ENGINEERING EVALUATION REPORT

Plant Name:	**ST ROSE HOSPITAL**
Application Number:	**19218**
Plant Number:	**2099**

BACKGROUND

The applicant is applying for an Authority to Construct for a new Emergency Stand-By Diesel Power Generator Set. The applicant is requesting an Authority to Construct for the following equipment:

S-9 Emergency Stand-By Diesel Generator Set; Cummins Model 150DSGAC/QSB7-G3 NR3, 250 BHP

CUMULATIVE EMISSIONS CALCULATIONS

The proposed engine has been certified by the California Air Resources Board under Executive Order U-R-002-0445. CARB emission factors for this engine were used for all criteria pollutants. The emission factors used are as follows:

PM	0.127	g/bhp-hr
ORG	0.138	g/bhp-hr
NOx	2.621	g/bhp-hr
SO2[1]	0.005	g/bhp-hr
CO	1.193	g/bhp-hr

The applicant requested operation at 50 hours per year per engine, which is consistent with the California Air Resources Board Air Toxic Control Measure for Diesel Particulate Matter, 17 CFR 93115, Air Toxic Control Measure for Stationary Compression Ignition Engines (December 4, 2004). At a 50 hour per year per engine testing and maintenance limitation, criteria emissions are as follows:

[1] See Attachment 1 for derivation of SO2 emission factor

		PM10	ORG	NOX	SO2	CO
SOURCE	**BHP**	**G/BHP-HR**	**G/BHP-HR**	**G/BHP-HR**	**G/BHP-HR**	**G/BHP-HR**
S-9	**250**	**0.127**	**0.138**	**2.621**	**0.005**	**1.193**
TOTAL G/HR		**32**	**34**	**655**	**1**	**298**
TOTAL LB/HR		**0.07**	**0.08**	**1.44**	**0.00**	**0.66**
TOTAL LB/DAY		**1.68**	**1.82**	**34.67**	**0.07**	**15.78**
TOTAL LB/50 HR		**3.493**	**3.80**	**72.23**	**0.14**	**32.88**
TOTAL TPY		**0.002**	**0.002**	**0.036**	**6.9E-05**	**0.016**

All emission factors from CARB certification U-R-002-0445
SO2 Emission Factor based on 0.0015% bw sulfur fuel

TOXIC RISK MODELING

The District uses PM10 emissions as a proxy for toxic emission exposure to surrounding residential and industrial populations. A PM10 emissions level of 0.58 lbs/year automatically triggers a health risk assessment according to Regulation 2, Rule 5. At a maximum 50 hours per year permitted operation of this engine, this application exceeds a PM10 emission level of 0.58 lbs/year and so requires that a health risk assessment be performed.

Meteorological data was available for this site, and an ISCST3 model using "UNI" meteorological data was used to estimate maximum annual average ambient PM10 concentrations. The model was modified to reflect operations that occur only during normal working hours. Model runs were made with both urban and rural dispersion coefficients. The site is in a residential/ commercial zone, with the closest residential receptor located approximately 700 feet from the proposed source. There are two schools within 1,000 feet of the proposed source; Martin Luther King Jr High School (648 feet), and Eldridge Elementary School (560 feet). The source is vertical without a raincap.

At 50 hr/year operation per engine, the highest residential and school cancer risks were obtained by modeling emissions using rural terrain dispersion coefficients. The highest non-residential cancer risk was obtained by modeling emissions using urban terrain dispersion coefficients. Associated health hazard indices are less than 1.0 for all cases. The estimated health risks are summarized in the table below.

Receptor	Model Terrain	Cancer Risk (per million)	Chronic Non-cancer Hazard Index
Resident	Rural	0.56	3.4 E-4
Worker	Urban	0.87	6.2 E-4
Martin Luther King Jr HS	Rural	0.03	6.3 E-5

Eldridge Elementary School	Rural	0.1	2.4 E-4

The maximum calculated carcinogenic risk is below 10 in a million and the maximum calculated chronic hazard index is less than 1.0, and so the generator as proposed is acceptable under Regulation 2, Rule 5.

BACT/TBACT REVIEW

Under Regulation 2, Rule 2, any new source which results in an increase of criteria pollutants must be evaluated for adherence to BACT control technologies. For compression ignition I.C. engines with firing rates greater than or equal to 175 BHP, this means the engine must be fired on "California Low Sulfur Diesel Fuel" (fuel oil with less than 0.0015% by weight sulfur content, and less than 20% by volume aromatic hydrocarbons). TBACT requires that the engines emit no more than 0.15 g/bhp-hr of PM10, and BACT requires that the engines emit no more than 6.9 g/bhp-hr of NOx and 2.75 g/bhp-hr of CO. The proposed engine meets BACT and TBACT requirements.

COMPLIANCE DETERMINATION

This generator is covered under ministerial exemption, Chapter 2.3 of the BAAQMD Permit Handbook. CEQA is not triggered for emergency standby generators under this provision.

The generator is governed by and complies with the **California Air Resources Board's Air Toxic Control Measure for Stationary Compression Ingition Engines, CCR Title 17, Section 93115.** The explicit annual equipment usage limitation of 50 hours per year except for operation under emergency conditions (Reg 9-8-330) will be included as part of the permit conditions.

The generator is governed by and complies with the provisions of **Regulation 2, Rule 5, "New Source Review for Toxic Air Contaminants."**

The generator is exempt from emission limitations of District **Regulation 9, Rule 8-301 through 9-8-305**, "Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines," since it meets the provisions of **Regulation 9, Rule 8-111**, (Limited Exemption for Low Usage; Operation of Less than 100 Hours per Year Exclusive of Emergency Operations).

Visible emissions will be required to meet Ringelmann 2.0 limitation per **Regulation 6-303.1**.

These is a new source, and no sources will be closed down in connection with this application. The facility will not emit more than 10 TPY of POC or nitrous oxides, and so is not subject to emission offset requirements under Regulation 2-2-302 (see Attachment 2, Total Potential to Emit). The facility is not a Major Facility under Regulation 2-2-220, and so is not subject to PM10 or SO2 emission offset requirements under Regulation 2-2-303.

CONDITIONS

Condition #22850, setting out the operating conditions and recordkeeping requirements for operations at Source S-9 shall be made part of the source's Authority to Construct/Permit to Operate.

RECOMMENDATION

I recommend that an Authority to Construct be issued for the following source:

S-9 Emergency Stand-By Diesel Generator Set; Cummins Model 150DSGAC/QSB7-G3 NR3, 250 BHP

subject to Condition #22850.

By _____ **Date** **1/15/09**

Catherine S. Fortney

COND# 22850 ----------

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, playground, 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)]

End of Conditions

ATTACHMENT 1
DERIVATION OF SO2 EMISSION FACTOR

0.0015	% bw S	
91.8	lb/hr	(from CARB U-R-002-0445)
0.001377	lb S/hr	
32.06	lb S/lb mol	
64.06	lb SO2/lb mol	
0.002751	lb SO2/hr	
0.066034	lb SO2/day	
0.137571	lb SO2/yr	
6.88E-05	TPY	
1.248045	g/hr	
250	BHP	(from manufacturer's specifications)
0.005	g/bhp-hr	

ATTACHMENT 2
FACILITY-WIDE POTENTIAL TO EMIT