050	2.48E-02	3.42E-03	4.41	21.9	3.02	482	2,391	330	0.028	1.40E-01	1.93E-02	0.0056	2.79E-02	3.85E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal:					456	8.05		49.9	0.859		7.8	0.139		0.270	0.0055		207.36	3.75		28450	578		1.3	0.042		0.26	0.0084		0.02	0.0003				1.96E+00	1.88E-01				4.78E-03	8.60E-05				1.05E-01	1.89E-03
TOTAL	=				-	7.69		99.6	1.706		15.5	0.270		0.528	0.0099		407.987	7.17		55,628	1040		2.5	0.062		0.494	0.0123		0.028	0.0016				1.97E+00	1.90E-01				6.80E-03	3.97E-04				1.08E-01	2.35E-03

-- = Not applicable.
1) 36 construction days, assuming 6 days per week.
2) Emission factors from EMFAC2007 for Bay Area, 15 mph onsite, 55 mph offsite for Diesel-fueled trucks, and 65 mph offsite for gasoline-fueled vehicles. PM_{10} includes exhaust and tire and brake wear.
3) Assumes heavy-duty soil haul trucks travel from southeast corner site entrance to the west end of site (ft) = 1,391 424 meters
Assumes employee and visitor vehicles and delivery trucks travel distance from southwest corner site entrance to the parking lot next to the office building (ft) = 243 74 meters
4) CH_4 emitted by combustion of Diesel fuel or gasoline (g CH4/MMBtu) = 3.0 ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
5) Energy content of Diesel fuel (Btu/gal) = 138,691 U.S. EIA. Energy Calculators, http://www.eia.doe.gov/kids/energy.cfm?page=about_energy_conversion_calculator-basics
Energy content of gasoline (Btu/gal) = 114,855 Grohmann et al. *Potential for Fuels from Biomass*, Table II, p. 359.
6) Diesel fuel consumption rate of heavy-duty haul trucks (mi/gal) = 3.883 EMFAC2007
Gasoline consumption rate of employee and visitor vehicles (mi/gal) = 12.25 EMFAC2007
7) N_2O emitted by combustion of Diesel fuel or gasoline (g N_2O/MMBtu) = 0.6 ARB. Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.
8) Materials haul trucks are assumed to be heavy heavy-duty (HHD) category in EMFAC2007.
9) Delivery trucks are assumed to be light heavy-duty (LHD1) category in EMFAC2007.
10) Construction worker vehicles are assumed to be light-duty truck (LDT1) category in EMFAC2007.
11) Assumes soil haul trucks travel to entrance (mi) = 0.52 November 6, 2010 email from Julie Mier suggests that adjacent Zanker Landfill will be source of 100,000 cy soil fill.
Assumes employee and visitor vehicles and delivery trucks travel to entrance (mi) = 25 (Estimate)
12) No. of large capacity transfer trucks (/day) = 105 to bring organic portion of MSW to the Project
no. of collection route type trucks (/day) = 45
no. of finished product trucks (/day) = 60 to take away finished product from the Project.
no. of amendment materials trucks (/day) = 13
13) Offsite distance for amendment materials hauled from Zanker Landfill to site boundary (ft) = 400 3,195
14) Each of the 4 soil haul trucks assumed to idle when not dumping or loading soil during 12-hour weekday (minutes) = 1,129.7
15) Idling CH4 and N2O emission factors proportioned from EMFAC2007 CO2 emission factor with the same ratios as for the trucks traveling on site.
16) Entry paved road length (m) = 167
16A) Offsite unpaved road length (m) = 330
17) Soil fill unpaved road length (m) = 257
18) Phase 2 paved unpaved road length (m) = 206
19) Phase 3 paved unpaved road length (m) = 358
20) Paved unpaved road length to finished product stockpile (m) = 216
21) See Worksheet "Dust E Factors".
22) See Worksheet "Dust Factors".
23) Soil haul truck road offsite on landfill assumed to be half paved and half unpaved.
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Table G-13
Construction Emissions
Dry Fermentation Anaerobic Digestion Facility Project

Daily and Annual Construction Emissions

Average Daily Construction Emissions (lbs/day)

	NOx	CO	POC/VOC	SOx	Combustion $PM_{2.5}$	Combustion PM_{10}	Fugitive $PM_{2.5}$	Fugitive PM_{10}	CO_2	CH_4	N_2O
Onsite											
Construction Equipment	21.93	8.03	2.38	0.025	0.849	0.849	-	-	3,997	0.215	0.054
Fugitive Dust	-	-	-	-	-	-	0.28	1.82	-	-	-
Truck deliveries	2.87E-03	5.81E-03	5.66E-04	2.03E-05	1.07E-04	1.07E-04	-	-	2.04	2.17E-04	4.35E-05
Worker Travel	4.07E-03	5.11E-02	2.64E-03	5.61E-05	4.08E-04	4.08E-04	-	-	5.6	2.25E-04	4.51E-05
Onsite Subtotal (lbs/day):	21.938	8.090	2.387	0.025	0.850	0.850	0.278	1.817	4005	0.216	0.054
Offsite											
Tandem Dump trucks	3.520	0.978	0.369	0.004	0.123	0.123	-	-	604	0.033	0.007
Fugitive Dust	-	-	-	-	-	-	0.274	1.793	-	-	-
Truck deliveries	1.752	1.341	0.074	0.006	0.037	0.037	-	-	563	0.022	0.024
Worker Travel	2.212	19.214	0.688	0.022	0.144	0.144	-	-	2099	0.122	0.024
Offsite Subtotal =	7.48	21.53	1.13	0.032	0.30	0.30	0.27	1.79	3,266	0.177	0.055
Onsiste + Offsite Total =	29.42	29.62	3.52	0.057	1.15	1.15	0.55	3.61	7,271	0.39	0.11

Annual Construction Emissions (tons/year, 12-month period for Phase 1)

	NOx	CO	POC/VOC	SOx	Combustion $PM_{2.5}$	Combustion PM_{10}	Fugitive $PM_{2.5}$	Fugitive PM_{10}	CO_2	CH_4	N_2O
Onsite											
Construction Equipment	3.31	1.21	0.360	0.0038	**0.1283**	0.1283	-	-	604	0.0325	0.0081
Fugitive Dust	-	-	-	-	-	-	0.0419082	0.27	-	-	-
Truck deliveries	4.48E-04	9.06E-04	8.83E-05	3.16E-06	1.68E-05	1.68E-05	-	-	0.32	3.39E-05	6.78E-06
Worker travel	6.62E-04	8.31E-03	4.30E-04	9.12E-06	6.65E-05	6.65E-05	-	-	0.91	3.67E-05	7.33E-06
Onsite Subtotal (tons/year):	3.313	1.222	0.360	0.0038	0.128	0.128	0.042	0.274	604.789	0.033	0.008
Onsite Subtotal (g/sec):	0.191	0.070	0.021	0.00022	0.0074	0.0074	0.0024	0.016	34.795	0.002	0.000
Offsite											
Tandem Dump trucks	0.532	0.148	0.056	0.00067	0.0185	0.0185	-	-	91.1	0.0050	0.00101
Fugitive Dust	-	-	-	-	-	-	0.27	1.77	-	-	-
Worker travel	0.36	3.13	0.11	0.0035	0.023	0.023	-	-	342	1.99E-02	3.99E-03
Truck Deliveries	0.32	0.24	0.013	0.0010	0.0068	0.0068	-	-	103	0.022	4.31E-03
Offsite Subtotal =	1.21	3.52	0.18	0.0052	0.049	0.049	0.27	1.77	535	0.047	0.0093
Onsiste + Offsite Total =	4.52	4.74	0.54	0.0090	0.18	0.18	0.31	2.04	1140	0.079	0.017

Maximum Daily Construction Emissions (lbs/day, peak activity for modeling)

	NOx	CO	POC/VOC	SOx	Combustion $PM_{2.5}$	Combustion PM_{10}	Fugitive $PM_{2.5}$	Fugitive PM_{10}	CO_2	CH_4	N_2O
Onsite											
Construction Equipment	74.50	28.05	7.99	0.081	**2.837**	2.837	-	-	15,200	0.721	0.146
Fugitive Dust	-	-	-	-	-	-	0.55	3.29	-	-	-
Truck deliveries	2.87E-03	5.81E-03	5.66E-04	2.03E-05	1.07E-04	1.07E-04	-	-	2.04	2.17E-04	4.3456E-05
Worker Travel	1.24E-03	1.55E-02	8.03E-04	1.70E-05	1.24E-04	1.24E-04	-	-	1.7	6.84E-05	1.37E-05
Onsite Subtotal (lbs/day):	74.50	28.07	7.99	0.08	2.84	2.84	0.55	3.29	15204	0.72	0.15
Onsite Subtotal (g/sec):	0.78	0.29	0.084	0.00085	0.030	0.030	0.0058	0.035	160	0.0076	0.0015

Table G-14
Construction and
BAAQMD CEQA Air Quality Significance Criteria and Thresholds
Dry Fermentation Anaerobic Digestion Facility Project

Parameter	Units	Emission Rate													
		NOx	POC/ ROG	Combustion PM_{10}	Combustion $PM_{2.5}$	Fugitive PM_{10}	Fugitive $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	SO_2	CO	HAPs[a]	CO_2	CH_4	N_2O
Soil Filling Construction, onsite[b]	lbs/day	21.9	2.39	0.85	0.85	1.8	0.28	2.7	1.1	0.025	8.1	2.4 (c)	4,005	0.22	0.054
Soil Filling Equipment, offsite[b]	lbs/day	7.5	1.13	0.30	0.30	1.8	0.2739	2.1	0.58	0.032	21.5	1.13	3,266	0.177	0.055
Facility Construction Maximum Potential Daily Emissions	lbs/day	29.4	3.5	1.2	1.2	3.6	0.55	4.8	1.7	0.05673	29.6	3.5	7,271	0.39	0.11
BAAQMD CEQA Project (Facility) Significance Threshold for Average Daily Emissions[d]	lbs/day	**54**	54	82	54	None	None	NA	NA	None	AAQS[e]	NA	NA	NA	NA
Facility Daily Emissions Potentially Significant?	-	No	No	No	No	NA	NA	NA	NA	NA	No	No	NA	NA	NA
Soil filling and Phase 1 Construction	tpy	4.5	0.54	0.18	0.18	2.04	0.31	2.22	0.49	0.0090	4.74	0.54	1,140	0.079	0.017

[a] Hazardous air pollutants

[b] Soil filling accomplished with 4 tandem dump trucks, 2 Cat 637G scrapers, 1 Cat D8R track dozer, 1 boom truck, 1 water truck, and 12 workers.

[c] Conservatively assumed equal to total ROG emissions.

[d] BAAQMD. "CEQA Air Quality Guidelines", June 2010.

[e] In terms of 1-hour and 8-hour ambient air quality standards.

Appendix H
Cumulative Air Quality Impact Analysis

Table H-1
San Jose Water Pollution Control Plant
Maximum Toxic Air Contaminant Emission Rates[1]

Engine Toxic Air Contaminant[1]	Molecular Weight[1]	Concentration		Maximum Hourly Emission Rate			Maximum Annual Emission Rate[7]		
		ppmv		lbs/hr			tons/year		
	lbs/lb-mole	Biogas[2]	WPCP Engine Exhaust[3]	P&E Bldg Engines, one[4]	Secondary Blower Bldg Engines, one[5]	Bldg 40 Engine, one[6]	P&E Bldg Engines, one	Secondary Blower Bldg Engines, one	Bldg 40 Engine, one
Ammonia[2A]	17.031	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane (methyl chloroform)	133.4	2.07E-01	5.78E-03	8.44E-05	1.84E-04	2.68E-04	3.69E-04	8.08E-04	1.17E-03
1,1,2,2-Tetrachloroethane	167.85	6.58E-01	1.84E-02	3.38E-04	7.40E-04	1.07E-03	1.48E-03	3.24E-03	4.71E-03
1,1,2,3,4,4-Hexachloro-1,3-butadiene (Hexachlorobutadiene)	260.76	2.61E-03	7.31E-05	2.08E-06	4.56E-06	6.62E-06	9.13E-06	2.00E-05	2.90E-05
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	187.37	4.99E-02	1.40E-03	2.86E-05	6.26E-05	9.10E-05	1.25E-04	2.74E-04	3.98E-04
1,1,2-Trichloroethane	133.4	1.76E-01	4.94E-03	7.21E-05	1.58E-04	2.29E-04	3.16E-04	6.90E-04	1.00E-03
1,1-Dichloroethane	98.96	1.79E+00	5.02E-02	5.43E-04	1.19E-03	1.73E-03	2.38E-03	5.20E-03	7.56E-03
1,1-Dichloroethene (1,1-Dichloroethylene)	96.94	1.40E-01	3.93E-03	4.17E-05	9.12E-05	1.32E-04	1.83E-04	3.99E-04	5.80E-04
1,2,3-Trimethylbenzene	120.19	8.97E-01	2.51E-02	3.30E-04	7.21E-04	1.05E-03	1.44E-03	3.16E-03	4.59E-03
1,2,4-Trichlorobenzene	181.45	5.29E-03	1.48E-04	2.94E-06	6.42E-06	9.33E-06	1.29E-05	2.81E-05	4.08E-05
1,2,4-Trimethylbenzene	120.19	2.10E+00	5.87E-02	7.71E-04	1.69E-03	2.45E-03	3.38E-03	7.39E-03	1.07E-02
1,2-Dibromoethane (Ethylene dibromide)	187.86	4.21E-03	1.18E-04	2.42E-06	5.30E-06	7.69E-06	1.06E-05	2.32E-05	3.37E-05
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	170.92	1.24E-01	3.47E-03	6.49E-05	1.42E-04	2.06E-04	2.84E-04	6.22E-04	9.03E-04
1,2-Dichloroethane (Ethylene dichloride)	98.96	2.30E-01	6.43E-03	6.96E-05	1.52E-04	2.21E-04	3.05E-04	6.67E-04	9.68E-04
1,2-Dichloroethene	96.94	1.11E+01	3.10E-01	3.28E-03	7.18E-03	1.04E-02	1.44E-02	3.14E-02	4.57E-02
1,2-Dichloropropane	112.99	3.86E-02	1.08E-03	1.33E-05	2.92E-05	4.24E-05	5.84E-05	1.28E-04	1.86E-04
1,2-Diethylbenzene	134.22	6.74E-02	1.89E-03	2.77E-05	6.05E-05	8.79E-05	1.21E-04	2.65E-04	3.85E-04
1,3,5-Trimethylbenzene	120.19	8.52E-01	2.38E-02	3.13E-04	6.85E-04	9.95E-04	1.37E-03	3.00E-03	4.36E-03
1,3-Butadiene (Vinyl ethylene)	54.09	1.73E-01	4.85E-03	2.87E-05	6.27E-05	9.11E-05	1.26E-04	2.75E-04	3.99E-04
1,3-Diethylbenzene	134.22	1.18E-01	3.30E-03	4.84E-05	1.06E-04	1.54E-04	2.12E-04	4.64E-04	6.74E-04
1,4-Dichlorobutane	127.01	3.84E-02	1.07E-03	1.49E-05	3.26E-05	4.74E-05	6.53E-05	1.43E-04	2.07E-04
1,4-Diethylbenzene	134.22	4.93E-01	1.38E-02	2.03E-04	4.43E-04	6.43E-04	8.87E-04	1.94E-03	2.82E-03
1,4-Dioxane (1,4-Diethylene dioxide)	88.11	7.81E-03	2.19E-04	2.11E-06	4.60E-06	6.69E-06	9.22E-06	2.02E-05	2.93E-05
1-Butene	56.11	6.05E-01	1.69E-02	1.04E-04	2.27E-04	3.30E-04	4.55E-04	9.95E-04	1.45E-03
2-Methylbutene	70.13	6.05E-01	1.69E-02	1.30E-04	2.84E-04	4.12E-04	5.69E-04	1.24E-03	1.81E-03
1-Butene / 2-Methylpropene	56.11	1.18E+00	3.30E-02	2.02E-04	4.42E-04	6.42E-04	8.86E-04	1.94E-03	2.81E-03
1-Ethyl-4-methylbenzene (4-Ethyl toluene)	120.19	9.04E-01	2.53E-02	3.33E-04	7.27E-04	1.06E-03	1.46E-03	3.19E-03	4.63E-03
1-Ethyl-4-methylbenzene (4-Ethyl toluene) + 1,3,5-Trimethylbenzene	120.19	5.84E-01	1.63E-02	2.15E-04	4.70E-04	6.82E-04	9.41E-04	2.06E-03	2.99E-03
1-Heptene	98.19	6.12E-01	1.71E-02	1.84E-04	4.03E-04	5.85E-04	8.06E-04	1.76E-03	2.56E-03
1-Hexene / 2-Methyl-1-pentene	84.16	8.78E-02	2.46E-03	2.26E-05	4.95E-05	7.19E-05	9.91E-05	2.17E-04	3.15E-04
1-Methylcyclohexene	96.17	3.42E-02	9.57E-04	1.01E-05	2.20E-05	3.20E-05	4.41E-05	9.64E-05	1.40E-04
1-Methylcyclopentene	82.14	2.87E-02	8.05E-04	7.23E-06	1.58E-05	2.29E-05	3.16E-05	6.92E-05	1.01E-04
1-Nonene	126.24	1.89E-01	5.30E-03	7.31E-05	1.60E-04	2.32E-04	3.20E-04	7.00E-04	1.02E-03
1-Octene	112.21	2.74E+00	7.68E-02	9.43E-04	2.06E-03	2.99E-03	4.13E-03	9.03E-03	1.31E-02
1-Pentene	70.13	2.09E-01	5.86E-03	4.49E-05	9.82E-05	1.43E-04	1.97E-04	4.30E-04	6.25E-04
1-Propanethiol (n-Propyl mercaptan)	76.16	1.16E-01	3.26E-03	2.72E-05	5.94E-05	8.63E-05	1.19E-04	2.60E-04	3.78E-04
2,2,3-Trimethylbutane	100.20	9.92E-03	2.78E-04	3.04E-06	6.66E-06	9.67E-06	1.33E-05	2.92E-05	4.23E-05
2,2,4-Trimethylpentane	114.23	4.54E-01	1.27E-02	1.59E-04	3.48E-04	5.05E-04	6.96E-04	1.52E-03	2.21E-03
2,2,5-Trimethylhexane	128.26	1.56E-01	4.36E-03	6.12E-05	1.34E-04	1.94E-04	2.68E-04	5.86E-04	8.51E-04
2,2-Dimethylbutane	86.18	1.41E-01	3.93E-03	3.71E-05	8.11E-05	1.18E-04	1.62E-04	3.55E-04	5.16E-04
2,2-Dimethylhexane	114.23	1.32E-01	3.70E-03	4.62E-05	1.01E-04	1.47E-04	2.02E-04	4.42E-04	6.42E-04
2,2-Dimethylpentane	100.20	6.89E-02	1.93E-03	2.11E-05	4.62E-05	6.72E-05	9.26E-05	2.03E-04	2.94E-04
2,2-Dimethylpropane	72.15	1.71E-02	4.78E-04	3.77E-06	8.25E-06	1.20E-05	1.65E-05	3.61E-05	5.25E-05
2,3,4-Trimethylpentane	114.23	2.40E-01	6.73E-03	8.40E-05	1.84E-04	2.67E-04	3.68E-04	8.05E-04	1.17E-03
2,3-Dimethylbutane	86.18	1.73E-01	4.84E-03	4.56E-05	9.98E-05	1.45E-04	2.00E-04	4.37E-04	6.35E-04
2,3-Dimethylpentane	100.20	2.37E-01	6.64E-03	7.27E-05	1.59E-04	2.31E-04	3.18E-04	6.96E-04	1.01E-03
2,4-Dimethylhexane	114.23	4.30E-01	1.20E-02	1.50E-04	3.29E-04	4.77E-04	6.58E-04	1.44E-03	2.09E-03
2,4-Dimethylpentane	100.20	1.24E-01	3.48E-03	3.81E-05	8.33E-05	1.21E-04	1.67E-04	3.65E-04	5.30E-04
2,5-Dimethylhexane	114.23	3.30E-01	9.25E-03	1.16E-04	2.53E-04	3.67E-04	5.06E-04	1.11E-03	1.61E-03
2,5-Dimethylthiophene	112.19	6.42E-02	1.80E-03	2.20E-05	4.82E-05	7.00E-05	9.66E-05	2.11E-04	3.07E-04
2-Butanone (Methyl ethyl ketone)	72.11	4.07E+00	1.14E-01	8.98E-04	1.96E-03	2.85E-03	3.93E-03	8.60E-03	1.25E-02
2-Ethyl-1-butene	84.16	3.45E-02	9.66E-04	8.89E-06	1.94E-05	2.82E-05	3.89E-05	8.51E-05	1.24E-04
2-Ethylthiophene	112.19	6.27E-02	1.76E-03	2.15E-05	4.71E-05	6.84E-05	9.43E-05	2.06E-04	3.00E-04
2-Ethyltoluene	120.19	6.31E-01	1.77E-02	2.32E-04	5.08E-04	7.38E-04	1.02E-03	2.22E-03	3.23E-03
2-Hexanone (Methyl butyl ketone)	100.16	4.99E-01	1.40E-02	1.53E-04	3.34E-04	4.86E-04	6.70E-04	1.46E-03	2.13E-03
2-Methyl-1-butene	70.13	1.96E-01	5.50E-03	4.22E-05	9.22E-05	1.34E-04	1.85E-04	4.04E-04	5.86E-04
2-Methyl-1-propanethiol (Isobutyl mercaptan)	90.19	1.70E-01	4.76E-03	4.69E-05	1.03E-04	1.49E-04	2.06E-04	4.50E-04	6.53E-04
2-Methyl-2-butene	70.13	2.71E-01	7.60E-03	5.83E-05	1.27E-04	1.85E-04	2.55E-04	5.58E-04	8.10E-04
2-Methyl-2-propanethiol (tert-Butylmercaptan)	90.19	3.24E-01	9.07E-03	8.94E-05	1.96E-04	2.84E-04	3.92E-04	8.56E-04	1.24E-03
2-Methylbutane	72.15	1.13E+00	3.17E-02	2.50E-04	5.46E-04	7.93E-04	1.09E-03	2.39E-03	3.47E-03
2-Methylheptane	114.23	2.17E+00	6.09E-02	7.60E-04	1.66E-03	2.41E-03	3.33E-03	7.28E-03	1.06E-02
2-Methylhexane	100.20	8.39E-01	2.35E-02	2.57E-04	5.63E-04	8.17E-04	1.13E-03	2.47E-03	3.58E-03
2-Methylpentane	86.18	8.49E-01	2.38E-02	2.24E-04	4.90E-04	7.11E-04	9.81E-04	2.14E-03	3.11E-03
2-Propanol (Isopropyl alcohol)	60.1	1.92E+00	5.39E-02	3.54E-04	7.74E-04	1.12E-03	1.55E-03	3.39E-03	4.92E-03

Table H-1
San Jose Water Pollution Control Plant
Maximum Toxic Air Contaminant Emission Rates[1]

Engine Toxic Air Contaminant[1]	Molecular Weight[1]	Concentration		Maximum Hourly Emission Rate			Maximum Annual Emission Rate[7]		
		ppmv		lbs/hr			tons/year		
	lbs/lb-mole	Biogas[2]	WPCP Engine Exhaust[3]	P&E Bldg Engines, one[4]	Secondary Blower Bldg Engines, one[5]	Bldg 40 Engine, one[6]	P&E Bldg Engines, one	Secondary Blower Bldg Engines, one	Bldg 40 Engine, one
3,6-Dimethyloctane	142.28	7.17E-01	2.01E-02	3.12E-04	6.83E-04	9.92E-04	1.37E-03	2.99E-03	4.35E-03
3-Ethyltoluene	120.19	1.35E+00	3.79E-02	4.99E-04	1.09E-03	1.58E-03	2.18E-03	4.78E-03	6.93E-03
3-Methyl-1-butene	70.14	6.30E-02	1.77E-03	1.35E-05	2.96E-05	4.30E-05	5.93E-05	1.30E-04	1.88E-04
3-Methyl-1-pentene	84.16	6.78E-03	1.90E-04	1.75E-06	3.82E-06	5.55E-06	7.65E-06	1.67E-05	2.43E-05
3-Methylheptane	114.23	2.50E+00	6.99E-02	8.73E-04	1.91E-03	2.77E-03	3.82E-03	8.36E-03	1.21E-02
3-Methylhexane	100.20	1.56E+00	4.38E-02	4.80E-04	1.05E-03	1.52E-03	2.10E-03	4.59E-03	6.67E-03
3-Methylpentane	86.18	9.34E-01	2.62E-02	2.47E-04	5.39E-04	7.83E-04	1.08E-03	2.36E-03	3.43E-03
3-Methylthiophene	98.17	9.23E-02	2.58E-03	2.77E-05	6.07E-05	8.81E-05	1.21E-04	2.66E-04	3.86E-04
4-Methyl-1-pentene	84.16	2.33E-02	6.52E-04	6.00E-06	1.31E-05	1.91E-05	2.63E-05	5.75E-05	8.35E-05
4-Methyl-2-pentanone (MIBK)	100.16	8.40E-01	2.35E-02	2.58E-04	5.63E-04	8.18E-04	1.13E-03	2.47E-03	3.58E-03
4-Methylheptane	114.23	8.03E-01	2.25E-02	2.81E-04	6.14E-04	8.91E-04	1.23E-03	2.69E-03	3.90E-03
Acetaldehyde	44.05	8.29E-02	2.32E-03	1.12E-05	2.45E-05	3.55E-05	4.90E-05	1.07E-04	1.56E-04
Acetone	58.08	6.82E+00	1.91E-01	1.21E-03	2.65E-03	3.85E-03	5.31E-03	1.16E-02	1.69E-02
Acetonitrile	41.05	5.32E-01	1.49E-02	6.68E-05	1.46E-04	2.12E-04	2.93E-04	6.40E-04	9.29E-04
Benzene	78.11	2.17E+00	6.07E-02	5.18E-04	1.13E-03	1.65E-03	2.27E-03	4.97E-03	7.21E-03
Benzyl chloride	126.58	1.76E-02	4.93E-04	6.82E-06	1.49E-05	2.17E-05	2.99E-05	6.53E-05	9.48E-05
Bromodichloromethane	163.83	6.80E-02	1.91E-03	3.41E-05	7.46E-05	1.08E-04	1.49E-04	3.27E-04	4.75E-04
Bromomethane (Methyl bromide)	94.94	1.80E-02	5.04E-04	5.23E-06	1.14E-05	1.66E-05	2.29E-05	5.01E-05	7.28E-05
Butane	58.12	4.26E+00	1.19E-01	7.57E-04	1.66E-03	2.41E-03	3.32E-03	7.25E-03	1.05E-02
Carbon disulfide	76.14	1.40E-01	3.93E-03	3.27E-05	7.15E-05	1.04E-04	1.43E-04	3.13E-04	4.55E-04
Carbon tetrachloride	153.82	7.62E-03	2.13E-04	3.59E-06	7.85E-06	1.14E-05	1.57E-05	3.44E-05	4.99E-05
Carbon tetrafluoride (Freon 14)	88.00	1.49E-01	4.18E-03	4.02E-05	8.80E-05	1.28E-04	1.76E-04	3.86E-04	5.60E-04
Carbonyl sulfide (Carbon oxysulfide)	60.08	1.21E-01	3.39E-03	2.23E-05	4.87E-05	7.07E-05	9.75E-05	2.13E-04	3.10E-04
Chlorobenzene	112.56	5.52E-01	1.55E-02	1.90E-04	4.16E-04	6.04E-04	8.33E-04	1.82E-03	2.65E-03
Chlorodifluoromethane (Freon 22)	86.47	6.17E-01	1.73E-02	1.63E-04	3.57E-04	5.19E-04	7.16E-04	1.57E-03	2.27E-03
Chloroethane (Ethyl chloride)	64.51	2.51E+00	7.03E-02	4.96E-04	1.08E-03	1.58E-03	2.17E-03	4.75E-03	6.90E-03
Chloromethane (Methyl chloride)	50.49	2.17E-01	6.08E-03	3.36E-05	7.34E-05	1.07E-04	1.47E-04	3.22E-04	4.67E-04
cis-1,2-Dichloroethene	96.94	1.24E+00	3.47E-02	3.68E-04	8.04E-04	1.17E-03	1.61E-03	3.52E-03	5.11E-03
cis-1,2-Dimethylcyclohexane	112.21	3.23E-01	9.03E-03	1.11E-04	2.42E-04	3.52E-04	4.85E-04	1.06E-03	1.54E-03
cis-1,3-Dichloropropene	110.97	1.22E-02	3.41E-04	4.14E-06	9.05E-06	1.31E-05	1.81E-05	3.96E-05	5.76E-05
cis-1,3-Dichloropropene / trans-1,3-Dichloropropene	110.97	8.48E-03	2.38E-04	2.88E-06	6.30E-06	9.15E-06	1.26E-05	2.76E-05	4.01E-05
cis-1,3-Dimethylcyclohexane	112.21	1.89E+00	5.28E-02	6.48E-04	1.42E-03	2.06E-03	2.84E-03	6.21E-03	9.01E-03
cis-1,4-Dimethylcyclohexane / trans-1,3-Dimethylcyclohexane	112.21	9.67E-01	2.71E-02	3.32E-04	7.26E-04	1.05E-03	1.45E-03	3.18E-03	4.62E-03
cis-2-Butene	56.11	1.25E-01	3.51E-03	2.15E-05	4.71E-05	6.83E-05	9.42E-05	2.06E-04	2.99E-04
cis-2-Heptene	98.19	4.70E-02	1.32E-03	1.41E-05	3.09E-05	4.49E-05	6.19E-05	1.35E-04	1.96E-04
cis-2-Hexene	84.16	1.63E-02	4.56E-04	4.20E-06	9.18E-06	1.33E-05	1.84E-05	4.02E-05	5.84E-05
cis-2-Octene	112.21	1.50E-01	4.19E-03	5.14E-05	1.12E-04	1.63E-04	2.25E-04	4.93E-04	7.15E-04
cis-2-Pentene	70.13	3.69E-02	1.03E-03	7.93E-06	1.73E-05	2.52E-05	3.47E-05	7.59E-05	1.10E-04
cis-3-Heptene	98.19	1.41E-02	3.94E-04	4.23E-06	9.24E-06	1.34E-05	1.85E-05	4.05E-05	5.88E-05
cis-3-Methyl-2-pentene	84.16	2.96E-02	8.28E-04	7.62E-06	1.67E-05	2.42E-05	3.34E-05	7.30E-05	1.06E-04
cis-4-Methyl-2-pentene	84.16	3.92E-02	1.10E-03	1.01E-05	2.21E-05	3.21E-05	4.42E-05	9.67E-05	1.40E-04
CO	28.01	2.09E+01	5.86E-01	1.79E-03	3.92E-03	5.70E-03	7.85E-03	1.72E-02	2.49E-02
Cyclohexane	84.16	1.12E+00	3.14E-02	2.89E-04	6.32E-04	9.18E-04	1.27E-03	2.77E-03	4.02E-03
Cyclohexene	82.14	1.91E-02	5.36E-04	4.81E-06	1.05E-05	1.53E-05	2.11E-05	4.61E-05	6.70E-05
Cyclopentane	70.13	7.18E-02	2.01E-03	1.54E-05	3.37E-05	4.90E-05	6.75E-05	1.48E-04	2.14E-04
Cyclopentene	69.12	9.40E-03	2.63E-04	1.99E-06	4.35E-06	6.32E-06	8.71E-06	1.91E-05	2.77E-05
Decane	142.28	4.47E+00	1.25E-01	1.95E-03	4.26E-03	6.19E-03	8.53E-03	1.87E-02	2.71E-02
Dibromochloromethane	208.28	1.35E-02	3.77E-04	8.58E-06	1.88E-05	2.72E-05	3.76E-05	8.22E-05	1.19E-04
Dibromomethane (Methylene dibromide)	173.84	8.35E-04	2.34E-05	4.44E-07	9.72E-07	1.41E-06	1.95E-06	4.26E-06	6.18E-06
Dichlorobenzene	147	7.76E-01	2.17E-02	3.49E-04	7.64E-04	1.11E-03	1.53E-03	3.35E-03	4.86E-03
Dichlorodifluoromethane (Freon 12)	120.91	1.04E+00	2.90E-02	3.84E-04	8.39E-04	1.22E-03	1.68E-03	3.67E-03	5.34E-03
Dichlorofluoromethane (Freon 21)	102.92	1.57E-02	4.38E-04	4.93E-06	1.08E-05	1.57E-05	2.16E-05	4.72E-05	6.86E-05
Dichloromethane (Methylene chloride)	84.93	5.15E+00	1.44E-01	1.34E-03	2.93E-03	4.26E-03	5.87E-03	1.28E-02	1.86E-02
Diethyl sulfide	90.19	8.60E-02	2.41E-03	2.37E-05	5.19E-05	7.54E-05	1.04E-04	2.27E-04	3.30E-04
Dimethyl disulfide	94.20	1.29E-01	3.62E-03	3.73E-05	8.15E-05	1.18E-04	1.63E-04	3.57E-04	5.18E-04
Dimethyl sulfide	62.14	5.55E+00	1.55E-01	1.06E-03	2.31E-03	3.35E-03	4.63E-03	1.01E-02	1.47E-02
Dodecane (n-Dodecane)	170.33	2.58E-01	7.23E-03	1.35E-04	2.95E-04	4.28E-04	5.90E-04	1.29E-03	1.87E-03
Ethane	30.07	8.85E+00	2.48E-01	8.15E-04	1.78E-03	2.59E-03	3.57E-03	7.81E-03	1.13E-02
Ethanol	46.07	2.22E-01	6.23E-03	3.14E-05	6.86E-05	9.96E-05	1.37E-04	3.00E-04	4.36E-04
Ethyl acetate	88.11	1.81E+00	5.06E-02	4.88E-04	1.07E-03	1.55E-03	2.14E-03	4.67E-03	6.78E-03
Ethyl mercaptan (Ethanediol)	62.14	1.89E-01	5.28E-03	3.59E-05	7.84E-05	1.14E-04	1.57E-04	3.43E-04	4.99E-04
Ethyl methyl sulfide	76.16	3.66E-02	1.02E-03	8.53E-06	1.87E-05	2.71E-05	3.74E-05	8.17E-05	1.19E-04
Ethylbenzene	106.17	7.60E+00	2.13E-01	2.47E-03	5.40E-03	7.85E-03	1.08E-02	2.37E-02	3.44E-02
Formaldehyde	30.03	1.23E-02	3.44E-04	1.13E-06	2.47E-06	3.59E-06	4.95E-06	1.08E-05	1.57E-05
Heptane	100.20	2.00E+00	5.61E-02	6.14E-04	1.34E-03	1.95E-03	2.69E-03	5.89E-03	8.55E-03
Hexane	86.18	3.01E+00	8.43E-02	7.95E-04	1.74E-03	2.52E-03	3.48E-03	7.61E-03	1.11E-02
Hexylbenzene	162.27	6.18E-04	1.73E-05	3.07E-07	6.71E-07	9.75E-07	1.34E-06	2.94E-06	4.27E-06
Hydrogen chloride	**36.46**	3.50E+00	9.80E-02	3.91E-04	8.54E-04	1.24E-03	1.71E-03	3.74E-03	5.43E-03

Table H-1
San Jose Water Pollution Control Plant
Maximum Toxic Air Contaminant Emission Rates[1]

Engine Toxic Air Contaminant[1]	Molecular Weight[1]	Concentration		Maximum Hourly Emission Rate			Maximum Annual Emission Rate[7]		
		ppmv		lbs/hr			tons/year		
	lbs/lb-mole	Biogas[2]	WPCP Engine Exhaust[3]	P&E Bldg Engines, one[4]	Secondary Blower Bldg Engines, one[5]	Bldg 40 Engine, one[6]	P&E Bldg Engines, one	Secondary Blower Bldg Engines, one	Bldg 40 Engine, one
Hydrogen sulfide	34.08	3.04E+01	8.52E-01	3.17E-03	6.94E-03	1.01E-02	1.39E-02	3.04E-02	4.41E-02
Indane (2,3-Dihydroindene)	34.08	1.31E-01	3.67E-03	1.37E-05	2.99E-05	4.34E-05	5.99E-05	1.31E-04	1.90E-04
Isobutane (2-Methylpropane)	58.12	6.20E+00	1.74E-01	1.10E-03	2.41E-03	3.51E-03	4.83E-03	1.06E-02	1.54E-02
Isobutylbenzene	134.22	7.03E-02	1.97E-03	2.89E-05	6.32E-05	9.17E-05	1.26E-04	2.77E-04	4.02E-04
Isoprene (2-Methyl-1,3-butadiene)	68.12	4.43E-02	1.24E-03	9.24E-06	2.02E-05	2.93E-05	4.05E-05	8.85E-05	1.28E-04
Isopropyl mercaptan	76.16	1.68E-01	4.70E-03	3.91E-05	8.55E-05	1.24E-04	1.71E-04	3.75E-04	5.44E-04
Isopropylbenzene (Cumene)	120.19	7.90E-01	2.21E-02	2.91E-04	6.36E-04	9.23E-04	1.27E-03	2.79E-03	4.04E-03
Methanethiol (Methyl mercaptan)	48.11	1.34E+00	3.75E-02	1.97E-04	4.31E-04	6.26E-04	8.64E-04	1.89E-03	2.74E-03
Methyl tert-butyl ether (MTBE)	88.15	1.06E-01	2.97E-03	2.86E-05	6.25E-05	9.08E-05	1.25E-04	2.74E-04	3.98E-04
Methylcyclohexane	98.19	2.84E+00	7.96E-02	8.54E-04	1.87E-03	2.71E-03	3.74E-03	8.18E-03	1.19E-02
Methylcyclopentane	84.16	9.34E-01	2.61E-02	2.41E-04	5.26E-04	7.64E-04	1.05E-03	2.30E-03	3.35E-03
Naphthalene	128.17	1.77E-01	4.95E-03	6.93E-05	1.52E-04	2.20E-04	3.04E-04	6.64E-04	9.64E-04
n-Butylbenzene	134.22	1.29E-01	3.60E-03	5.29E-05	1.16E-04	1.68E-04	2.32E-04	5.06E-04	7.35E-04
Nonane	128.26	6.58E+00	1.84E-01	2.59E-03	5.65E-03	8.21E-03	1.13E-02	2.48E-02	3.60E-02
n-Propylbenzene (Propylbenzene)	120.19	6.06E-01	1.70E-02	2.23E-04	4.88E-04	7.09E-04	9.77E-04	2.14E-03	3.10E-03
Octane	114.23	4.69E+00	1.31E-01	1.64E-03	3.58E-03	5.20E-03	7.18E-03	1.57E-02	2.28E-02
p-Cymene (1-Methyl-4-Isopropylbenzene)	134.22	3.38E+00	9.47E-02	1.39E-03	3.04E-03	4.41E-03	6.09E-03	1.33E-02	1.93E-02
Pentane	72.15	3.21E+00	9.00E-02	7.10E-04	1.55E-03	2.25E-03	3.11E-03	6.80E-03	9.87E-03
Propane	44.10	1.21E+01	3.38E-01	1.63E-03	3.57E-03	5.18E-03	7.14E-03	1.56E-02	2.27E-02
Propene (propylene)	42.08	2.88E+00	8.06E-02	3.71E-04	8.11E-04	1.18E-03	1.62E-03	3.55E-03	5.16E-03
Propyne	40.06	3.98E-02	1.11E-03	4.88E-06	1.07E-05	1.55E-05	2.14E-05	4.67E-05	6.78E-05
sec-Butylbenzene	134.22	1.20E-01	3.36E-03	4.92E-05	1.08E-04	1.56E-04	2.16E-04	4.72E-04	6.85E-04
Styrene (Vinylbenzene)	104.15	3.21E-01	9.00E-03	1.02E-04	2.24E-04	3.25E-04	4.49E-04	9.82E-04	1.43E-03
tert-Butylbenzene	134.22	2.40E-02	6.73E-04	9.87E-06	2.16E-05	3.14E-05	4.32E-05	9.46E-05	1.37E-04
Tetrachloroethylene (Perchloroethylene)	165.83	1.78E+00	4.99E-02	9.05E-04	1.98E-03	2.87E-03	3.96E-03	8.67E-03	1.26E-02
Tetrahydrofuran (Diethylene oxide)	72.11	9.51E-01	2.66E-02	2.10E-04	4.59E-04	6.67E-04	9.20E-04	2.01E-03	2.92E-03
Thiophene	84.14	3.48E-01	9.73E-03	8.95E-05	1.96E-04	2.84E-04	3.92E-04	8.57E-04	1.25E-03
Toluene (Methyl benzene)	92.14	3.02E+01	8.47E-01	8.53E-03	1.86E-02	2.71E-02	3.74E-02	8.17E-02	1.19E-01
trans-1,2-Dichloroethene	96.94	3.67E-02	1.03E-03	1.09E-05	2.38E-05	3.46E-05	4.77E-05	1.04E-04	1.52E-04
trans-1,2-Dimethylcyclohexane	112.21	1.25E+00	3.50E-02	4.29E-04	9.38E-04	1.36E-03	1.88E-03	4.11E-03	5.97E-03
trans-1,3-Dichloropropene	110.97	9.88E-03	2.77E-04	3.36E-06	7.34E-06	1.07E-05	1.47E-05	3.21E-05	4.67E-05
trans-1,4-Dimethylcyclohexane	112.21	8.45E-01	2.37E-02	2.90E-04	6.35E-04	9.22E-04	1.27E-03	2.78E-03	4.04E-03
trans-2-Butene	56.11	1.25E-01	3.50E-03	2.15E-05	4.70E-05	6.82E-05	9.41E-05	2.06E-04	2.99E-04
trans-2-Heptene	98.19	9.82E-03	2.75E-04	2.95E-06	6.46E-06	9.38E-06	1.29E-05	2.83E-05	4.11E-05
trans-2-Hexene	84.16	2.20E-02	6.16E-04	5.67E-06	1.24E-05	1.80E-05	2.48E-05	5.43E-05	7.89E-05
trans-2-Octene	112.21	2.74E+00	7.67E-02	9.41E-04	2.06E-03	2.99E-03	4.12E-03	9.01E-03	1.31E-02
trans-2-Pentene	70.13	3.18E-02	8.90E-04	6.82E-06	1.49E-05	2.17E-05	2.99E-05	6.53E-05	9.49E-05
trans-3-Heptene	98.19	8.06E-02	2.26E-03	2.42E-05	5.30E-05	7.70E-05	1.06E-04	2.32E-04	3.37E-04
trans-3-Methyl-2-pentene	84.16	2.26E-02	6.32E-04	5.82E-06	1.27E-05	1.85E-05	2.55E-05	5.57E-05	8.09E-05
Tribromomethane (Bromoform)	252.73	1.29E-02	3.61E-04	9.99E-06	2.18E-05	3.17E-05	4.37E-05	9.56E-05	1.39E-04
Trichloroethylene (Trichloroethene)	131.39	7.55E-01	2.11E-02	3.04E-04	6.64E-04	9.64E-04	1.33E-03	2.91E-03	4.22E-03
Trichlorofluoromethane (Freon 11)	137.37	2.14E-01	5.98E-03	8.99E-05	1.97E-04	2.85E-04	3.94E-04	8.61E-04	1.25E-03
Trichloromethane (Chloroform)	119.38	6.67E-02	1.87E-03	2.44E-05	5.33E-05	7.74E-05	1.07E-04	2.34E-04	3.39E-04
Undecane	156.31	1.76E+00	4.92E-02	8.41E-04	1.84E-03	2.67E-03	3.68E-03	8.05E-03	1.17E-02
Vinyl acetate	86.09	1.92E-01	5.38E-03	5.06E-05	1.11E-04	1.61E-04	2.22E-04	4.85E-04	7.04E-04
Vinyl chloride (Chloroethene)	62.5	1.23E+00	3.46E-02	2.36E-04	5.16E-04	7.50E-04	1.03E-03	2.26E-03	3.29E-03
Xylenes (o-, m-, p-, mixtures)	106.17	1.06E+01	2.98E-01	3.46E-03	7.56E-03	1.10E-02	1.51E-02	3.31E-02	4.81E-02
TAC Subtotals:	-			6.54E-02	1.43E-01	2.08E-01	2.86E-01	6.26E-01	9.09E-01
NMOC (as hexane)	86.18	8.38E+02	2.35E+01	2.21E-01	4.83E-01	7.02E-01	9.68E-01	2.12E+00	3.08E+00
VOC (as hexane)	86.18	8.35E+02	2.34E+01	2.20E-01	4.82E-01	7.00E-01	9.65E-01	2.11E+00	3.06E+00
Totals	-	-	-	6.54E-02	1.43E-01	2.08E-01	2.86E-01	6.26E-01	9.09E-01

(1) USEPA. *Compilation of Air Pollutant Emission Factors, Volume 1 - Stationary Point and Area Sources,* Chapter 2 - Solid Waste Disposal, Draft Section 2.4 - Municipal Solid Waste Landfills, Table 2.4-1 - Default Concentrations for LFG Constituents for Landfills with Waste in Place on or After 1992, October 2008

(2) Ibid, Mean concentrations (ppmv) in Appendix C - Landfill Gas Constituents (Uncorrected Concentrations), October 2008, as recommended by Carol Allen (BAAQMD) in telephone conversation with Eric Walther at Sierra Research on May 3, 2010.

(3) Ibid, Table 2.4-3 - Control Efficiencies for LFG NMOC and VOC, gives IC engine control efficiency (%) = 97.2%

(4) Based on P&E Bldg engine exhaust flow (scfm) = 705

(5) Based on a Secondary Blower Bldg exhaust flow (scfm) = 1,542

(6) Based on a Bldg 40 exhaust flow (scfm) = 2,240

(7) Maximum possible operation (hours/year) = 8,760

Table H-2
Diesel-Fueled Engine Performance and Emissions
Zanker Road Materials Processing Facility

Engine	**Units**	**Value**	**Parameters for Modeling**
Manufacturer		Caterpillar	
Model		C32 ATAAC	
Electrical Rating	ekW	**596**	
Brake Horsepower	Bhp	**800**	
Speed	rpm		
Fuel		CARB Diesel	
Specific Gravity		0.95	
Fuel Sulfur Content	ppmw	15	
Fuel Consumption	gph	72.0	21,747 gal/year
Exhaust Flow	acfm	8,129	3.837 m^3/s
	scfm	3184	At BAAQMD std T = 70°F
Exhaust Temperature	deg. F	893.3	751.50 deg K
Exhaust Pipe Diameter	in	8	0.2032 m
Exhaust Velocity	fps	388.2	118.31 m/s
Exhaust Stack Height	ft	30	9.144 m
Operating Profile	**Units**	**Value**	**Notes**
Daily Operation	hrs/day	12	
Annual Operation	hrs/year	**2,087**	
Emissions	**Units**	**Value**	**Notes**
SOx (as SO_2)	g/bhp-hr	0.1043	
NOx	g/bhp-hr	**1.5**	**13.3 tpy**
CO	g/bhp-hr	**2.75**	
POC	g/bhp-hr	**1.50**	
$PM_{10}/PM_{2.5}$	g/bhp-hr	**0.06**	Has catalytic DPF
$PM_{10}/PM_{2.5}$	gr/scf	0.0465	
NOx	lb/hr	31.75	Note: These emissions occur only over the 1/2 hour of each weekly test.
CO	lb/hr	58.20	
POC	lb/hr	31.749	
$PM_{10}/PM_{2.5}$	lb/hr	1.270	
SOx (as SO_2)	lb/hr	0.1840	
CO_2 (2)	lb/hr	19,311	
CH_4 (3)	lb/hr	0.793	
N_2O (4)	lb/hr	0.1585	

1) California ATCM and EPA Tier 2 emission limit compliant
Energy content of Diesel fuel (Btu/lb) = 19,596
Energy content of Diesel fuel (Btu/gal) 138,691
U.S. EIA. *Energy Calculators*, http://www.eia.doe.gov/kids/energy.cfm?page=about_ener

2) CH_4 emission factor (kg/MMBtu) = 0.003 = in lbs/MMBtu 0.0066
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) CO_2 emission factor (kg/MMBtu) = 73.10 = in lbs/MMBtu 160.8
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

4) N_20 emission factor (kg/MMBtu) = 0.0006 = in lbs/MMBtu 0.00132
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

Table H-3
Diesel-Fueled Tub Grinder Engine Performance and Emissions
Zanker Road Materials Processing Facility

Engine	**Units**	**Value**	**Parameters for Modeling**
Manufacturer		Caterpillar	
Model		C32 ATAAC	
Electrical Rating	ekW	**559**	
Brake Horsepower	Bhp	**750**	
Speed	rpm		
Fuel		CARB Diesel	
Specific Gravity		0.95	
Fuel Sulfur Content	ppmw	15	
Fuel Consumption	gph	72.0	**137,000 gal/year**
Exhaust Flow	acfm	8,129	3.837 m^3/s
	scfm	3184	At BAAQMD std T = 70°F
Exhaust Temperature	deg. F	893.3	751.50 deg K
Exhaust Pipe Diameter	in	8	0.2032 m
Exhaust Velocity	fps	388.2	118.31 m/s
Exhaust Stack Height	ft	30	9.144 m
Operating Profile	**Units**	**Value**	**Notes**
Daily Operation	hrs/day	12	
Annual Operation	hrs/year	4,368	
Emissions	**Units**	**Value**	**Notes**
SOx (as SO_2)	g/bhp-hr	0.1113	
NOx	g/bhp-hr	**6.6**	
CO	g/bhp-hr	**2.75**	
POC	g/bhp-hr	**1.50**	
$PM_{10}/PM_{2.5}$	g/bhp-hr	0.018	
$PM_{10}/PM_{2.5}$	gr/scf	0.0131	
NOx	lb/hr	130.95	**14.2 tpy**
CO	lb/hr	54.56	
POC	lb/hr	29.765	
$PM_{10}/PM_{2.5}$	lb/hr	0.357	
SOx (as SO_2)	lb/hr	0.1840	
CO_2 (2)	lb/hr	19,311	
CH_4 (3)	lb/hr	0.793	
N_2O (4)	lb/hr	0.1585	

1) California ATCM and EPA Tier 2 emission limit compliant
Energy content of Diesel fuel (Btu/lb) = 19,596
Energy content of Diesel fuel (Btu/gal) = 138,691
U.S. EIA. *Energy Calculators,* http://www.eia.doe.gov/kids/energy.cfm?page=about_energy

2) CH_4 emission factor (kg/MMBtu) = 0.003 = in lbs/MMBtu 0.0066
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) CO_2 emission factor (kg/MMBtu) = 73.10 = in lbs/MMBtu 160.8
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

4) N_20 emission factor (kg/MMBtu) = 0.0006 = in lbs/MMBtu 0.00132
ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

Table H-4
Source Emission Parameters
Water Pollution Control Plant

P&E Building

Height =	50	feet
Length =	175	feet
Width =	90	feet
Stack ht =	8	feet above roof
Stack Diam =	1	feet

	MMBtu/hr	PM2.5 lb/MMBtu	hr/yr	lb/yr	PM2.5 g/s	dscf/MMBtu	O2%	Exhaust Deg F	acfm	Velocity ft/sec
S4	9.1	0.015	8760	1,196	1.72E-02	9493	11.55	600	6,444	137
S5	9.1	0.015	8760	1,196	1.72E-02	9493	11.55	600	6,444	137
S6	9.1	0.015	8760	1,196	1.72E-02	9493	11.55	600	6,444	137

Draft AP-42 factor for **landfill gas** combustion in reciprocating engines (Table 2.4-4; 15 lb/MMscf CH4 = 0.015 lb

Secondary Blower Building

Height =	50	feet
Length =	230	feet
Width =	135	feet
Stack ht =	10	feet above roof
Stack Diam =	1.5	feet

	MMBtu/hr	PM2.5 lb/MMBtu	hr/yr	lb/yr	PM2.5 g/s	dscf/MMBtu	O2%	Exhaust Deg F	acfm	Velocity ft/sec
S9	19.9	0.015	8760	2,615	3.76E-02	9493	11.55	600	14,092	133
S10	19.9	0.015	8760	2,615	3.76E-02	9493	11.55	600	14,092	133
S11	19.9	0.015	8760	2,615	3.76E-02	9493	11.55	600	14,092	133

Draft AP-42 factor for **landfill gas** combustion in reciprocating engines (Table 2.4-4; 15 lb/MMscf CH4 = 0.015 lb

Building 40 Electrical Generation

Height =	50	feet
Length =	230	feet
Width =	85	feet
Stack ht =	60	feet (next to building)
Stack Diam =	2	feet

	MMBtu/hr	Bhp	PM2.5 g/bhp-hr	hr/yr	lb/yr	PM2.5 g/s	dscf/MMBtu	O2%	Exhaust Deg F	acfm	Velocity ft/sec
S54	28.9	3900	0.085	8760	6,402	9.21E-02	9493	11.55	600	20,465	109

Factor from BAAQMD permit limit

Table H-5
Diesel-Fueled Tub Grinder Engine Performance and Emissions
Zanker Landfill

Engine	**Units**	**Value**	**Parameters for Modeling**
Manufacturer		Caterpillar?	
Model			
Electrical Rating	ekW	559	
Brake Horsepower	Bhp	750	
Fuel		CARB Diesel	
Specific Gravity		0.95	
Fuel Sulfur Content	ppmw	15	
Fuel Consumption	gph	40.3	
Exhaust Flow	acfm	4,546	2.145 m^3/s
	scfm	1780	At BAAQMD std T = 70°F
Exhaust Temperature	deg. F	893.3	751.50 deg K
Exhaust Pipe Diameter	in	8	0.2032 m
Exhaust Velocity	fps	217.0	66.16 m/s
Exhaust Stack Height	ft	10	3.048 m
Operating Profile	**Units**	**Value**	**Notes**
Daily Operation	hrs/day	**8**	
Annual Operation	hrs/yr	2080	**5 dys/wk, 52 wks/yr**
Emissions	**Units**	**Value**	**Notes**
SOx (as SO_2)	g/bhp-hr	0.0052	
NOx	g/bhp-hr	4.93	
CO	g/bhp-hr	0.13	
POC	g/bhp-hr	0.01	
$PM_{10/}PM_{2.5}$	g/bhp-hr	0.23	Back calculated from permit limit bel
$PM_{10/}PM_{2.5}$	gr/scf	0.0253	
NOx	lb/hr	8.15	Permit limit, assuming 8 hrs/day operation.
CO	lb/hr	0.21	
POC	lb/hr	0.017	
$PM_{10/}PM_{2.5}$	lb/hr	0.386	
SOx (as SO_2)	lb/hr	0.0086	
CO_2 (2)	lb/hr	900	
CH_4 (3)	lb/hr	0.037	
N_2O (4)	lb/hr	0.0074	

1) California ATCM and EPA Tier 2 emission limit compliant
Energy content of Diesel fuel (Btu/lb) = 19,596
Energy content of Diesel fuel (Btu/gal) 138,691

U.S. EIA. *Energy Calculators,* http://www.eia.doe.gov/kids/energy.cfm?page=about_energy_cc

2) CH_4 emission factor (kg/MMBtu) = 0.003 = in lbs/MMBtu 0.0066

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

3) CO_2 emission factor (kg/MMBtu) = 73.10 = in lbs/MMBtu 160.8

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 4, page Appendix A-7, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

4) N_20 emission factor (kg/MMBtu) = 0.0006 = in lbs/MMBtu 0.00132

ARB. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions,* CCR Title 17, Subchapter 10, Article 2, Appendix A, Table 6, page Appendix A-9, December 2, 2008, http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf.

Table H-6
Criteria Pollutant Modeling Inputs for Zanker Landfill and Zanker Materials Processing Facility
Dry Fermentation Anaerobic Digestion Facility Project

Averaging Period, Criteria Pollutant and Emitting Unit	Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Emission Rate, g/s						Stack Dia	Exhaust Height, ft	Exhaust Temp, Deg F	Exhaust Flow Rate, ft^3/m	Exhaust Velocity, ft/s	Emission Rate, lbs/hr					
						NOx	SO_2	CO	Combustion $PM_{10}/PM_{2.5}$	Fugitive PM_{10}	Fugitive $PM_{2.5}$						NOx	SO_2	CO	Combustion $PM_{10}/PM_{2.5}$	Fugitive PM_{10}	Fugitive $PM_{2.5}$
Averaging Period: One hour for NO_2, SO_2, and CO in Normal Operation[4]																						
Zanker Landfill Tub Grinder Diesel Engine (S-24) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	1.027083	1.081E-03	2.708E-02	n/a	n/a	n/a	0.67	10 (9)	893.3 (10)	4546 (10)	217.05 (10)	8.15	8.58E-03 (10)	0.21	n/a	n/a	n/a
Zanker Landfill 99 hp Gypsum Screening Diesel Engine (S-28) 8 AM - 6 PM	0.102	3.05	751.7	0.28	34.93	0.000788	1.426E-04	7.875E-04	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	600 (10)	114.60 (10)	0.0063 (13)	1.13E-03 (14)	#########	n/a	n/a	n/a
Zanker Landfill 196 hp Demoliton Plant No. 1 Diesel Engine (S-31) 8 AM - 6 PM	0.102	3.05	751.7	0.56	69.16	0.000788	2.824E-04	7.875E-04	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	1188 (10)	226.89 (10)	0.0063 (13)	2.24E-03 (14)	0.0063 (13)	n/a	n/a	n/a
Zanker MPF Landfill surface (S-1)	344	1.52	294.3	0.00	0.30	0.000263	n/a	n/a	n/a	n/a	n/a	1,128	5	70		1	2.08E-03	n/a	n/a	n/a	4.17E-03	4.17E-03
Zanker MPF 750 hp Tub Grinder Diesel Engine (S-9) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	#VALUE!	1.081E-03	2.708E-02	n/a	n/a	n/a	0.67	10 (9)	893.3 (10)	4546 (10)	217.05 (10)	n/a	8.58E-03 (10)	0.21	n/a	n/a	n/a
Zanker MPF 800 hp Diesel Engine (S-12) 8 AM - 6 PM	0.203	3.05	751.7	2.29	70.57	0.070247	1.153E-03	6.239E-03	n/a	n/a	n/a	0.67	10 (9)	893.3 (10)	4849 (10)	231.52 (10)	0.56	9.15E-03 (10)	0.05	n/a	n/a	n/a
Averaging Period: Three hours for SO_2 in Normal Operation[4]																						
Zanker Landfill Tub Grinder Diesel Engine (S-24) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	n/a	0.001081	n/a	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	0.009	n/a	n/a	n/a	n/a
Zanker Landfill 99 hp Gypsum Screening Diesel Engine (S-28) 8 AM - 6 PM	0.102	3.05	751.7	0.28	34.93	n/a	1.426E-04	n/a	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	600 (10)	114.60 (10)	n/a	1.13E-03 (14)	n/a	n/a	n/a	n/a
Zanker Landfill 196 hp Demoliton Plant No. 1 Diesel Engine (S-31) 8 AM - 6 PM	0.102	3.05	751.7	0.56	69.16	n/a	2.824E-04	n/a	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	1188 (10)	226.89 (10)	n/a	2.24E-03 (14)	n/a	n/a	n/a	n/a
Zanker MPF 750 hp Tub Grinder Diesel Engine (S-9) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	n/a	1.081E-03	n/a	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	0.009	n/a	n/a	n/a	n/a
Zanker MPF 800 hp Diesel Engine (S-12) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	n/a	1.153E-03	n/a	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	0.009	n/a	n/a	n/a	n/a
Averaging Period: Eight hours for CO in Normal Operation[4]																						
Zanker Landfill Tub Grinder Diesel Engine (S-24) 8 AM - 6 PM	0.203	3.05	751.7	2.1	66.16	n/a	n/a	0.027	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	n/a	0.21	n/a	n/a	n/a
Zanker Landfill 99 hp Gypsum Screening Diesel Engine (S-28) 8 AM - 6 PM	0.102	3.05	751.7	0.28	34.93	n/a	n/a	7.875E-04	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	600 (10)	114.60 (10)	n/a	n/a	#########	n/a	n/a	n/a
Zanker Landfill 196 hp Demoliton Plant No. 1 Diesel Engine (S-31) 8 AM - 6 PM	0.102	3.05	751.7	0.56	69.16	n/a	n/a	7.875E-04	n/a	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	1188 (10)	226.89 (10)	n/a	n/a	0.0063 (13)	n/a	n/a	n/a
Zanker MPF 750 hp Tub Grinder Diesel Engine (S-9) 8 AM - 6 PM	0.203	3.05	751.7	2.1	66.16	n/a	n/a	0.027	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	n/a	0.21	n/a	n/a	n/a
Zanker MPF 800 hp Diesel Engine (S-12) 8 AM - 6 PM	0.203	3.05	751.7	2.1	66.16	n/a	n/a	0.006	n/a	n/a	n/a	0.67	10.0	893.3	4,546	217.05	n/a	n/a	0.05	n/a	n/a	n/a
Averaging Period: 24 hours for SO_2 and PM_{10} in Normal Operation[2,4]																						
Zanker Landfill Wood Waste Plant (S-1) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	5.20E-02	0.02899		6	70		1	n/a	n/a	n/a	n/a	0.413 (5)	0.230 (6)
Zanker Landfill Yard Waste Plant (S-3) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	4.00E-02	0.0223		6	70		1	n/a	n/a	n/a	n/a	0.317 (5)	0.177 (6)
Zanker Landfill Feeder, Grizzly Screen and Conveyors at Co (S-11) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.47E-02	0.00818		10	70		1	n/a	n/a	n/a	n/a	0.116 (5)	0.065 (6)
Zanker Landfill Jaw Crusher at Concrete Recycling Plant (S-12) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	9.64E-03	0.00179		10	70		1	n/a	n/a	n/a	n/a	0.077 (7)	0.014 (8)
Zanker Landfill 3 Deck Screening System at Concrete Recycling Plant (S-13) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.93E-02	0.00357		10	70		1	n/a	n/a	n/a	n/a	0.153 (7)	0.028 (8)
Zanker Landfill Secondary Impact Crusher at Concrete Recycling Plant (S-14) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	9.64E-03	0.00179		10	70		1	n/a	n/a	n/a	n/a	0.077 (7)	0.014 (8)
Zanker Landfill Stockpile, Incoming at Concrete Recycling Plant (S-16) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.30E-02	0.00242		10	70		1	n/a	n/a	n/a	n/a	0.104 (7)	0.019 (8)
Zanker Landfill Stockpile, Outgoing at Concrete Recycling Plant (S-17) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	7.37E-03	0.00137		10	70		1	n/a	n/a	n/a	n/a	0.059 (7)	0.011 (8)
Zanker Landfill Soil aeration/rototilling (S-18) 8 AM - 6 PM		1.52	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		5	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Soil aeration/rototilling (S-19) 8 AM - 6 PM		1.52	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		5	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Demolition Plant No. 1 (S-20) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.13E-02	0.01747		6	70		1	n/a	n/a	n/a	n/a	0.249 (5)	0.139 (6)
Zanker Landfill surface (S-21)	344	1.52	294.3	0.0	0.30	n/a	2.625E-04	n/a	n/a	5.25E-04	0.00053	1,128	5	70		1	n/a	0.0021	n/a	n/a	4.17E-03	4.17E-03
Zanker Landfill Tub Grinder Diesel Engine (S-24) 8 AM - 6 PM	0.203	3.05	751.7	2.15	66.16	n/a	2.520E-04	n/a	3.906E-02	n/a	n/a	0.67	10 (9)	893.3 (10)	4546 (10)	217.05 (10)	n/a	2.00E-03 (10)	n/a	3.10E-01 (10)	n/a	n/a
Zanker Landfill Demolition Plant No. 2 (S-25) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		6	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Gypsum Recycling Machine (S-27) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	8.62E-03	0.00556		6	70		1	n/a	n/a	n/a	n/a	0.068 (11)	0.044 (12)
Zanker Landfill 99 hp Gypsum Screening Diesel Engine (S-28) 8 AM - 6 PM	0.102	3.05	751.7	0.28	34.93	n/a	1.426E-04	n/a	6.300E-04	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	600 (10)	114.60 (10)	n/a	1.13E-03 (14)	n/a	5.00E-03 (14)	n/a	n/a
Zanker Landfill 196 hp Demoliton Plant No. 1 Diesel Engine (S-31) 8 AM - 6 PM	0.102	3.05	751.7	0.56	69.16	n/a	2.824E-04	n/a	6.300E-04	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	1188 (10)	226.89 (10)	n/a	2.24E-03 (14)	n/a	5.00E-03 (14)	n/a	n/a
Zanker MPF Landfill surface (S-1)	344	1.52	294.3	0.00	0.30	n/a	n/a	n/a	n/a	5.25E-04	0.00053	1,128	5	70		1	n/a	n/a	n/a	n/a	4.17E-03	4.17E-03
Zanker MPF Conveyer Feeder (S-2) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.33E-04	0.00019		10	70		1	n/a	n/a	n/a	n/a	0.0026 (13)	0.0015 (13)
Zanker MPF Jaw Crusher (S-3) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.33E-04	0.00019		10	70		1	n/a	n/a	n/a	n/a	0.0026 (13)	0.0015 (13)
Zanker MPF Screening System (S-4) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		10	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Incoming Stockpile (S-5) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		6	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Outgoing Stockpile (S-6) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		6	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Demolition Plant (S-7) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.47E-02	0.01747		6	70		1	n/a	n/a	n/a	n/a	0.275 (5)	0.139 (6)
Zanker MPF Wood Grinding and Transfer Operation (S-8) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	5.20E-02	0.02899		6	70		1	n/a	n/a	n/a	n/a	0.413 (5)	0.230 (6)
Zanker MPF 750 hp Tub Grinder Diesel Engine (S-9) 8 AM - 6 PM	0.203	3.05	294.3	2.1	66.16	n/a	1.081E-03	n/a	5.040E-03	n/a	n/a	0.67	10 (9)	70 (10)	4546 (10)	217.05 (10)	n/a	8.58E-03 (10)	n/a	4.00E-02 (10)	n/a	n/a
Zanker MPF Conveyers (S-10) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		10	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Wood Grinder (S-11) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.53E-02	0.01412		6	70		1	n/a	n/a	n/a	n/a	0.201 (5)	0.112 (6)
Zanker MPF 800 hp Diesel Engine (S-12) 8 AM - 6 PM	0.203	3.05	294.3	2.29	70.57	n/a	1.153E-03	n/a	1.680E-03	n/a	n/a	0.67	10 (9)	70.0 (10)	4849 (10)	231.52 (10)	n/a	9.15E-03 (10)	n/a	1.33E-02 (10)	n/a	n/a

Table H-6
Criteria Pollutant Modeling Inputs for Zanker Landfill and Zanker Materials Processing Facility
Dry Fermentation Anaerobic Digestion Facility Project

Averaging Period, Criteria Pollutant and Emitting Unit	Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Emission Rate, g/s: NOx	SO_2	CO	Combustion	Fugitive PM	Fugitive $PM_{2.5}$	Stack Dia	Exhaust Height, ft	Exhaust Temp, Deg F	Exhaust Flow Rate, ft^3/sec	Exhaust Velocity, ft/s	Emission Rate, lbs/hr: NOx	SO_2	CO	Combustion $PM_{10}/PM_{2.5}$	Fugitive PM_{10}	Fugitive $PM_{2.5}$
Averaging Period: Annual NO_2, SO_2 and PM_{10} in Normal Operation(3)																						
Zanker Landfill Wood Waste Plant (S-1) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	5.20E-02	0.02899		6	70		1	n/a	n/a	n/a	n/a	0.413 (5)	0.230 (6)
Zanker Landfill Yard Waste Plant (S-3) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	4.00E-02	0.0223		6	70		1	n/a	n/a	n/a	n/a	0.317 (5)	0.177 (6)
Zanker Landfill Feeder, Grizzly Screen and Conveyors at Co (S-11) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.47E-02	0.00818		10	70		1	n/a	n/a	n/a	n/a	0.116 (5)	0.065 (6)
Zanker Landfill Jaw Crusher at Concrete Recycling Plant (S-12) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	9.64E-03	0.00179		10	70		1	n/a	n/a	n/a	n/a	0.077 (7)	0.014 (8)
Zanker Landfill 3 Deck Screening System at Concrete Recycling Plant (S-13) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.93E-02	0.00357		10	70		1	n/a	n/a	n/a	n/a	0.153 (7)	0.028 (8)
Zanker Landfill Secondary Impact Crusher at Concrete Recycling Plant (S-14) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	9.64E-03	0.00179		10	70		1	n/a	n/a	n/a	n/a	0.077 (7)	0.014 (8)
Zanker Landfill Stockpile, Incoming at Concrete Recycling Plant (S-16) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	1.30E-02	0.00242		10	70		1	n/a	n/a	n/a	n/a	0.104 (7)	0.019 (8)
Zanker Landfill Stockpile, Outgoing at Concrete Recycling Plant (S-17) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	7.37E-03	0.00137		10	70		1	n/a	n/a	n/a	n/a	0.059 (7)	0.011 (8)
Zanker Landfill Soil aeration/rototilling (S-18) 8 AM - 6 PM		1.52	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		5	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Soil aeration/rototilling (S-19) 8 AM - 6 PM		1.52	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		5	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Demolition Plant No. 1 (S-20) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.13E-02	0.01747		6	70		1	n/a	n/a	n/a	n/a	0.249 (5)	0.139 (6)
Zanker Landfill surface (S-21)	344	1.52	294.3	0.0	0.30	0.000525	n/a	n/a	n/a	5.25E-04	0.00053	1,128	5	70		1	4.17E-03	n/a	n/a	n/a	4.17E-03	4.17E-03
Zanker Landfill Tub Grinder Diesel Engine (S-24) 8 AM - 6 PM	0.203	3.05	294.3	2.15	66.16	1.027083	1.081E-03	#VALUE!	4.867E-02	n/a	n/a	0.67	10 (9)	70.0 (10)	4546 (10)	217.05 (10)	8.15	8.58E-03 (10)	n/a	3.86E-01 (10)	n/a	n/a
Zanker Landfill Demolition Plant No. 2 (S-25) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	6.30E-04	0.00063		6	70		1	n/a	n/a	n/a	n/a	0.0050 (13)	0.0050 (13)
Zanker Landfill Gypsum Recycling Machine (S-27) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	8.62E-03	0.00556		6	70.0		1	n/a	n/a	n/a	n/a	0.068 (11)	0.044 (12)
Zanker Landfill 99 hp Gypsum Screening Diesel Engine (S-28) 8 AM - 6 PM	0.102	3.05	751.7	0.28	34.93	0.00063	1.426E-04	n/a	6.300E-04	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	600 (10)	114.60 (10)	0.0050 (13)	1.13E-03 (14)	n/a	5.00E-03 (14)	n/a	n/a
Zanker Landfill 196 hp Demoliton Plant No. 1 Diesel Engine (S-31) 8 AM - 6 PM	0.102	3.05	751.7	0.56	69.16	0.00063	2.824E-04	n/a	6.300E-04	n/a	n/a	0.33 (9)	10 (9)	893.3 (10)	1188 (10)	226.89 (10)	0.0050 (13)	2.24E-03 (14)	n/a	5.00E-03 (14)	n/a	n/a
Zanker MPF Landfill surface (S-1)	344	1.52	294.3	0.00	0.30	0.000263	n/a	n/a	n/a	5.25E-04	0.00053	1,128	5	70		1	2.08E-03	n/a	n/a	n/a	4.17E-03	4.17E-03
Zanker MPF Conveyer Feeder (S-2) 8 AM - 6 PM		3.05			0.30								10	70		1	n/a	n/a	n/a	n/a	0.0026 (13)	0.0015 (13)
Zanker MPF Jaw Crusher (S-3) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.33E-04	0.00019		10	70		1	n/a	n/a	n/a	n/a	0.0026 (13)	0.0015 (13)
Zanker MPF Screening System (S-4) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		10	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Incoming Stockpile (S-5) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		6	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Outgoing Stockpile (S-6) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		6	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Demolition Plant (S-7) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	3.47E-02	0.01747		6	70		1	n/a	n/a	n/a	n/a	0.275 (5)	0.139 (6)
Zanker MPF Wood Grinding and Transfer Operation (S-8) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	5.20E-02	0.02899		6	70		1	n/a	n/a	n/a	n/a	0.413 (5)	0.230 (6)
Zanker MPF 750 hp Tub Grinder Diesel Engine (S-9) 8 AM - 6 PM	0.203	3.05	294.3	2.15	66.16	0.132956	1.399E-04	#VALUE!	6.300E-03	n/a	n/a	0.67	10 (9)	70.0 (10)	4546 (10)	217.05 (10)	1.06	1.11E-03 (10)	n/a	5.00E-02 (10)	n/a	n/a
Zanker MPF Conveyers (S-10) 8 AM - 6 PM		3.05	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.84E-04	5.3E-05		10	70		1	n/a	n/a	n/a	n/a	0.0023 (13)	0.00042 (13)
Zanker MPF Wood Grinder (S-11) 8 AM - 6 PM		1.83	294.3	0.0	0.30	n/a	n/a	n/a	n/a	2.53E-02	0.01412		6	70		1	n/a	n/a	n/a	n/a	0.201 (5)	0.112 (6)
Zanker MPF 800 hp Diesel Engine (S-12) 8 AM - 6 PM	0.203	3.05	294.3	2.29	70.57	0.070247	1.153E-03	6.239E-03	1.680E-03	n/a	n/a	0.67	10 (9)	70.0 (10)	4849 (10)	231.52 (10)	0.56	9.15E-03 (10)	0.05	1.33E-02 (10)	n/a	n/a

1) Exhaust characteristics recommended in SJVAPCD (2006).
SJVAPCD. *Guidance for Air Dispersion Modeling*, Revision 1.2, August 2006.
2) Daily operation period (hrs, 8 AM - 6 PM) = 10
The lbs/hr emission rates, and the g/s modeling inputs, for the sources that only operate between 8 AM and 4 PM are divided by 8 hrs, not 24 hrs, because the other 16 hours have zero emission rates and modeling inputs.
3) Annual operating hours (hrs, 8 AM - 6 PM for 365 days) = 3,650
The lbs/hr emission rates, and the g/s modeling inputs, for the sources that only operate between 8 AM and 4 PM are divided by 365*8 hrs, not 8,760 hrs, because the other 365*16 hours have zero emission rates and modeling inputs.
4) The 4 CHP engines and the 3 flares do not operate simultaneously during the same hour, 3-hr period, 8-hr period or 24-hr period.
5) PM10 portion of total particulate (PM) collected in a cyclone on a woodwoking belt sander (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Appendix B.1 (Particle Size Distribution Data and Sized Emission Factors for Selected Sources), pages B-48 and B-49, October 1986 (%) = 52.9%
6) PM2.5 portion of total particulate (PM) collected in a cyclone on a woodwoking belt sander (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Appendix B.1 (Particle Size Distribution Data and Sized Emission Factors for Selected Sources), pages B-48 and B-49, October 1986 (%) = 29.5%
7) PM_{10} portion of total particulate (PM) for controlled tertiary crushing (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Chapter 11.19.2 (Crushed Stone Processing and Pulverized Mineral Processing), Table 11.19.2-2 (Emission Factors for Crushed Stone Processing Operation), page 11.19.2-8, August 2004 (%) = 45.0%
8) $PM_{2.5}$ portion of total particulate (PM) for controlled tertiary crushing (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Chapter 11.19.2 (Crushed Stone Processing and Pulverized Mineral Processing), Table 11.19.2-2 (Emission Factors for Crushed Stone Processing Operation), page 11.19.2-8, August 2004 (%) = 8.3%
9) Estimate
10) Assumed same as for Project's emergency Diesel generator engines.
11) PM_{10} portion of total particulate (PM) collected in a fabric filter in gypsum manufacturing (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Chapter 11.16 (Gypsum Manufacturing)), Table 11.16-4, page 11.16-8, July 1993 (%) = 76.0%
12) $PM_{2.0}$ portion of total particulate (PM) collected in a fabric filter in gypsum manufacturing (USEPA. "Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources), Chapter 11.16 (Gypsum Manufacturing)), Table 11.16-4, page 11.16-8, July 1993 (%) = 49.0%
13) Emission rate low enough to not register on permit daily emission inventory; hence, set at half the 0.1 lb/day minimum inventory entry.
14) Proportioned from large tub grinder Diesel engine specifications by horsepower.