

**DRAFT ENGINEERING EVALUATION  
GREEN EARTH MANAGEMENT, LLC  
PLANT 21186  
APPLICATION 27174**

**BACKGROUND**

Green Earth Management, LLC (GEM) is a new facility applying for an Authority to Construct and/or Permit to Operate for the following equipment:

- S-1 Tub Grinder with Diesel Engine, Model: Vermeer HG 4000, Model Year: 2014, Maximum Operating Rate: 30 tons/hr**
- S-2 Prime Diesel Engine, Make: FPT Model: F3HGE613D\*B, Model Year: 2015, Rated Horsepower: 515 bhp, Maximum Fuel Use Rate: 3.26 MMbtu/hr**

The S-1 tub grinder is powered by S-2 diesel engine and is equipped with a water suppression system to reduce particulate emissions during the wood grinding operation. The primary emissions from S-1 will consist of particulate matter from the wood grinding operation. The primary emissions from S-2 will consist of combustion byproducts including diesel particulates, nitrogen oxides, carbon monoxide, and sulfur dioxide generated from the diesel engine used to power the tub grinder.

The tub grinder will be located at 650 Kings Row, San Jose, CA and will be within 1,000 feet of the property boundary of San Jose Conservation Corps and Charter School (632 ft) and Challenger School - Berryessa (753 ft). Thus, GEM is subject to the public notice requirements set forth in the District Regulation 2-1-412.

**EMISSIONS SUMMARY**

**Annual and Maximum Daily Emissions:**

Emissions from Wood Grinding (S-1):

Basis:

- Operating hours of 7 hrs/day, 6 days/wk, 48 wks/yr (2,016 hrs/yr).
- The tub grinder has maximum operating rate of 30 tons/hr.
- The annual throughput limit for the tub grinder is 60,480 tons.
- The emission factor for “Log Debarking” from a previous edition of EPA Document AP-42, Table 10.3-1 (0.024 lb TSP/ton) was used to estimate total suspended particulate (TSP).
- The tube grinder is equipped with a water suppression system. Thus, control efficiency of 50% was assumed for the particulate emission in accordance with BAAQMD Permit Handbook Chapter 11.13 “Tub Grinders”.
- The 60% of the TSP was assumed to be PM<sub>10</sub> in accordance with BAAQMD Permit Handbook Chapter 11.13 “Tub Grinders”.

Annual PM<sub>10</sub> Emissions (lbs/yr) = (30 tons/hr) (2,016 hrs/yr) (0.024 lbs TSP/ton) (0.60 lbs PM<sub>10</sub>/lb TSP) (50%) = 435.5 lbs/yr = 0.218 TPY

Daily Maximum PM<sub>10</sub> Emissions = (435.5 lbs/yr) / (288 days/yr) = 1.51 lbs/day

Emissions from Diesel Engine (S-2):

Basis:

- Operating hours of 7 hrs/day, 6 days/wk, 48 wks/yr (2,016 hrs/yr).
- The diesel engine powering the grinder is rated at 515 brake horsepower (bhp) output.
- The diesel engine has an EPA Engine Family Name FFPXL12.9TSS, and meets the Tier 4 Final Emission Standards.

- The emission factors for NO<sub>x</sub>, CO, POC, and PM<sub>10</sub> were provided by the engine manufacturer.

The emission factor for SO<sub>2</sub> is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors, which is based on full conversion of fuel sulfur to SO<sub>2</sub> and which will therefore be considered applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.0015 wt% sulfur):

$$\text{SO}_2: 8.09\text{E-}3 (\% \text{ S in fuel oil}) \text{ lbs/hp-hr} = 8.09\text{E-}3 (0.0015\% \text{ S}) (454 \text{ g/lb}) \\ = 0.0055 \text{ g/hp-hr}$$

Daily emissions are calculated to establish whether a source triggers the requirement for Best Available Control Technology (10 lbs/highest day total source emissions for any class of pollutants). Annual and maximum daily emissions due to diesel combustion are presented in Table 1.

The total emissions expected due to wood grinding and diesel combustion activities from operation of S-2 are presented in Table 2.

**Table 1 – Annual and Maximum Daily Emissions due to Diesel Combustion (S-2)**

Operating Hours (hr/yr)	Max Rated Output (bhp)	Fuel Use Rate (gal/hr)	Fuel Use Rate (MMBTU/hr)	Pollutant	Emission Factors (g/bhp-hr)	Max Daily Emissions (lbs/day)	Annual Emissions (lb/yr)
2,016	515	25.4	3.26	NO <sub>x</sub>	0.22	1.75	503.1
				CO	0.015	0.12	34.3
				POC	0.002	0.02	4.6
				PM <sub>10</sub>	0.015	0.12	34.3
				SO <sub>2</sub>	0.0055	0.04	12.6

**Table 2 – Total Emissions from S-1 and S-2**

Pollutant	Emissions from Wood Grinding (lbs/yr)	Emissions from Diesel Engine (lbs/yr)	Total Emissions		
			(lbs/day)	(lbs/yr)	(TPY)
NO <sub>x</sub>	0	503.1	1.75	503.1	0.252
CO	0	34.3	0.12	34.3	0.017
POC	0	4.6	0.02	4.6	0.002
PM <sub>10</sub>	435.5	34.3	1.63	469.8	0.235
SO <sub>2</sub>	0	12.6	0.04	12.6	0.006

**PLANT CUMULATIVE INCREASE**

The cumulative increase for GEM is presented in Table 3.

**Table 3 – Cumulative Increase for Green Earth Management, LLC (Plant #21186)**

<b>Pollutant</b>	<b>Current (TPY)</b>	<b>Increase (TPY)</b>	<b>New Total (TPY)</b>
NO <sub>x</sub>	0.000	0.252	0.252
CO	0.000	0.017	0.017
POC	0.000	0.002	0.002
PM <sub>10</sub>	0.000	0.235	0.235
SO <sub>2</sub>	0.000	0.006	0.006

**HEALTH RISK SCREENING ANALYSIS (HRSA)**

The calculated emissions increase of diesel exhaust particulate matter (PM) associated with the engine, S-2, are in excess of the chronic risk screening trigger as set forth in Regulation 2, Rule 5 as shown below.

<b>PM<sub>10</sub> Emission Factor for the Engine (g/bhp-hr)</b>	<b>HP</b>	<b>Annual Usage (hrs/yr)</b>	<b>Diesel Exhaust Particulate Emissions from the Engine (lbs/yr)</b>	<b>Trigger Level (lbs/yr)</b>
0.015	515	2,016	34.3	0.34

S-2 meets Best Available Control Technology for toxics (TBACT) since the diesel particulate emission rate equals 0.01 g/bhp-hr. The project must pass the toxic risk screening level of less than 10 in one million for cancer risk, 1 for chronic hazard index, and 1 for acute hazard index in order to comply with the limit set forth in Regulation 2, Rule 5. Estimates of residential risk assume exposure to annual average toxic air contaminant concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume exposure occurs 8 hours per day, 245 days per year, for 40 years. Risk estimates for students assume a higher breathing rate, and exposure is assumed to occur 10 hours per day, 36 weeks per year, for 9 years.

Based on 8,760 hours per year of operation, the emergency generator set passed the Health Risk Screening Analysis (HRSA) conducted on June 28, 2016 by the District's Toxic Evaluation Section. The increased cancer risk to the maximally exposed receptor (residents) is 3.7 in a million. With the expected 2,016 hours per year of operation, the increased cancer risk to the maximally exposed receptor for this project is 0.9 in a million. In accordance with the District's Regulation 2-5, this risk level is considered acceptable, as it has been determined that the diesel engine used to power S-2 meets the current TBACT standards.

**STATEMENT OF COMPLIANCE**

The owner/operator of S-1 and S-2 shall comply with Regulation 6-1 (Particulate Matter and Visible Emissions Standards). In addition, S-2 shall comply with Regulation 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations).

The owner/operator of S-2 is expected to comply with Regulation 6-1, since the engine used to power S-2 meets the Tier 4 Final Standards and the tub grinder, S-1, is abated by a water suppression system. Ultra-low sulfur diesel (15 ppm sulfur) will be used to meet the sulfur limitation of 0.5 wt% in Regulation 9-1-304 as well as to minimize PM<sub>10</sub> emissions. Because S-2 uses diesel fuel, Regulation 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines) exempts the engines from the emission limits in Sections 9-8-301 through 305. Allowable operating hours

and the corresponding record keeping in Regulation 9-8-330 and 530 will be included in the permit conditions.

The diesel engine powering the tub grinder is subject to the Stationary Diesel Airborne Toxics Control Measure (ATCM) and is considered new stationary emergency standby diesel engine since it will be installed after January 1, 2005 and is larger than 50 hp. The requirements of the ATCM will be included in the permit conditions.

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors outlined in the Permit Handbook Chapter 2.3.1 and 11.13 and therefore is not discretionary as defined by CEQA.

The project is within 1,000 feet from the nearest school and therefore is subject to the public notification requirements of Reg. 2-1-412. Notifications will be distributed to parents or guardians of children enrolled at San Jose Conservation Corps and Charter School and Challenger School - Berryessa and all residential and business neighbors within 1,000 feet of the proposed new source.

**Best Available Control Technology (BACT):**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>. Based on the emission calculations above, the owner/operator of S-1 and S-2 is not subject to BACT, since S-1 and S-2 does not exceed 10 pounds or more per highest day for POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>.

**Offsets:**

In accordance with Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits more than 10 tons per year of POC or NO<sub>x</sub>. Since the facility's permitted emissions are less than 10 tons per year of POC or NO<sub>x</sub>, offset is not required.

**New Source Performance Standards (NSPS):**

The diesel engine, S-2, is subject to 40 CFR 60, Subpart III, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after 2011, as required by Section 60.4201(c).

The engine has a total displacement of 12.9 liters and 6 cylinders. Therefore, each cylinder has a volume of less than 10 liters. The engine is a 2015 engine and is not a fire pump. Section 60.4201(c) requires these engines to comply with the standards in Section 60.4201 that apply to the same model year and maximum engine power. For engines above 50 hp, below 3,000 hp, and that have a displacement less than 10 liters per cylinder, the requirement is to comply with the certification standards in 40 CFR 1039.101 and 1039.105 for all pollutants.

For engines between 130 and 560 kW (174 and 750 hp), the standards in 40 CFR 1039.101 are:

- NO<sub>x</sub>: 0.40 g/kW-hr (0.30 g/hp-hr)
- NMHC: 0.19 g/kw-hr (0.14 g/hp-hr)
- CO: 3.5 g/kW-hr g/hp-hr (2.6 g/hp-hr)
- PM: 0.02 g/kW-hr (0.01 g/hp-hr)

Section 40 CFR 1039.105 states that the exhaust opacity must not exceed:

- 20 percent during acceleration
- 15 percent during lugging
- 50 percent during peaks in acceleration or lugging modes

Since the engine has been certified by EPA, it will comply with the above standards.

The owner/operator is expected to comply with Sections 60.4206 and 60.4211(a), which require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213.

Section 60.4214 states that owner/operator does not have to submit an initial notification to EPA for emergency engines.

Because the engine has a diesel particulate filter, it is expected to comply with Section 60.4214(c).

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions.

**Prevention of Significant Deterioration (PSD):**

The emission increase resulting from this project is expected to be less than 1 TPY for any class of pollutants. Since it is far below the PSD thresholds, the project is not subject to PSD review.

**National Emission Standards for Hazardous Air Pollutants (NESHAP)**

The engine is subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Because it is a new engine at an area source, the engine must meet the requirements in 40 CFR part 60 subpart IIII and no further requirements apply to this engine under this subpart according to §63.6590(c)(1).

**PERMIT CONDITIONS**

S-1 and S-2 will be subject to Permit Condition Number 26359.

Application #27174 - Green Earth Management, LLC  
S-1 Tub Grinder and S-2 Prime Diesel Engine

1. The owner/operator shall fire S-2 Diesel Engine exclusively with ultra low sulfur diesel. (basis: Cumulative increase, BACT, Toxic Risk Screen)
2. The owner/operator of S-1 Tub Grinder with S-2 Diesel Engine shall not operate for more than 2,016 hours in any consecutive 12-month period. (basis: Cumulative increase, BACT, Toxic Risk Screen)
3. The owner/operator of S-1 Tub Grinder shall not process more than 60,480 tons of wood in any consecutive 12-month period. (basis: Cumulative increase)
4. The owner/operator shall abate the emissions from S-1 Tub Grinder with a water suppression system at all times. (basis: Cumulative increase)
5. The owner/operator shall equip the S-2 Diesel Engine with either:
  - a. a non-resettable totalizing meter that measures hours of operation for the engine; or
  - b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.(basis: Cumulative Increase)

6. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions.

- a. Daily hours of operation.
- b. Daily consumption of diesel fuel (in gallons).
- c. Hours of operation and amount of diesel fuel in parts a and b shall be totaled on a rolling consecutive 12-month quarter basis.

The owner/operator shall record all records in a District-approved log. The owner/operator shall retain the records with the equipment for at least two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Toxic Risk Screen, Cumulative Increase, Regulation 1-441)

**RECOMMENDATION**

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of the Authority to Construct for the following source:

- S-1 Tub Grinder with Diesel Engine, Model: Vermeer HG 4000, Model Year: 2014, Maximum Operating Rate: 30 tons/hr**
- S-2 Prime Diesel Engine, Make: FPT Model: F3HGE613D\*B, Model Year: 2015, Rated Horsepower: 515 bhp, Maximum Fuel Use Rate: 3.26 MMBtu/hr**

By: \_\_\_\_\_  
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Date: \_\_\_\_\_