

# - DRAFT -

## ENGINEERING EVALUATION

### Lafayette Library

Application #21278 - Plant #19984

**3491 Mt. Diablo Blvd.  
Lafayette, CA 94549**

#### I. BACKGROUND

Lafayette Library, through their contractor Delta Electrical, is applying for an Authority to Construct/Permit to Operate for the following equipment:

**S-1 Emergency Diesel Generator, Caterpillar, Model C4.4, EPA Engine Family No. 7PKXL04.4RE1, 72.4 HP.**

The Emergency Diesel Engine Generator Set (S-1) was purchased in 2007 and installed in 2008. This application was submitted in November of 2009. In order to comply with the ATCM, a Diesel Particulate Filter (DPF) will be installed to reduce diesel PM to 0.08 g/bhp-hr., to minimize the release of air borne criteria pollutants and hazardous air pollutants due to fuel combustion. The criteria pollutants are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>). All of these pollutants are briefly discussed on the District's web site at [baaqmd.gov](http://baaqmd.gov).

The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.05% by weight. The operation of this engine, S-1, should not pose any health threat to the surrounding community or the public at large.

#### II. EMISSION CALCULATIONS

The S-1 Diesel Engine has been certified by CARB to be a cleaner burning engine. Except for SO<sub>2</sub>, the emission factors for this engine are from the CARB Certification (CARB Executive Order # U-R-022-0094-1). The SO<sub>2</sub> emissions were calculated based on the maximum allowable sulfur content (0.05 wt% S) of the diesel fuel with assumption that all of the sulfur present will be converted to SO<sub>2</sub> during the combustion process. The emissions calculation is as follows:

Emissions from S-1:

Hours of Operation = 50 hr/yr

Diesel Heat Capacity = 140,000 BTU/gal

Fuel Consumption = 3.1 gal/hr

Estimated Fuel Usage = 3.1 gal/hr X 50 hr/yr = 155 gal/yr.

NO<sub>x</sub> = 4.61 g/bhp-hr (72.4 hp)(1 lb/454 g)(50 hr/yr) = 36.8 lb/yr or 0.018 TPY

CO = 1.12 g/bhp-hr (72.4 hp)(1 lb/454 g)(50 hr/yr) = 8.93 lb/yr or 0.004 TPY

POC = 0.242 g/bhp-hr (72.4 hp)(1 lb/454 g)(50 hr/yr) = 1.93 lb/yr or 0.001 TPY

PM<sub>10</sub> = 0.08 g/bhp-hr (72.4 hp)(1 lb/454 g)(50 hr/yr) = 0.638 lb/yr or 0.0003 TPY

SO<sub>x</sub> = (3.1 gal/hr)(7.1 lb/gal)(0.0005S)(64 lb SO<sub>2</sub>/32 lb S)(50 hr/yr) = 1.1 lb/yr or 0.0006 TPY

**III. PLANT CUMULATIVE INCREASE AFTER 4/5/91**

|                    | <u>Current</u><br><u>Ton/yr</u> | <u>New</u><br><u>Ton/yr</u> | <u>New Total</u> |                |
|--------------------|---------------------------------|-----------------------------|------------------|----------------|
|                    |                                 |                             | <u>Lbs/yr</u>    | <u>Tons/yr</u> |
| POC =              | 0.00                            | 0.001                       | 1.93             | 0.001          |
| NO <sub>x</sub> =  | 0.00                            | 0.018                       | 36.8             | 0.018          |
| SO <sub>2</sub> =  | 0.00                            | 0.000                       | 1.1              | 0.000          |
| CO =               | 0.00                            | 0.004                       | 8.9              | 0.004          |
| NPOC =             | 0.00                            | 0.000                       | 0                | 0.000          |
| PM <sub>10</sub> = | 0.00                            | 0.000                       | 0.64             | 0.000          |

**IV. TOXIC SCREENING ANALYSIS**

S-1 does meet Best Available Control Technology for toxics (TBACT) since a diesel particulate filter will be installed and the diesel particulate emissions are less than 0.15 gr/bhp-hr. For an engine that meets the TBACT requirement, it must also pass the toxic risk screening level of less than ten in a million. The cancer risk is conservative. It assumes a constant exposure of the ultra sensitive population (young people, the elderly, and the infirm, etc...) at 24 hours for a 70 years life.

This emergency generator passed the Health Risk Screening Analysis (HRA) conducted on May 17, 2006 by the District's Toxic Evaluation Section. The source poses no significant toxic risk, since the risks to the maximally exposed residential and industrial receptors are 0.13 and 0.53 in a million, respectively. The hazard indexes for the residential and industrial receptors are less than 0.0000475 and 0.000375, respectively, based on 50 hours operation per year. The level of risk for students at Lincoln Elementary School is 0.04 in a million and the hazard index is 0.0000323. Thus, in accordance with the risk management policy, the screen passes, since the engine meets the TBACT requirement of 0.15 g/BHP-hr limitation for particulate emission.

**V. BEST AVAILABLE CONTROL TECHNOLOGY**

S-1 from this facility triggers BACT since the emission rate of NOx from this source is more than 10 pounds of emission per highest day per Regulation 2-2-301. The use of post emission filtration devices or a Selective Catalytic Reduction (SCR) System to meet BACT(1) is not required because it is not cost effective for a unit that will be used only during emergency and reliability-related activities. Source S-1 will comply with BACT(2) because it is CARB certified at the level below the BACT(2) requirements. BACT(2) requirements can be found on the District’s web site under BACT/TBACT Handbook, Section 2 – Combustion Sources for I.C. Engine – Compression Ignition ≥ 175 HP, Document # 96.1.2.

|             | <u>S-1 CARB certified</u> | <u>BACT(2)</u> |
|-------------|---------------------------|----------------|
| NOx         | 4.61 g/bhp-hr             | 6.9 g/bhp-hr   |
| CO          | 1.12 g/bhp-hr             | 2.75 g/bhp-hr  |
| POC         | 0.242 g/bhp-hr            | 1.5 g/bhp-hr   |
| PM10-diesel | 0.08 g/bhp-hr             | 0.15 g/bhp-hr  |

**VI. OFFSETS**

Offsets are not required since the facility's POC, and NOx emissions are less than 15 ton/yr per Regulation 2-2-302.

**VII. STATEMENT OF COMPLIANCE**

Source S-1 is subject to and expected to be in compliance with the requirements of District Regulation 1-301 “Public Nuisance”, District Regulation 6 “Particulate Matter and Visible Emissions”, Regulation 9-8 “NOx and CO from Stationary Internal Combustion Engines” and Regulation 9-1 “Sulfur Dioxide”. In order to ensure compliance with the requirements of these regulations, the facility will be conditionally permitted to meet the requirements.

This 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 emission factors in accordance with Permit Handbook Chapter 2.3.1.

The project is within 1000 feet of the nearest school and therefore the owner/operator is subject to the public notification requirements of Reg. 2-1-412. A public notice was prepared and sent on Date----. The public notices were sent to:

- All addresses within ¼ mile of the diesel generator.
- Parents and guardians of students at Lafayette Elementary School and Old Firehouse School.

At the end of the comment period, that lasted for more than 30 days, there were ?? written comments. ??? phone-mail messages and ??? e-mail messages were received from parents of students at Lafayette Elementary School and Old Firehouse School .

Offsets, PSD, NSPS, and NESHAPS are not triggered.

**VIII. CONDITIONS****Permit condition for S-1, Emergency Generator, 72.4 HP, Lafayette Library, Plant # 19984, Application # 21278**

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.  
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. [Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]
3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1)]
4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
  - a. Hours of operation for reliability-related activities (maintenance and testing).
  - b. Hours of operation for emission testing to show compliance with emission limits.
  - c. Hours of operation (emergency).
  - d. For each emergency, the nature of the emergency condition.
  - e. Fuel usage for each engine(s).

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), (or, Regulation 2-6-501)]

**5. At School and Near-School Operation**

If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

- a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
- b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e) (2) (B) (2) ]

**IX. RECOMMENDATION**

Waive the Authority to Construct and Issue conditional Permit to Operate to RWC, LLC., for the following equipment:

- S-1      Emergency Diesel Generator, Caterpillar, Model C4.4, EPA Engine Family No. 7PKXL04.4RE1, 72.4 HP.**

*Craig Ullery  
Air Quality Engineer II  
Permit Services Division*

*Date: 5/25/10\_\_\_\_\_*

CSU:C\21278Lafayette