DRAFT ENGINEERING EVALUATION

Facility ID No. 21612
City and County of San Francisco
49 South Van Ness, San Francisco, CA 94103
Application No. 29474

Background

City and County of San Francisco is applying for an Authority to Construct and/or a Permit to Operate for the following equipment:

S-5 Emergency Standby Diesel Generator Set
Make: Cummins/CEX, Model: QSK60-G6 NR2, Model Year: 2018
2922 bhp, 19.36 MMBtu/hr
Permit Condition No. 22850

The criteria pollutants are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter equal to 10 microns or less (PM_{10}), and particulate matter with an aerodynamic diameter equal to 2.5 microns or less ($PM_{2.5}$). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

S-5 meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 2 Off-road standard. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

This evaluation report will discuss compliance of the proposed project with all applicable rules and regulations.

Emissions

Table 1. Emissions from EPA/CARB Certified Data for S-5

Pollutant	Emission Factor (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NOx	3.61	557.6	1161.7	0.581
POC	0.19	29.3	61.1	0.031
CO	0.70	108.1	225.3	0.113
PM_{10}	0.09	13.9	29.0	0.014
$PM_{2.5}$	0.09	13.9	29.0	0.014
SO_2	0.0055	0.9	1.8	0.001

Basis:

- Emission factors provided by the EPA/CARB Manufacturer's Emission Factors Datasheet under engine family JCEXL060.AAD
- Annual emissions: Reliability-related activity 50 hours for S-5
- Max daily emissions: 24-hour operation
- SO_2 emission factor from AP-42 Table 3.4-1, SO_2 at 15 ppm = 0.00809*0.0015% lb SO_2/hp-hr = 0.0000121 lb SO_2/hp-hr (454g/lb) = 0.0055g/hp-hr.
- $PM_{2.5}$ will be assumed to be equal to PM_{10}.

Plant Cumulative Increase

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

Table 2. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NOx	0.000	0.581	0.581
POC	0.000	0.031	0.031
CO	0.000	0.113	0.113
PM_{10}	0.000	0.014	0.014
$PM_{2.5}$	0.000	0.014	0.014
SO_2	0.000	0.001	0.001

Health Risk Assessment (HRA)

At a maximum rate of 29 lbs/year, the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year. All PM_{10}/$PM_{2.5}$ emissions are considered diesel particulate emissions. There were no other related projects permitted in the last three years.

Based on 50 hours/year of operation, this project passed the HRA conducted on October 24th, 2018 by the District's Permitting, Title V & Toxics Section. Results from the HRA indicate that the maximum project cancer risk is estimated at 3.3 in a million and the maximum project chronic hazard index is estimated at 0.00087. In accordance with Regulation 2, Rule 5, this source is in compliance with the TBACT and project risk requirements.

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, NOx, CO, SO_2, PM_{10}, or $PM_{2.5}$.

BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 7. dated 12/22/2010. For NOx, CO, POC and PM_{10}, BACT(2) is the CARB ATCM standard for the respective pollutant at the applicable horsepower rating. For SO_2, BACT(2) is using fuel with sulfur content not to exceed 0.0015%, or 15 ppm. The more restrictive BACT(1) standards are not applicable to this engine because it will be limited to operation as an emergency standby engine.

S-5 satisfies the current BACT(2) standards for the following pollutants which exceed 10 lb/day in Table 1:

Pollutant	**Emission Factor**	**BACT(2) Standard**
NOx	3.61 g/bhp-hr	4.56 g/bhp-hr
NMHC	0.19 g/bhp-hr	0.24 g/bhp-hr
CO	0.70 g/bhp-hr	2.60 g/bhp-hr
PM10	0.09 g/bhp-hr	0.15 g/bhp-hr

Offsets

Since the facility permitted emissions levels are below the offset triggers levels specified per Sections 2-2-302 for POC and NOx and 2-2-303 for $PM_{2.5}$, PM_{10}, and sulfur dioxide offsets are not required.

Statement of Compliance

The owner/operator of S-5 shall comply with Regulation 6-1 (Particulate Matter and Visible Emissions Standards), Regulation 9-1 (Inorganic Gaseous Pollutants: Sulfur Dioxide), and Regulation 9-8 (Inorganic Gaseous Pollutants: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines).

Regulation 6-1-303 (Ringelmann No.2 Limitation) limits opacity from internal combustion engines to Ringelmann No. 2. Regulation 6-1-305 (Visible Particles) prohibit emission of emission particles large enough to be visible as individually at the emission point. Regulation 6-1-310 (Particle Weight Limitation) limits emissions from any source particulate in excess of 343 mg per dry standard cubic meter. S-5 will be fueled using ultra-low sulfur diesel. Thus, the engine is expected to comply with Regulation 6-1.

Regulation 9-1-301 (Limitations on Ground Level Concentrations) prohibits emissions from any sources other than ships, SO_2 in quantities which result in ground level concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes or 0.05 ppm averaged over 24 hours. Ultra-low

sulfur diesel (15 PPM sulfur) will be used to meet the sulfur limitation of 0.5 wt% in Regulation 9-1-304 (Fuel Burning) as well as to minimize SO_2 emissions to comply with Regulation 9-1-301. Thus, S-5 is expected to comply with Regulation 9-1.

Because S-5 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 (Emergency Standby engines, Hours of Operation) and 530 (Emergency Standby and Low Usage Engines, Monitoring and Recordkeeping) will be included in the permit conditions. Thus, S-5 is expected to comply with Regulation 9-8.

S-5 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 bhp. The engine must comply with the emissions standards set forth in Table 1 of § 93115.6.

For engines above 750 hp, the standards in Table 1 are:

- NMHC + NO_x: 4.8 g/bhp-hr
- CO: 2.6 g/bhp-hr
- PM: 0.15 g/bhp-hr

Based on the emission factors provided by the manufacturer, S-5 complies with these emission standards. The requirements of the ATCM will be included in the permit conditions.

The project is considered to be ministerial under the District's California Environmental Quality Act (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 located within 1000 feet from the nearest school and therefore is subject to the public notification requirements of Reg. 2-1-412.

Prevention of Significant Deterioration (PSD)
This application will not trigger PSD as defined in Regulation 2-2 since it is not a major facility.

School Notification (Regulation 2-1-412)

This project is located within 1,000 feet from the nearest K-12 school and therefore is subject to the public notification requirements of Regulation 2-1-412.

Permit Conditions

Permit Condition #22850 for S-5

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

End of Conditions

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 an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. 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 an Authority to Construct/Permit to Operate for the following source:

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