

ENGINEERING EVALUATION
Daly City Fire Station No. 92
PLANT NO. 15328
APPLICATION NO. 7310

BACKGROUND

The Daly City Fire Station No. 92 is applying for an Authority to Construct and/or Permit to Operate the following equipment:

S-1 Emergency Diesel Generator: Generac SD080 with Deutz Engine BF4M1013EC, 125 HP

The Daly City Fire Station is an Essential Public Service under Regulation 9-8-233.4 and will be allowed 170 hours per year of reliability and maintenance related activity. Regulation 9-8-331 allows up to 200 hours per year for reliability and maintenance, but the applicant will be conditionally permitted at 170 hours per year to pass the risk screen. The applicant's representative, Lawrence Law of NBC General Contractor Corporation, confirmed via phone call on April 28, 2003, that 170 hours per year of reliability and maintenance operation is acceptable.

EMISSIONS SUMMARY

Annual Emissions:

The 125 HP diesel engine is CARB/EPA approved (engine family number 2DZXL07.1004). Emission factors are taken from the '2002 CARB Certified Offroad Heavy Duty Diesel Engine List'. Daly City Fire Station No. 92 is allowed to operate the engine for maintenance and reliability-related activities for 170 hr/yr.

NOx	5.64 g/hp-hr
CO	0.70 g/hp-hr
POC	0.28 g/hp-hr
PM10	0.09 g/hp-hr

The emission factor for SO₂ is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.

$$\text{SO}_2 \quad 8.09\text{E-}3 \text{ (\% S in fuel oil) lb/hp-hr} = 8.09\text{E-}3 \text{ (0.05\% S) (454 g/lb)} = 0.184 \text{ g/hp-hr}$$

NOx	= (5.64 g/hp-hr)(125 hp)(170 hrs/yr)(lb/454g) = 263.99 lb/yr = 0.132 TPY
CO	= (0.70 g/hp-hr)(125 hp)(170 hrs/yr)(lb/454g) = 32.76 lb/yr = 0.016 TPY
POC	= (0.28 g/hp-hr)(125 hp)(170 hrs/yr)(lb/454g) = 13.10 lb/yr = 0.007 TPY
PM10	= (0.09 g/hp-hr)(125 hp)(170 hrs/yr)(lb/454g) = 4.21 lb/yr = 0.002 TPY
SO ₂	= (0.184 g/hp-hr)(125 hp)(170 hrs/yr)(lb/454g) = 8.61 lb/yr = 0.004 TPY

Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

NOx	= (5.64 g/hp-hr)(125 hp)(24 hrs/day)(lb/454g) = 37.27 lb/day
CO	= (0.70 g/hp-hr)(125 hp)(24 hrs/day)(lb/454g) = 4.62 lb/day
POC	= (0.28 g/hp-hr)(125 hp)(24 hrs/day)(lb/454g) = 1.85 lb/day
PM10	= (0.09 g/hp-hr)(125 hp)(24 hrs/day)(lb/454g) = 0.59 lb/day
SO ₂	= (0.184 g/hp-hr)(125 hp)(24 hrs/day)(lb/454g) = 1.21 lb/day

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NOx	0	0.132	0.132
POC	0	0.007	0.007
CO	0	0.016	0.016
SO2	0	0.004	0.004
PM10	0	0.002	0.002
NPOC	0	0	0

Toxic Risk Screening:

The toxic emission of diesel particulate exceeds the District Risk Screening Trigger and a Risk Screening Analysis has been performed.

Toxic Pollutant (200 hours)	Emission Rate (lb/yr)	Risk Screening Trigger (lb/yr)
Diesel Exhaust Particulate Matter (PM10)	4.96	0.64

A Risk Screen was initially performed for 200 hours of maintenance and reliability related activity but failed the screen with the cancer risk to maximally exposed residential receptors of 11.7 in a million (see memo from Toxics Group, April 24, 2003). The applicant has agreed to accept a permit condition of 170 hours of operation per year, excluding periods when operation is required due to emergency conditions, to pass the risk screen with the maximum cancer risk of 10 in a million and a hazard index is less than one.

Receptor	Cancer Risk in a million*	Hazard Index*
Residential	10	0.007
Our Lady of Perpetual Help (K-8)	0.062	0.002
Woodrow Wilson Elementary	0.0085	0.00017

* 170 hours of maintenance and reliability related activity

The level of risk has been determined as acceptable under the risk management policy for diesel-fueled reciprocating engines that meet the TBACT requirement (PM10 emissions less than 0.15 g/hp-hr). For engines that meet TBACT requirements, the maximum acceptable cancer risk for the project is 10 in a million.

STATEMENT OF COMPLIANCE

The owner/operator of S-1 shall comply with Reg. 6 (Particulate Matter and Visible Emissions Standards) and Reg. 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). Low sulfur diesel (0.05wt%) will be used to meet the sulfur limitation of 0.5wt% in Reg. 9-1-304. Because S-1 is an emergency standby generator, Reg. 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides from Stationary Gas Turbines) exempts the requirements for emission limits of Sections 9-8-301, 302, and 502. Allowable operating hours and the corresponding record keeping in Reg. 9-8-331 and 530 will be included in the Permit Conditions below.

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 and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3)

The project is within 1000 feet from 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 *May XX, 2003* to:

All addresses within 1000 feet of the diesel generator
Parents and guardians of students at Our Lady of Perpetual Help
Parents and guardians of students at Woodrow Wilson Elementary

[Insert summary of comments received over the 30-day comment period. Insert summary of the responses given.]

Best Available Control Technology: In accordance with Regulation 2, Rule 2, Section 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_x, CO, SO₂ or PM₁₀. Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutant: NO_x. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines.

The owner/operator satisfies BACT 2 for NO_x, CO, and POC since the engine satisfies the emission factor standards. The owner/operator meets BACT 2 standards for PM10 and SO2 since California Diesel Fuel of <0.05% by weight sulfur will be used.

	<u>Manufacturer's Data</u>	<u>BACT 2</u>
NO _x	5.64 g/hp-hr	6.90 g/hp-hr
CO	0.70 g/hp-hr	2.75 g/hp-hr
POC	0.28 g/hp-hr	1.50 g/hp-hr

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 15 tons/yr of POC or NO_x. The District may provide offsets from the Small Facility Banking Account for a facility with emissions between 15 and 50 tons/yr of POC or NO_x, provided that facility has no available offsets, and all existing sources of POC and/or NO_x are equipped with Best Available Retrofit Control Technology (BARCT). Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Conditions for S-1

1. The owner/operator shall fire S-1 exclusively with diesel fuel with sulfur content no greater than 0.05wt%.
(basis: Cumulative Increase, BACT)
2. The owner/operator shall operate S-1 only under the following circumstances:
 - a) For emergency use for an unlimited number of hours.
 - b) For reliability-related activities so long as total hours of operation for this purpose do not exceed 170 hours in a calendar year.(basis: Reg. 9-8-331, Cumulative Increase, Toxics Risk Screen)

Emergency use is defined by the following circumstances:

- a) In the event of loss of regular natural gas supply;
- b) In the event of failure of regular electric power supply;
- c) Flood mitigation;
- d) Sewage overflow mitigation;
- e) Fire;
- f) Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

(basis: Reg. 9-8-231)

Reliability-related activities are defined as either:

- a) Operation of an emergency standby engine to test its ability to perform for an emergency use; or
- b) Operation of an emergency standby engine during maintenance of a primary motor.

(basis: Reg. 9-8-232)

3. The owner/operator of S-1 shall not exceed the following emissions limits:

NOx 6.90 g/hp-hr

(basis: BACT)

4. The owner/operator shall equip S-1 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: Reg. 9-8-530: Record keeping)

5. 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 monthly log of usage shall indicate the following:

- a) Hours of operation (total)
- b) Hours of operation (emergency)
- c) For each emergency, the nature of the emergency condition

The owner/operator shall record all records in a District-approved log. The owner/operator shall retain the records on-site for 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: Cumulative Increase, Regulation 1-441, Reg. 9-8-530: Record keeping)

RECOMMENDATION

Waive Authority to Construct and issue a Permit to Operate to Daly City Fire Station No. 92 for the following source:

S-1 Emergency Diesel Generator: Generac SD080 with Deutz Engine BF4M1013EC, 125 HP

EXEMPTIONS

None.

By: _____

Pamela J. Leong
Air Quality Engineer
April 28, 2003