DRAFT ENGINEERING EVALUATION

Facility ID No. 15465
Kaiser Permanente – Regional Lab Annex
914 Marina Way South, Richmond, CA 94804-4804
Application No. 31232

Background

Kaiser Permanente – Regional Lab Annex is applying for an Authority to Construct/Permit to Operate for the following equipment:

S-2 Emergency Standby Diesel Generator Set
Make: Caterpillar Inc., Model: C15,
Year: 2021, 787 bhp, 4.96 MMBtu/hr, abated by A-1
Permit Condition Nos. 22850

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

S-2 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. Annual and Daily Emissions from EPA/CARB Certified Data from S-2

Pollutant	Emission Factor (g/BHP-hr)	Maximum Daily Emissions (lb/day)	Emission (lb/yr)	Emission (TPY)
NOx	4.00	166.41	347.01	0.174
POC	0.07	2.91	6.07	0.003
CO	1.19	49.51	103.24	0.052
[1]$PM_{10/2.5}$	0.07	2.91	6.07	0.003
[2]SO2	N/A[2]	0.23	0.48	0.000

Basis:
- Annual emissions: Reliability-related activity 50 hours for S-2
- Max daily emissions: 24-hour operation
- Emissions are from EPA Engine Family MCPXL15.2NZS for S-2.
- [1] Conservative Assumption: All PM emissions are PM2.5

- [2] SO_2 emission factor from AP-42 Table 3.4-1, SO_2 (15 ppm) = 0.00809*0.0015 lb SO_2/bhp-hr

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	0.266	0.174	0.440
POC	0.014	0.003	0.017
CO	0.021	0.052	0.073
$PM_{10}/PM_{2.5}$	0.006	0.003	0.009
SO_2	0.009	0.000	0.009

Health Risk Assessment (HRA)

All PM_{10} emissions are considered diesel particulate emissions. The PM_{10} emissions from this application are summarized in Table 1. There are no related project permitted in the last three years. Since the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year, an HRA is required. The source is within 100 ft from receptors, therefore it cannot be streamlined.

HRA Results

This analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from non-emergency operation of standby generator diesel engines at this facility. Results from the refined HRA indicate that the project cancer risk is 1.1 in a million, and the project chronic hazard index (HI) is 0.00075.

TBACT

In accordance with the District's Regulation 2-5-301, this source triggers the Best Available Control Technology for Toxic Air Contaminants (TBACT) because the estimated source cancer risk was greater than 1.0 in a million at a 50 hr/yr reliability operational limit. BACT and TBACT determinations for compression ignition engines with a rated capacity greater than 1,000 bhp are described in BAAQMD BACT/TBACT Workbook for IC Engines – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.5, Revision 0. dated 12/22/2020 (see Attachment 1). This engine complies with the TBACT guidelines because PM emissions are 0.07 g/bhp-hr which is below 0.15 g/bhp-hr.

Project Risk Limits

Since S-1 operating at 50 hours/year, complies with TBACT, and the estimated project cancer risk does not exceed 10 in a million and the chronic and acute hazard indices do not exceed 1.0, this project complies with the District's Regulation 2-5-302 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, SO2, or PM10.

BACT for S-1 is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump 50 BHP and < 1000 BHP Output, Document #96.1.3, Revision 8, dated 12/22/2020. For NOx, CO, POC and PM10, BACT(2) is the CARB ATCM standard for the respective pollutant at the applicable horsepower rating.

For SO2, 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-2 satisfies the current BACT(2) standards for the following pollutants which exceed 10 lb/day in Table 1:

S-1	**Pollutant**	**Emission Factor**	**BACT(2) Standard**
	NOx*	4.00 g/bhp-hr	4.56 g/bhp-hr
	CO	1.19 g/bhp-hr	2.60 g/bhp-hr

Basis: The standard is expressed as 4.8 g/bhp of NMHC+NOx. NOx is estimated to be 95% of the combined standard (4.8*0.95 = 4.56 g/bhp-hr)

Offsets

Offset must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NOx or POC, as specified in Regulation 2-2-302; 100 tons per year or more of PM2.5, PM10 or sulfur dioxide, as specified in Regulation 2-2- 303.

Table 3. Potential to Emit for FID 15465

Pollutant	Existing Annual Emissions (TPY)	Application Annual Emissions* (TPY)	Facility Annual Emissions (TPY) *	Offset Requirement (TPY)	Offset Required
NOx	1.596	0.521	2.117	>10	N
POC	0.084	0.009	0.093	>10	N
CO	0.126	0.155	0.281	-	N
$PM_{10}/PM_{2.5}$[1]	0.036	0.009	0.048	≥100	N
SO_2	0.054	0.001	0.055	≥100	N

Basis: Annual emissions: Reliability-related activity of 50 hours for S-2 and 20 hours for S-1. Emergency operation of 100 hours for both S-2 and S-1.

Since the facility's potential to emit is below the offsets 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.

Public Notice Requirement (Regulation 2-1-412)
The proposed source is located more than 1,000 feet from any K-12 schools, with more than 12 students enrolled. However, it is within an Overburdened Community as defined in Regulation 2-1-243 and requires a Health Risk Assessment pursuant to Regulation 2-5-401.

Therefore, the proposed source is subject to the public notification requirements of Regulation 2-1-412. A public notice was prepared and sent to all addresses within 1,000 feet of the proposed sources.

Permit Conditions

Permit Condition #22850 for S-2

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:

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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]
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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 for the equipment listed below. However, the proposed source will be located within an Overburdened Community and requires an HRA, which triggers the public notification requirements of Regulation 2-1-412. After the comments are received from the public 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 and/or a Permit to Operate for the following equipment:

S-2 Emergency Standby Diesel Generator Set
Make: Caterpillar Inc., Model: C15,
Year: 2021, 787 bhp, 4.96 MMBtu/hr, abated by A-1
Permit Condition Nos. 22850

Draft Prepared by: Isis Virrueta, AQE
March 2023

Attachment 1

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:**	**8**
		Document #:	**96.1.3**
Class:	➢ **50 BHP and < 1000 BHP Output**	**Date:**	**12/22/2020***

Determination

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC (NMHC)	1. n/s[c] 2. CARB ATCM standard[a] for POC at applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
NOx	1. n/s[c] 2. CARB ATCM standard[a] for NOx at applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
SO_2	1. n/s[c] 2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm (wt).	1. n/s[c] 2. CARB Diesel Fuel (Ultra Low Sulfur Diesel)
CO	1. n/s[c] 2. CARB ATCM standard[a] for CO at the applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
PM_{10}	1. n/s[c] 2. 0.15 g/bhp-hr 3. 0.15 g/bhp-hr	1. n/s[c] 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.
NPOC	1. n/s 2. n/s	1. n/s 2. n/s

* Applies to open permit applications with a complete date on or after 1/1/2020.

References

a.	ATCM standard (listed below): 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 compliant with the certified emission standard for that pollutant.
b.	Deleted (no longer applies).
c.	Cost- effectiveness analysis must be based on lesser of 50 hr/yr or non-emergency operation as limited by District health risk screen analysis.

Table 1: BACT 2 Emission Limits based on CARB ATCM

Emissions Standards for Stationary Emergency Standby Diesel-Fueled CI Engines ≥50 BHP g/Kw-hr (g/bhp-hr)			
Maximum Engine Power	**PM**	**NMHC+NOx**	**CO**
37 ≤ KW < 56 (50 ≤ HP < 75)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
56 ≤ KW < 75 (75 ≤ HP < 100)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
75 ≤ KW < 130 (100 ≤ HP < 175)	0.20 (0.15)	4.0 (3.0)	5.0 (3.7)
130 ≤ KW < 225 (175 ≤ HP < 300)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
225 ≤ KW < 450 (300 ≤ HP < 600)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
450 ≤ KW ≤ 560 (600 ≤ HP ≤ 750)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
560 < KW < 750 (750 < HP < 1000)	0.20 (0.15)	6.4 (4.8)	3.5 (2.6)