

ENGINEERING EVALUATION

Facility ID No. 202597
Marina Village Parkway Pump Station- 713 Marina Village PKWY
713 Marina Village Parkway, Alameda, CA 94501
Application No. 653660

Background

Marina Village Parkway Pump Station- 713 Marina Village PKWY is applying for an Authority to Construct for the following equipment:

S-1 Emergency Standby Diesel Generator Set
Make: Cummins, Model: 4BT3.3-G5, Model Year: 2021
69 bhp, 0.38 MMBtu/hr
Permit Condition Nos. 100072, 100073, and 27845

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 meets 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 S1

| Pollutant | Emission Factor (g/bhp-hr) | Modified Emission Factor (g/bhp-hr) | Max Daily Emissions (lb/day) | Annual Emissions (lb/yr) | Annual Emissions (tons/yr) |
|--|----------------------------|-------------------------------------|------------------------------|--------------------------|----------------------------|
| NO _x | 2.77 | 2.77 | 10.09 | 21.02 | 0.011 |
| POC | 0.52 | 0.52 | 1.89 | 3.95 | 0.002 |
| CO | 1.49 | 1.49 | 5.44 | 11.34 | 0.006 |
| PM ₁₀ /PM _{2.5} ¹ | 0.22 | 0.15 | 0.55 | 1.14 | 0.001 |
| SO ₂ | N/A ² | N/A ² | 0.02 | 0.04 | 0.000 |

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-1
- Max daily emissions: 24-hour operation
- Emissions from EPA Engine Family MCEXL03.3BAA for S-1
- ¹ Conservative Assumption: All PM emissions are PM_{2.5}

- ² SO₂ emission factor from AP-42 Table 3.4-1, SO₂ (15 ppm) = 0.00809*0.0015 lb SO₂/bhp-hr

To comply with Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines, S-1 must meet emission standards for new stationary emergency standby diesel-fueled CI engines. To demonstrate compliance with the emission standard, the engine must be source tested to ensure the diesel PM₁₀/PM_{2.5} emissions meet the limit of 0.15 g/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) |
|-------------------------------------|---|--|---------------------------------------|
| NO _x | 0.000 | 0.011 | 0.011 |
| POC | 0.000 | 0.002 | 0.002 |
| CO | 0.000 | 0.003 | 0.006 |
| PM ₁₀ /PM _{2.5} | 0.000 | 0.001 | 0.001 |
| SO ₂ | 0.000 | 0.000 | 0.000 |

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. There were no other related projects permitted in the last five 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. This application did not qualify for HRA streamlining because receptors are located less than 100 feet from the proposed engine location.

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 toxic air contaminant (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 0.57 in a million, and the maximum project chronic hazard index is estimated at 0.00044. See HRA Report for more details.

Table 3. Risk screening results

| Maximally Exposed Receptor | Maximum Cancer Risk | Maximum Chronic Hazard Index |
|-----------------------------------|----------------------------|-------------------------------------|
| Residential | 0.29 chances in a million | 0.000077 |
| Off-site worker | 0.57 chances in a million | 0.00044 |

TBACT

In accordance with the District’s Regulation 2-5-301, this source does not require TBACT because the estimated source cancer risk does not exceed a cancer risk of 1.0 in a million. BACT and TBACT determinations for compression ignition engines with a rated capacity between 50-1000 bhp are described in BAAQMD BACT/TBACT Workbook for IC Engines – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 8. dated 12/22/2020 (see Attachment 1). The proposed engine complies with TBACT by having a certified PM emission rate that is less than or equal to 0.15 g/bhp-hour. The certified PM emission rate for this engine is 0.15 g/bhp-hour.

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 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 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-1 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 | 2.77 g/bhp-hr | 3.33 g/bhp-hr |

* The standard is expressed as 3.0 g/bhp of NMHC+NOx. NOx is estimated to be 95% of the combined standard (3.0*0.95 = 2.85 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 NO_x or POC, as specified in Regulation 2-2-302; 100 tons per year or more of PM_{2.5}, PM₁₀ or sulfur dioxide, as specified in Regulation 2-2- 303.

Table 4. Potential to Emit

| Pollutant | Existing Annual Emissions (TPY) | Application Annual Emissions* (TPY) | Facility Annual Emissions (TPY) * | Offset Requirement (TPY) | Offset Required |
|--|--|--|--|---------------------------------|------------------------|
| NO _x | 0 | 0.032 | 0.032 | >10 | N |
| POC | 0 | 0.006 | 0.006 | >10 | N |
| CO | 0 | 0.020 | 0.020 | - | N |
| PM ₁₀ /PM _{2.5} ¹ | 0 | 0.002 | 0.002 | ≥100 | N |
| SO ₂ | 0 | 0.000 | 0.000 | ≥100 | N |

*Annual emissions: Reliability-related activity of 50 hours and emergency operation of 100 hours for 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 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.

Public Notice (Regulation 2-1-412)

The proposed source is located 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 source.

All comments received shall be summarized in the final evaluation report.

Permit Conditions

Permit Condition #100072 for S-1

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 #100073 for S-1

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]

Permit Condition #27845 for S-1

1. The owner/operator shall ensure the engine has been modified by the manufacturer and is and operated in accordance with the manufacturer specifications and/or best modern practices. [Basis: Cumulative Increase, Title 17 CCR Section 93115.6(a)(3), 40 CFR 1039.101]
2. The owner/operator shall ensure engine emissions do not exceed the following limits: a. PM: 0.15 g/bhp-hour [Basis: Title 17 CCR Section 93115.6(a)(3)]

3. To demonstrate compliance with Part 2, the owner/operator shall conduct an initial Air District-approved source test within 60 days of startup and once every three years thereafter at the normal or expected load during emergency operation using Air District approved source test methods. The owner/operator shall document urea usage (gallons per minute) and average kW during all tests, 7 preferable as digital records. The owner/operator shall submit the source test results to the Air District's Source Test Section no later than 60 days after source test completion. [Basis: Title 17 CCR Section 93115.6(a)(3)]
4. The owner/operator shall comply with all applicable testing, sampling port location and safe access requirements as specified in Volume IV of the Air District's Manual of Procedures. The owner/operator shall notify the Air District's Source Test Section, in writing, of the source test protocols, sampling port locations, layout, access and projected test dates at least 30 days prior to testing. The following test methods shall be used for each pollutant: a. PM(filterable) EPA Method 5 or Air District- approved equivalent [Basis: Regulation 2-1-403]
5. To determine compliance with the above conditions, the owner/operator shall maintain the following records in an Air District- approved log and shall make these records available to Air District staff upon request. All records shall be retained 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 Synthetic Minor Operating Permit). These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable Air District or state regulations.
 - a. Source Test Notifications
 - b. All source test reports
 - c. Engine serial number and source number for each source test
 - d. Engine load percentage
 - e. Engine maintenance records [Basis: Cumulative Increase, Recordkeeping]

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-1 Emergency Standby Diesel Generator Set**
Make: Cummins, Model: 4BT3.3-G5, Model Year: 2021
69 bhp, 0.38 MMBtu/hr
Permit Condition Nos. 100072, 100073, and 27845

Prepared by: Brittany McIntosh, Air Quality Permit Technician

DRAFT

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 |
| 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

- | | |
|-------------------------------|---|
| <p>a.</p> <p>b.</p> <p>c.</p> | <p>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.</p> <p>Deleted (no longer applies).</p> <p>Cost- effectiveness analysis must be based on lesser of 50 hr/yr or non-emergency operation as limited by District health risk screen analysis.</p> |
|-------------------------------|---|

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 \leq 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 \leq 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 \leq 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) |

