ENGINEERING EVALUATION

Pacific Oak SOR II Oakland City Center
505 14th Street,
Oakland, CA 94612
Facility ID: 24068
Application No. 682732

Background

Pacific Oak SOR II Oakland City Center is applying for an Authority to Construct/Permit to Operate for the following equipment:

S-6 Emergency Standby Diesel Fire Pump
Make: Cummins, Model: CFP5E-F30, Model Year: 2023
129 bhp, 1.00 MMBtu/hr

The Diesel Fire Pump will be used for emergency water pumping for fire suppression system which is critical facility/life safety system for Pacific Oak SOR II Oakland City Center. The Diesel Fire pump will be able to operate unrestricted during emergency use events. The engine will be limited to a maximum of 50 hours per year for maintenance and testing. The criteria pollutants associated with the source are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC), sulfur dioxide (SO_2), and particulate matter (PM).

S-6 meets the Environmental Protection Agency (EPA NSPS) Tier 3 Off-road standard and NSPS Stationary (40 CFR Part 60 Sub Part IIII). 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

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-6
- Max daily emissions: 24-hour operation
- SO_2 emission factor from AP-42 Table 3.4-1,

$$SO_2 \text{Emission Factor } \left(\frac{\text{g of } SO_2}{\text{bhp} - \text{hr}}\right) = \left[\{8.09 * 10^{-3} * 0.0015\} \frac{\text{lb}}{\text{bhp} - \text{hr}}\right] * 454 \frac{\text{g}}{\text{lb}}$$
$$= 0.006 \frac{\text{g of } SO_2}{\text{bhp} - \text{hr}}$$

- Assume $PM_{2.5}$ emission factor is equal to PM_{10} emission factor

Table 1. Annual and Daily Emissions from EPA/CARB Certified Data from S-6

Pollutant	Emission Factor (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NOx	2.54	17.3	36.1	0.018
POC	0.06	0.4	0.9	0.0005
CO	0.69	4.7	9.9	0.005
PM_{10}	0.09	0.6	1.3	0.001
$PM_{2.5}$	0.09	0.6	1.3	0.001
SO_2	0.006	0.04	0.08	0.00004

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) from NPS	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NOx	0	0.018	0.018
POC	0	0.0005	0.0005
CO	0	0.005	0.005
PM_{10}	0	0.001	0.001
$PM_{2.5}$	0	0.001	0.001
SO_2	0	0.00004	0.00004

Health Risk Assessment (HRA)

At a maximum rate of 1.3 lb/year, the diesel particulate emissions (PM_{10}) from the project are greater than the toxic trigger level of 0.26 lb/year. All PM_{10} emissions are considered diesel particulate emissions. There were no other related projects permitted in the last five years.

Using the EPA certified PM emission factor for the engine, a 50 hours per year limit for reliability-related activities, and assuming PM is in the form of diesel exhaust PM, the following annual emission rate for diesel exhaust PM was calculated.

$$\frac{0.09\ \cancel{g}\ PM}{\cancel{hp}-\cancel{hr}} \times 129\ \cancel{hp} \times \frac{lb}{454\ \cancel{g}} \times \frac{50\cancel{hr}}{yr} = 1.3\ lb\ PM/yr$$

Pursuant to Regulation 2-5-110, the application is subject to the provisions of the rule since the increase in diesel exhaust PM emissions from the project is above the trigger level listed in Table 2-5-1 of the regulation 2-5-110 (0.26 lb/yr).

S-6 is subject to the District's HRA streamlining policy for stationary diesel-fuel combustion engines used for backup power or fire pumps. The HRA streamlining policy checklist shows that a refined HRA is required for this permit application. The project is presumed to be in compliance with project risk requirements as recommended, limiting reliability-related activity hours by permit condition.

HRA Result
The HRA estimates the health risk resulting from toxic air contaminant (TAC) emissions from the non-emergency operation of a new Standby Generator Diesel Engine (S-6) at this site. Results from the HRA indicate that the project cancer risk is **0.18 in a million** and the project chronic hazard index (HI) is **0.00014.** In accordance with District Regulation 2-5-301, the proposed new source does not require TBACT because the estimated source risk is less than a cancer risk of 1.0 in a million and/or a chronic HI of 0.20. Since the estimated project cancer risk does not exceed 6.0 in a million and hazard indices do not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements, for projects located within an Overburdened Community as defined in Regulation 2-1-243. This HRA represents an analysis of all sources of TACs at this facility. Therefore, these project HRA results also represent site-wide HRA results for purposes of the Air Toxics "Hot Spots" Act (AB 2588).

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 $PM_{2.5}$

Based on the emission calculations above, the owner/operator of S-6 is subject to BACT for the following pollutant: NOx. The BACT/TBACT Workbook does not address direct-drive emergency standby fire pump engines. Since CARB Stationary Diesel ATCM requirements are at least as stringent as current BACT determinations and applicable NSPS, it is proposed that BACT for direct-drive emergency standby fire pump engines be compliance with the CARB Stationary Diesel ATCM, Title 17, California Code of Regulation section 93115.6(4), New Direct-Drive Emergency Standby Fire Pump Engines.

This engine complies with the proposed BACT.

Table 3. Emission Standard for New Stationary Emergency Standby Diesel- Fueled CI Engines g/bhp-hr (g/kW-hr)

CARB, Title 17 ATCM, California Code of Regulations Section 93115.6				
Maximum Engine Power	Models Year(s)	NOx	PM	CO
$100 \leq HP \leq 175$	2008 and earlier 2009+	2.85 g/bhp-hr	0.15 g/bhp-hr	2.6 g/hp-hr

Offsets

In accordance with the Air District's Policy for Calculating Potential to Emit (PTE) for Emergency Backup Power Generators, the Potential to Emit for S-6 was estimated assuming 150 hours of operation per year (50 hours per year for reliability-related and testing operation + 100 hours per year for emergency operation) as shown in Table 4.

Basis for PTE calculation:

- S-3 Emergency Diesel Gen Set and S-4 Diesel Fire Pump are LOE engines and Emission Factors are from AP 42, Chapter 3.3.1, Table 3.3-1
- Operating hours of 150 hours is used for calculating PTE for S-6
- Average yearly usage for LOE engines are 120 hour per year
- There are two LOE sources currently at the facility:
  1. S-3 Emergency Diesel Gen Set, 180 bhp
  2. S-4 Emergency Diesel Fire Pump, 130 bhp
- Total of 3 sources including the new emergency fire pump engine S-6

Table 4. PTE from all active source at the facility

Pollutant	PTE from sources at the facility	Current application	Total
	(tons/year)	tons/year	tons/year
NO_x	0.577	0.054	0.631
POC	0.046	0.001	0.047
CO	0.124	0.015	0.139
PM_{10}	0.041	0.002	0.043
$PM_{2.5}$	0.041	0.002	0.043
SO_2	0.038	0.0001	0.038

Note: Please see detailed Excel Spreadsheet calculation for A/N 682732

The facility has potential to emit less than 10 tons per year of NO_X and POC, and less than 100 tons per year of $PM_{2.5}$, PM_{10}, and SO_2. Since the facility permitted levels are below the offset trigger levels specified in Regulation 2-2, offsets are not required.

Statement of Compliance

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

Airborne Toxic Control Measure for Stationary Compression Ignition Engines
ATCM, 5/19/2011, section 93115, title 17, CA Code of Regulations

District Rules
Regulation 6-1-303 (*Ringelmann No. 2 Limitation*)
Regulation 9-1-301 (*Limitations on Ground Level Concentrations of SO_2*)
Regulation 9-8 (*NOx and CO from Stationary Internal Combustion Engines*)
Section 9-8-110.5 – Limited exemption for emergency standby engines
Section 9-8-330 – Hours of operation for emergency standby engines
Section 9-8-502 – Recordkeeping

California Environmental Quality Act (CEQA)
This project is ministerial under the District Regulation 2-1-311 (Permit Handbook Chapter 2.3), and is therefore not subject to CEQA review.

New Source Performance Standards (NSPS)
40 CFR 60, Subpart IIII (*Stationary Compression Ignition Internal Combustion Engines*)

National Emissions Standards for Hazardous Air Pollutants (NESHAP)
40 CFR 63, Subpart ZZZZ (*Stationary Reciprocating Internal Combustion Engines (RICE)*)

Prevention of Significant Deterioration (PSD)
This application is not part of a PSD project as defined in Regulation 2-2.

School Notification (Regulation 2-1-412)
This project is over 1,000 feet from the nearest K-12 school and is therefore not subject to the public notification requirements.

Overburdened Community
This project is located within the Overburdened Community (OBC) as defined in Regulation 2-1-243 and is therefore subject to the public notification requirements.

Result from OBC Public Notice
XXXXXXX

Permit Conditions

Condition 100072
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1. The owner or 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]

2. 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]
3. 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]
4. 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 or 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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

Permit Condition No.100073

The owner/operator shall not exceed the following limits per year per engine for reliability-related activities:

50 Hours of Diesel fuel (Diesel fuel)

[Basis: Cumulative Increase; Regulation 2-5; Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

End of Conditions

Recommendation

The Air District has evaluated the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable District, state, and federal air quality-related regulations, including the health risks resulting from toxic air contaminant emissions. The preliminary recommendation is to issue a permit for this project. After considering all comments received, the District will make a final determination.

Recommend that the Air District initiate the public comment period and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

S-6 Emergency Standby Diesel Fire Pump
Make: Cummins, Model: CFP5E-F30, Model Year: 2023
129 bhp, 1.00 MMBtu/hr

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