

DRAFT ENGINEERING EVALUATION

**Facility ID No. 25074
Emergency Operations Center
780 West Olive Avenue, Sunnyvale, CA 94086
Application No. 31404**

Background

Emergency Operations Center (EOC) is applying for an Authority to Construct/Permit to Operate for the following equipment:

**S-1 Emergency Standby Diesel Generator
Make: Cummins, Model: QSB7-G5 NR3, Model Year: 2021
324 bhp, 2.05 MMBtu/hr
Permit Condition Nos. 22850 and 23787**

Abated by

**A-1 Oxidation Catalytic Converter
Make: Johnson Matthey; Model: MC6-D-C-SS-EIEO-6/6-2**

**S-2 Emergency Standby Diesel Generator
Make: Cummins, Model: QSB7-G5 NR3, Model Year: 2021
324 bhp, 2.05 MMBtu/hr
Permit Condition Nos. 22850 and 23787**

Abated by

**A-2 Oxidation Catalytic Converter
Make: Johnson Matthey; Model: MC6-D-C-SS-EIEO-6/6-2**

The criteria pollutants are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO₂) and particulate matter (PM₁₀). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

S-1 and S-2 meet the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 3 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-1 and S-2

Pollutant	Unabated Emission Factor (g/bhp-hr)	Abated Emission Factor (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NO _x	2.88	2.88	98.66	205.53	0.103
POC	0.11	0.06	1.88	3.93	0.002
CO	0.75	0.15	5.14	10.70	0.005
PM ₁₀ /PM _{2.5} ¹	0.08	0.08	2.74	5.71	0.003
SO ₂	N/A ²	N/A ²	0.21	0.43	0.000

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-1 and S-2
- Max daily emissions: 24-hour operation
- Emissions from EPA Engine Family MCEXL0409AAD for S-1 and S-2
- ¹ Conservative Assumption: All PM emissions are PM_{2.5}
- ² SO₂ emissions calculated using emission factors from Table 3.4-1 of AP-42 assuming complete conversion of sulfur in fuel to SO₂ and a maximum sulfur content of 15 ppm

Plant Cumulative Increase

Application 31404 is part of a larger project including Application 31456. The emissions from both applications are detailed in Table 2.

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

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application 31404 Emissions (tons/yr)	Application 31456 Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NO _x	0.000	0.103	0.041	0.144
POC	0.000	0.002	0.011	0.013
CO	0.000	0.005	0.080	0.085
PM ₁₀ /PM _{2.5}	0.000	0.003	0.007	0.010
SO ₂	0.000	0.000	0.000	0.001

Health Risk Assessment (HRA)

HRA was required. The diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year. All PM₁₀ emissions are considered diesel particulate emissions. The PM₁₀ emissions from this application are summarized in Table 1. Per correspondences with the manufacturer, ammonia slip is a potential effect of an SCR catalyst system, not a basic oxidation catalyst. There is no urea injection and therefore no chance for the formation of ammonia. There is a related application in the project, AN 31456. Since the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year, an HRA is required.

As determined using the District’s HRSA Streamlining Policy Checklist for Stationary Emergency Standby and Fire Pump Diesel Engines, this application does not qualify for the District’s May 6, 2015 HRSA Streamlining Policy for Stationary Diesel-Fired IC Engines Used for Backup Power or Fire Pumps. Therefore, a refined HRA is required for this application to verify compliance with Regulation 2, Rule 5, Sections 301 and 302.

The project is in compliance with project risk requirements as recommended, limiting reliability-related activity hours by permit condition. See HRA report.

HRA Results

This analysis estimates the incremental health risk resulting from TAC emissions from non-emergency operation of a standby generator diesel engine at this facility. Results from this HRA indicate that the maximum project cancer risk is estimated at 4.2 in a million, and the maximum project chronic hazard index is estimated at 0.0032. The maximum acute hazard index is 0.0024. See HRA Report for more details.

Table 3. Risk Screening Results: Project

Maximally Exposed Receptor	Maximum Cancer Risk	Maximum Chronic Hazard Index
Resident	3.0 chances in a million	0.00082
Worker	4.2 chances in a million	0.0032
School	0.30 chances in a million	0.0011

Table 4. Cancer Risk by Source

Source	Resident	Worker
S-1	1.6	1.4
S-2	1.4	2.8
S-3	0.053	0.018

TBACT

In accordance with the District’s Regulation 2-5-301, S-1 and S-2 require TBACT because each estimated source risk is a cancer risk greater than 1.0 in a million, and/or a chronic hazard index greater than 0.20. BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 8 dated 12/22/2020 contains TBACT requirements for S-1 and S-2. TBACT compliance for S-1 and S-2 is confirmed in Table 5 below. This project complies with the District’s Regulation 2-5-302 project risk requirements.

TBACT	Emission Limits (CARB ATCM)	S-1/S-2 Emissions (Abated)	Satisfies TBACT?
Pollutant	g/bhp-hour	g/bhp-hour	
PM10	0.15	0.08	YES

Project Risk Limits

Since the proposed engine, operating at 50 hours/year for reliability related testing, complies with TBACT, and the estimated project cancer risk does not exceed 10 in a million and the chronic hazard index does not exceed 1.0, this project complies with the District’s Regulation 2-5-302 project risk requirements. No additional operating hour restrictions were necessary for this project.

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/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 8 dated 12/22/2020 contains BACT requirements for S-1 and S-2. For NOx and CO, BACT(2) is the CARB ATCM standard at the applicable horsepower rating. The more restrictive BACT(1) standard are not applicable to S-1 or S-2 because they will be limited to operate as an emergency standby engine.

Both S-1 and S-2 have been certified (EPA Certificate #MCEXL0409AAD-019) to meet the current Tier 3 standard. It can be seen below that S-1 and S-2 both comply with the BACT(2) standard for NOx + NMHC.

Pollutant	Emission Factor	BACT(2) Standard
NOx + NMHC	2.99 g/bhp-hr	3.0 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.

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 SO₂*)
Regulation 9-8 (*NO_x 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)

Because this equipment will be located within 1,000 feet of Little Tree Montessori International School (2603 Tassajara Ave, El Cerrito, CA 94530) the project is subject to the public notification requirements of Regulation 2-1-412 due to the increase in emissions from the project.

A public notice will be sent to all parents of students of the above mentioned school(s) and all residents within 1,000 feet of the facility. There will be a 30-day public comment period.

Permit Conditions

Permit Condition 22850 for S-1 and 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:

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

Permit Condition 27416 for S-1 and S-2

1. The owner/operator shall abate the particulate emissions from the emergency diesel engine by the Diesel Oxidation Catalyst at all times the engine is in operation.
[Basis: Toxics]

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 at least one 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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A-2 Oxidation Catalytic Converter
Make: Johnson Matthey; Model: MC6-D-C-SS-EIEO-6/6-2

Prepared By: Eric Grulke, Air Quality Engineer I

Attachment 1

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Best Available Control Technology (BACT) Guideline
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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
SO₂	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
PM₁₀	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 \leq KW < 56 (50 < HP < 75)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
56 \leq KW < 75 (75 \leq HP < 100)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
75 \leq KW < 130 (100 < HP < 175)	0.20 (0.15)	4.0 (3.0)	5.0 (3.7)
130 \leq KW < 225 (175 \leq HP < 300)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
225 \leq KW < 450 (300 < HP < 600)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
450 \leq KW \leq 560 (600 \leq HP \leq 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)