DRAFT
ENGINEERING EVALUATION REPORT
DOWNTOWN PROPERTIES V, LLC
PLANT NUMBER 17604
APPLICATION NUMBER 19867

BACKGROUND

On behalf of Downtown Properties V, LLC, Mas Asset Management Corporation has applied to obtain a Permit to Operate the following equipment:

S-2 Emergency Standby Diesel Engine-Generator Set (for fire sprinkler system), Cummins; Model: QSL9-G2-NR3/2007; Rated Horsepower 364 HP

The generator-set was installed in place of another generator-set for which an authority to construct was issued via A# 14131, and is located at 181 Second Avenue, San Mateo, CA 94401.

The generator set will provide emergency power (in the event of a blackout) for fire sprinkler system at the facility. This emergency engine-generator set must be periodically tested to ensure that it will generate power when needed.

EMISSIONS

Annual Emissions:

For emergency standby diesel engines, emissions are calculated based on reliability-related operation at 100% load using emission factors approved by CARB. For this application, the applicant has requested 50 hours per year for reliability-related operation. The CARB Certified emission factors for S-2 (364 HP- diesel engine, U-R-002-0393) are listed in Table 1 below:

Table (1)

Component	Emission (g/kW-hr)
NOx + POC	3.9
CO	3.3
PM_{10}	0.15
SO_2	0.247

**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.*
SO_2 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.05% S) (454 g/lb) = 0.184 g/hp-hr

In accordance with District policy, 95% and 5% of the combined emission factor of NOx + POC are assumed to be NOx and POC, respectively. Hence, the NOx and POC emission factors are 3.7 and 0.195 g/kW-hr, respectively.

Component		g/kW-hr	hp	kW/hp	hr/yr	lb/g		lb/yr		TPY
NOx	=	3.700	364	0.7457	50	0.0022046	=	110.70	=	0.055
CO	=	3.300	364	0.7457	50	0.0022046	=	98.74	=	0.049
POC	=	0.195	364	0.7457	50	0.0022046	=	5.83	=	0.003
PM10	=	0.150	364	0.7457	50	0.0022046	=	4.49	=	0.002
SO2	=	0.247	364	0.7457	50	0.0022046	=	7.39	=	0.004

Maximum Daily Emissions:

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

POLLUTANT		g/kW-hr	hp	kW/hp	hr/day	lb/g		lb/day
NOx	=	3.700	364	0.7457	24	0.0022046	=	53
CO	=	3.300	364	0.7457	24	0.0022046	=	47
POC	=	0.195	364	0.7457	24	0.0022046	=	3
PM10	=	0.150	364	0.7457	24	0.0022046	=	2
SO2	=	0.247	364	0.7457	24	0.0022046	=	4

Plant Cumulative Increase: (tons/year)

POLLUTANT	Existing	New	Total
NOx	0	0.055	0.055
CO	0	0.049	0.049
POC	0	0.003	0.003
PM10	0	0.002	0.002
SO2	0	0.004	0.004

Toxic Risk Screening:

The toxic emission of diesel particulate does exceed the District Risk Screening Trigger, as shown in Table (2) below. A Risk Screening Analysis has been performed.

Table (2)

Source	PM_{10} Emission Factor (g/bHP-hr)	HP	Annual Usage (Hours/year)	Diesel Exhaust Particulate Emissions (lb/year)	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.110	364	50	4.41	0.58	YES

Since the engine meets Best Available Control Technology for Toxics (TBACT) requirements (emission level of 0.15 g/hp-hr or less), the maximum acceptable cancer risk is 10 in a million. Results from the health risk screening analysis show that for 50 hours of operation per year, excluding periods when operation is required due to

emergency conditions, the risks to the maximally exposed nearest worker receptor and resident receptor are 3.7 in a million and 4.5 in a million, respectively. The analysis was performed at a PM_{10} emission of 4.41 lb/year. In accordance with the District's Regulation 2, Rule 5, this risk level is considered acceptable.

The ISCST3 air dispersion computer model was used to estimate annual average ambient air concentrations. Stack and building parameters for the analysis were based on information provided by the applicant. Estimates of residential risk assume potential exposure to annual average TAC concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimate for an offsite worker assumes potential exposure occurs 8 hours per day, 245 day per year, for 40 years. Since the engine is not allowed to be operated for reliability-related purposes between 7:30 a.m. and 3:30 p.m. on days when the school is in session, potential exposure to students is considered negligible. (Note that this operating restriction is from the Stationary Diesel Engine Air Toxics Control Measure discussed below.)

The manufacturer supplied ISO 8178-D2 test cycle data to CARB. The CARB staff has determined that the Cummins engine model listed above is in compliance with the PM emission requirements of less than or equal to 0.15g/bhp-hr from the California Code of Regulations Title 17, Section 93115 (e)(2)(A) 3., Table 1: Summary of the Emission Standards and Operating Requirements for New Stationary Emergency Standby Diesel-Fueled CI Engines > 50 BHP. Therefore, the above Cummins engine model qualifies for use in California for standby generator set applications operating at 50 hours per year for maintenance and testing.

STATEMENT OF COMPLIANCE

S-2 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"). S-2 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO2 limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is expected since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, S-2 is subject to Regulation 6, Rule 1 ("Particulate Matter, General Requirements"). This engine is not expected to produce visible emissions or fallout in violation of this regulation and they will be assumed to be in compliance with Regulation 6, Rule 1 pending a regular inspection.

This diesel engine is subject to the Stationary Diesel Engine Air Toxics Control Measure (ATCM) and is considered a new stationary emergency standby diesel engine since it was installed after January 1, 2005 and is larger than 50 HP. The requirements of the ATCM are included in standard permit condition 22850 (for an emergency standby diesel engine located within 500 feet of a school and allowed 50 hours of operation per year for testing and maintenance).

This application is considered to be ministerial under the District's proposed CEQA guidelines (Regulation 2-1-312) 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 a K-12 school, St. Matthew's Episcopal Day School, and is therefore subject to the public notification requirements of Reg. 2-1-412. A public notice was distributed on to the parents and guardians of the school identified above and all addresses within 1000 feet of the source. The comment period ended and comments were received. The comments and District responses are summarized below:

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, NOx, CO, SO_2 or PM_{10}.

Based on the emission calculations above, the generator set, S-2 is subject to BACT for the following pollutants: NOx & CO. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Document 96.1.3 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet the BACT 2 limits presented below.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Best Available Control Technology (BACT) Guideline
Source Category

Source:	**IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump**	**Revision:**	**6**
		Document #:	**96.1.3**
Class:	**> 50 BHP Output**	**Date:**	**04/13/2009**

Determination

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Archived in Practice	TYPICAL TECHNOLOGY
NOx	1. n/s[d] 2. Current tier[a,b] standard for NOx at applicable horsepower rating.	1. n/s[d] 2. Any engine certified or verified to achieve the applicable standard.[a,b]

CO	1. n/s[d] 2. The more stringent of either 2.75 g/bhp-hr [319 ppmvd @ 15% O_2][c or the current Tiera,b standard.	1. n/s[d] 2. Any engine certified or verified to achieve the applicable standard.
PM_{10}	1. n/s[d] 2. More stringent of either 0.15 g/bhp-hr or the current Tier standard. 3. TBACT: The more stringent of either 0.15 g/bhp-hr or the current Tier standard.	1. n/s[d] 2. Any engine or technology demonstrated, certified or verified to achieve the applicable standard. 3. Any engine or technology demonstrated, certified or verified to achieve the applicable standard.

References

a. Current tier standard (listed on reverse side): The current CARB or EPA off-road tier standard for the pollutant of concern within the appropriate horsepower range. Where NMHC + NOx is listed (with no individual standards for NOx or NMHC) as the standard, the portions may be considered 95% NOx and 5% NMHC. For the purposes of determining BACT NMHC = POC. Any engine which has been certified or demonstrated to meet the current year tier standard may be considered a current certified engine for that pollutant.

b. For pollutants NOx, POC and CO, an engine which does not meet the current EPA or CARB off-road tier standard may represent BACT2, providing 1) the engine met the most stringent EPA Tier Standard in effect at the time of installation (Tier 1 minimum) or 2) the engine met the most stringent EPA Tier Standard in effect prior to the Tier change for that horsepower rating with the permit application submitted within 6 months of the effective date of the Tier change. [Source: California Health & Safety Code Section 93116.3(b)(7)]

c. Previous BACT determination dated 01/11/02.

d. Cost effectiveness analysis must be based on lesser of 50 hr/yr or as limited by toxic risk screen.

S-2 is determined to be in compliance with the BACT 2 limits for NOx & CO.

Since CARB certification data was used to establish the NOx & CO emission factors, the BACT 2 emission limits have not been incorporated into the permit conditions and are assumed to be complied with through the design standards demonstrated by the CARB certification testing.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Application 19867;
Plant 17604; Downtown Properties V, LLC

Conditions for S-2 Emergency Standby Diesel Engine: Make: Cummins; Model: QSL9-G@-NR3; Rated Horsepower: 364 HP

Permit Condition Number 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)]

RECOMMENDATION

Issue a Permit to Operate to Downtown Properties V, LLC for the following source:

S-2 Emergency Standby Diesel Engine-Generator Set (for fire sprinkler system), Cummins; Model: QSL9-G2-NR3/2007; Rated Horsepower 364 HP

By:_____ Date: 4/23/09

Dharam Singh, PE
Air Quality Engineer