

DRAFT
ENGINEERING EVALUATION
BRISTOL-MYERS SQUIBB
PLANT 20897
APPLICATION 27115

BACKGROUND

Bristol-Myers Squibb is applying for an Authority to Construct and/or Permit to Operate a new emergency standby generator.

S-2 Emergency Standby Generator Set: Diesel Engine, Make Cummins, Model QSK50-G4 NR2, Model Year 2015, Rated 2220 BHP; Abated by A-2, Diesel Particulate Filter: Rypos, HDPF/C, RH408-XL-C

According to the California Air Resources Board Executive Order DE-07-001-05, A-2 is a Level 3 device with no less than 85% reduction for diesel engines on stationary emergency standby generators.

The engine will be within 1000 feet of the property boundary of Hoover Elementary School, so it is subject to the public notice requirements in the District Regulation 2-1-412.

EMISSIONS SUMMARY

Annual Emissions:

Basis:

- 2220 brake horsepower (bhp) output rating for full-load, standby operation for each engine
- 50 hours/year/engine operation for reliability-related activities
- The engine of S-2 has an EPA Engine Family Name FCEXL050.AAD, and is certified to meet the EPA Tier 2. Emission factors were calculated using the manufacturer's emission testing data submitted to EPA for certification.
- 85% reduction is assumed for the PM emissions according to the CARB Executive Order DE-07-001-05.

Pollutant	Emission Factor (g/bhp-hr)
NO _x	4.44
CO	0.89
POC	0.14
PM ₁₀	0.01

- 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, which is based on full conversion of

fuel sulfur to SO₂ 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):

SO₂: 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.0015% S) (454 g/lb) = 0.0055 g/hp-hr

NO _x	=	(	4.44	g/hp-hr)	(	2220	hp)	(	50	hr/yr)	(lb/454g)	=	1084.81	lb/yr	=	0.542	TPY
CO	=	(	0.89	g/hp-hr)	(	2220	hp)	(	50	hr/yr)	(lb/454g)	=	218.79	lb/yr	=	0.109	TPY
POC	=	(	0.14	g/hp-hr)	(	2220	hp)	(	50	hr/yr)	(lb/454g)	=	34.64	lb/yr	=	0.017	TPY
PM ₁₀	=	(	0.01	g/hp-hr)	(	2220	hp)	(	50	hr/yr)	(lb/454g)	=	2.19	lb/yr	=	0.001	TPY
SO ₂	=	(	0.0055	g/hp-hr)	(	2220	hp)	(	50	hr/yr)	(lb/454g)	=	1.3447	lb/yr	=	0.001	TPY

Maximum Daily Emissions:

Daily emissions are calculated to establish whether a source triggers the requirement for Best Available Control Technology (10 lb/highest day total source emissions for any class of pollutants). A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

NO _x	=	(	4.44	g/hp-hr)	(	2220	hp)	(	24.00	hr/day)	(lb/454g)	=	520.71	lb/day
CO	=	(	0.89	g/hp-hr)	(	2220	hp)	(	24.00	hr/day)	(lb/454g)	=	105.02	lb/day
POC	=	(	0.14	g/hp-hr)	(	2220	hp)	(	24.00	hr/day)	(lb/454g)	=	16.63	lb/day
PM ₁₀	=	(	0.01	g/hp-hr)	(	2220	hp)	(	24.00	hr/day)	(lb/454g)	=	1.05	lb/day
SO ₂	=	(	0.0055	g/hp-hr)	(	2220	hp)	(	24.00	hr/day)	(lb/454g)	=	0.65	lb/day

PLANT CUMULATIVE INCREASE (tons/year, post 4/5/1991)

Pollutant	Current	Application Increase	New Total
NO _x	0.324	0.542	0.866
CO	0.057	0.109	0.166
POC	0.015	0.017	0.032
PM ₁₀	0.001	0.001	0.002
SO ₂	0.010	0.001	0.011

HEALTH RISK SCREENING ANALYSIS (HRSA)

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

Source	PM ₁₀ Emission Factor (g/bhp-hr)	HP	Annual Usage (Hours/year)	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)
S-2	0.01	2220	50	2.19	0.34

As determined using the District's HRSA Streamlining Policy Checklist for Stationary Emergency Standby and Fire Pump Diesel Engines, this application qualifies for the District's May 6, 2015 HRSA Streamlining Policy for Stationary Diesel-Fired IC Engines Used for Backup Power or Fire Pumps. Based on this policy, the District has determined that this project will comply with District TBACT requirements and will result in health impacts of less than 10 in a million cancer risk and less than 1.0 chronic hazard index based on conservative HRSA screening procedures. Therefore, this project will comply with Regulation 2, Rule 5, Section 301 and 302. A refined HRSA is not required for this application.

STATEMENT OF COMPLIANCE

The owner/operator of S-2 shall comply with Regulation 6-1 (Particulate Matter and Visible Emissions Standards) and Regulation 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). Since the engine meets TBACT for PM₁₀ ($= < 0.15$ g/hp-hr), it is expected to comply with Regulation 6-1. Ultra-low sulfur diesel (15 PPM sulfur) will be used to meet the sulfur limitation of 0.5wt% in Regulation 9-1-304 as well as to minimize PM₁₀ emissions. Because S-2 is an emergency standby generator, 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 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 therefore is not discretionary as defined by CEQA.

The project is within 1000 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 Hoover Elementary School, 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_x, CO, SO₂ or PM₁₀.

Based on the emission calculations above, the owner/operator of S-2 is subject to BACT for NO_x, CO, and POC. The District's BACT requirements for "IC Engine - Compression Ignition: Stationary Emergency > 50 bhp" are addressed in the BACT Guideline, document # 96.1.3, revision 7, dated December 22, 2010. The BACT2 requirements are 4.8 g/bhp-hr for NMHC+NO_x and 2.6 g/bhp-hr for CO for engines with maximum power greater than 750 HP. According to the emission data in the EPA database for the engine family that S-2 belong to, S-2 meets the BACT2 requirements.

Offsets:

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_x. Since the facility's permitted emissions are less than 10 tons per year of POC or NO_x, offset is not required.

New Source Performance Standards (NSPS):

The engine is subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

The engine has a total displacement of 50 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 60.4205(b) requires these engines to comply with the standards in Section 60.4202 that apply to the same model year and maximum engine power. For engines above 50 hp, below 3000 hp, and that have a displacement less than 10 liters per cylinder, the requirement is to comply with the certification standards in 40 CFR 89.112 and 89.113 for all pollutants.

For engines greater than 560 kW, the standards in Section 89.112 are:

- NMHC + NO_x: 6.4 g/kW-hr
- CO: 2.6 g/kW-hr
- PM: 0.15 g/kW-hr

Section 89.113 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 engine will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because the facility is limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

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-2 will be subject to Permit Condition Numbers 22850 and 24354 as shown below.

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 93115.6 (b)(3)(A)(1)(a)]
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 93115.6 (b)(3)(A)(1)(a)]

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 93115.10 (e)(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 93115.10 (g) (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 93115.6 (b)(2)]

Permit Condition Number 24354

1. The owner/operator shall abate the particulate emissions from the emergency diesel engine with a Diesel Particulate Filter at all times the engine is in operation.

[Basis: "ATCM for Stationary Compression Ignition Engines" Section 93115.6(a)(3) or 93115.6(b)(3), title 17, CA Code of Regulations]

2. The owner/operator shall install and maintain a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. The owner/operator shall maintain records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached 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).

[Basis: "ATCM for Stationary Compression Ignition Engines" Section 93115.10(e), title 17, CA Code of Regulations; 40 CFR 60.4214c]

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 Authorities 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 2-1-412.6. 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 Authorities to Construct for the following source:

S-2 Emergency Standby Generator Set: Diesel Engine, Make Cummins, Model QSK50-G4 NR2, Model Year 2015, Rated 2220 BHP; Abated by A-2, Diesel Particulate Filter: Rypos, HDPF/C, RH408-XL-C

By: _____

Xuna Cai
Senior Air Quality Engineer

Date: _____