

# ENGINEERING EVALUATION

**Facility ID 202972**  
**Southline Phase 1 Building 1**  
**20 Southline Ave, South San Francisco, CA 94080**  
**Application No. 717215**

## **Background**

Southline Phase 1 Building 1 (Facility) is applying for an Authority to Construct and Permit to Operate for the following equipment:

**S-2 Emergency Standby Diesel Engine-Genset**  
**Make: Caterpillar, Model: 3516C Model Year: 2024**  
**EPA Engine Family: RCPXL78.1NZZ**  
**2,937bhp, 18.66 MMBTU/hr**

*Abated by A-1 & A-2*

**A-1 Catalyzed Diesel Particulate Filter (DPF)**  
**Make: Johnson Matthey, Model: CRT(+)-16-H-CS-EISO-26/26-RT**

**A-2 Selective Catalytic Reduction (SCR)**  
**Make: Johnson Matthey, Model: S8X8-2+1-SS-EITO-26/26**

The Facility is part of a new office/research & development campus that is under construction in the area adjacent to Southline Avenue in South San Francisco, CA. The Facility currently has one (1) permitted emergency standby diesel engine powering a backup generator. In this application, the Facility is applying for an Authority to Construct for an emergency standby diesel engine (S-2) to power another backup generator.

S-2 meets the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) Tier 2 Off-road standard and will be equipped with a Diesel Particulate Filter (DPF) and Selective Catalytic Reduction (SCR) to meet Tier 4 emissions standards. The engine will burn commercially available California ultra-low sulfur diesel fuel (ULSD). The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

The proposed S-2 will be located in an overburdened community (OBC) in South San Francisco, and a health risk assessment (HRA) is required for the project. Therefore, this application is subject to the public notice requirements of BAAQMD Regulation 2-1-412.

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

## **Emissions Summary**

The criteria pollutants emitted from S-2 include nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM<sub>10</sub>/PM<sub>2.5</sub>). Criteria pollutant emissions from S-2 are outlined below.

**Table 1. Annual Emissions from S-2**

| <b>Pollutant</b>                                 | <b>Unabated Emission Factor (g/bhp-hr)</b> | <b>Abatement Efficiency (%)</b> | <b>Abated Emission Factor<sup>4</sup> (g/bhp-hr)</b> | <b>Annual Emissions (lb/yr)</b> | <b>Annual Emissions (tons/yr)</b> |
|--|--|---------------------------------|--|---------------------------------|-----------------------------------|
| NO <sub>x</sub>                                  | 3.78                                       | 86.8%                           | 0.50   | 161.5                           | 0.081                             |
| POC  | 0.194                                      | 27.8%                           | 0.14   | 45.3                            | 0.023                             |
| CO <sup>3</sup>                                  | 2.60                                       | 0%                              | 2.60   | 841.0                           | 0.420                             |
| PM <sub>10</sub> /PM <sub>2.5</sub> <sup>1</sup> | 0.0895                                     | 77.6%                           | 0.02   | 6.49                            | 0.003                             |
| SO <sub>2</sub>                                  | See Basis <sup>2</sup>                     | 0%                              | See Basis <sup>2</sup>                               | 1.78                            | 0.001                             |

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-2
- Unabated emission factors for NO<sub>x</sub>, POC, and PM are from EPA Engine Family RCPXL78.1NZS
- <sup>1</sup> Conservative Assumption: All PM emissions are PM<sub>2.5</sub>
- <sup>2</sup> SO<sub>2</sub> emission factor from AP-42 Table 3.4-1, SO<sub>2</sub> (15 ppm) = 0.00809\*0.0015 lb SO<sub>2</sub>/bhp-hr. Assume no abatement of SO<sub>2</sub>.
- <sup>3</sup> The unabated CO emission factor is assumed to the Tier 4 limit.
- <sup>4</sup> Used Final Tier 4 limit as abated emission factor for NO<sub>x</sub>, POC, CO, and PM. Abatement efficiencies for these pollutants are back-calculated from the abated emission factors.

Daily emissions are calculated to establish whether a source triggers the requirement for Best Available Control Technology (BACT) (10 lb/highest day total source emissions for any BACT pollutant). A full 24-hour day is assumed since no daily limits are imposed on intermittent and unexpected operations. Since the abated emission rates are not certified by EPA/CARB, the unabated emission factors are used to calculate the maximum daily emissions from the engine. The table below shows the calculated maximum daily emissions from S-2.

**Table 2. Maximum Daily Emissions from S-2**

| <b>Pollutant</b>                    | <b>Unabated Emission Factor (g/bhp-hr)</b> | <b>Max Daily Emissions (lb/day)</b> |
|-------------------------------------|--|-------------------------------------|
| NO <sub>x</sub>                     | 3.78                                       | 587.0                               |
| POC                                 | 0.194                                      | 30.1                                |
| CO                                  | 2.60                                       | 403.7                               |
| PM <sub>10</sub> /PM <sub>2.5</sub> | 0.0895                                     | 13.9                                |
| SO <sub>2</sub>                     | See Table 1                                | 0.85                                |

**Ammonia Slip**

S-2 will be equipped with an SCR (A-2), which will control emissions with ammonia via catalytic reactions. However, there will be a small amount of ammonia that will not react and will slip through the SCR. Below are estimated Ammonia emissions from this project.

**Table 3. Ammonia Slip Emissions from S-2**

| Source # | Ammonia Slip Conc. (ppmv @ 15% O <sub>2</sub> ) | Actual Temp. (°F) | Actual Exhaust Flow Rate (acfm) | Dry Standard Exhaust Flow Rate (dscfm) | Hourly Emission Rate (lb/hr) | Annual Emission Rate (lb/yr) |
|----------|---|-------------------|---------------------------------|--|------------------------------|------------------------------|
| S-2      | 10  | 752.1             | 15,292.8                        | 2,987.6                                | 0.28                         | 14.0                         |

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-2
- Ammonia volumetric concentration corrected to 0% O<sub>2</sub> from 15% O<sub>2</sub>
- Engine exhaust H<sub>2</sub>O content: 7.51%
- Engine exhaust O<sub>2</sub> content: 10.8%
- Exhaust flow rate adjusted to 0% H<sub>2</sub>O, 0% O<sub>2</sub>, and standard temperature and pressure

### **Plant Cumulative Increase**

Cumulative Increase is defined as the sum of all emissions increases authorized by authorities to construct and permits to operate issued to a facility since the applicable cumulative increase baseline date, which is April 5, 1991, for POC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and CO, and August 31, 2016, for PM<sub>2.5</sub>. The cumulative increase for the facility is summarized in the table below.

**Table 4. Cumulative Emissions Increase for Facility ID 202972**

| Pollutant         | Existing Emissions Post 4/5/91 (tons/yr) | Application Emissions (tons/yr) | Cumulative Emissions (tons/yr) |
|-------------------|--|---------------------------------|--------------------------------|
| NO <sub>x</sub>   | 0.175                                    | 0.081                           | 0.256                          |
| POC               | 0.003                                    | 0.023                           | 0.026                          |
| CO                | 0.019                                    | 0.420                           | 0.439                          |
| PM <sub>10</sub>  | 0.004                                    | 0.003                           | 0.007                          |
| PM <sub>2.5</sub> | 0.004                                    | 0.003                           | 0.007                          |
| SO <sub>2</sub>   | 0.000                                    | 0.001                           | 0.001                          |

### **Toxic Risk Screening**

A project is subject to Regulation 2, Rule 5 if emissions of toxic air contaminants (TAC) exceed any acute or chronic trigger levels in Table 2-5-1 of Regulation 2, Rule 5. There is one related source (S-1) permitted within the 5-year lookback period. Therefore, the project TAC emissions will include the emissions from the proposed S-2 and the existing S-1. S-1 is also an emergency standby diesel engine, but it is not equipped with an SCR, so the only TAC emitted from S-1 is Diesel Particulate Matter (Diesel PM). All PM emissions are considered Diesel PM. Table 5 below summarizes this project's TAC emissions.

**Table 5. Project Toxic Air Contaminant Emissions**

| Toxic Air Contaminant | Hourly Emission Rate (lbs/hr) | Acute Trigger Level (lbs/hr) | Annual Emission Rate (lbs/year) | Chronic Trigger Level (lbs/year) | Exceeds Acute or Chronic Trigger Level? |
|-----------------------|-------------------------------|------------------------------|---------------------------------|----------------------------------|---|
| Diesel PM             | -                             | -                            | 14.55                           | 0.26                             | Yes                                     |
| Ammonia               | 0.28                          | 1.4                          | 14.0                            | 7,700                            | No                                      |

As shown in Table 5, the annual project emission rate of Diesel PM exceeds the chronic trigger level. Therefore, the project is subject to Regulation 2, Rule 5. This application does not qualify for HRA streamlining due to the PM emission rates and proximity to the nearest sensitive receptor. A refined health risk assessment (HRA) was conducted and the results are summarized in Table 6 below.

**Table 6. Project HRA Results**

| Receptor     | Cancer Risk      | Chronic Hazard Index | Acute Hazard Index |
|--------------|------------------|----------------------|--------------------|
| Resident     | 3.7 in a million | 0.0010               | N/A                |
| Worker       | 1.6 in a million | 0.0012               | N/A                |
| PMI (1-hour) | N/A              | N/A                  | 0.0023             |

**Table 7. Maximally Exposed Individual (MEI) by Source**

| Source ID      | Maximum Cancer Risk | Receptor Type |
|----------------|---------------------|---------------|
| S-2 (new)      | 1.2 in a million    | Resident      |
| S-1 (existing) | 2.5 in a million    | Resident      |

The HRA results indicate that the maximum project cancer risk (resident) is estimated at **3.7 in a million**, the maximum project chronic hazard index (worker) is estimated at **0.0012**, and the maximum project acute hazard index (PMI) is **0.0023**.

The HRA results deem that the project complies with the project risk limitations of Regulation 2-5-302, which are a cancer risk of 6.0 in one million for a project located within an Overburdened Community, a chronic hazard index of 1.0 and an acute hazard index of 1.0, when limiting reliability-related activity hours by permit condition to 50 hours/year. See HRA report.

**Best Available Control Technology for Toxics (TBACT)**

Pursuant to Regulation 2-5-301, a new or modified source is subject to TBACT if the individual source cancer risk exceeds 1.0 in a million and/or if the chronic hazard index exceeds 0.20.

As shown in table 7, the individual cancer risk from S-2 exceeds 1.0 in a million. Therefore, S-2 is subject to TBACT.

TBACT determinations for compression ignition engines with a rated capacity greater than or equal to 1000 bhp are described in BAAQMD BACT/TBACT Workbook for IC Engines – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.5, Revision 0, dated 12/22/2020. S-2 will be equipped with a DPF that can achieve a reduction of PM emissions to the Tier 4 limit of 0.02 g/bhp-hr. Therefore, S-2 complies with TBACT. However, because the abated PM emission rate is not verified by the EPA and/or CARB, S-2 will be conditioned to require a source test for PM to verify compliance with the TBACT/Tier 4 limit of 0.02 g/bhp-hr.

### **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, NO<sub>x</sub>, CO, SO<sub>2</sub>, or PM<sub>10</sub>.

Based on the emission calculations in Table 2, S-2 triggers BACT for NO<sub>x</sub>, POC, CO, and PM<sub>10</sub>/PM<sub>2.5</sub> (PM) because the maximum daily emissions exceed 10 lbs/day for those pollutants.

Per Air District Regulation 2-2-202, BACT is defined as the most stringent emissions limitation, control device, or control technique that (1) has been achieved in practice at other similar sources and/or (2) is technologically feasible and cost-effective. To determine what level of control constitutes BACT for this emergency standby diesel engine, the Air District reviewed available control technologies that can be effective at controlling NO<sub>x</sub>, POC, CO, and PM from these sources.

### **Control Technology Review**

Several control technologies can reduce NO<sub>x</sub>, CO, POC, and PM emissions from emergency backup diesel engines. These technologies have been divided into three categories: Clean Fuels, Combustion Technologies, and Post-Combustion Technologies.

#### ***Clean Fuel Technology***

The use of diesel fuel with a low nitrogen content reduces the amount of NO<sub>x</sub> formed during combustion. The less nitrogen available in the fuel, the less that can be converted to NO<sub>x</sub> upon combustion. Diesel fuel producers are not required to remove nitrogen from the fuel specifically for NO<sub>x</sub> reduction purposes. But they are required to remove sulfur to comply with regulatory mandates, and the hydro-treating technique they use to remove the sulfur also removes most of the nitrogen. As a result, using ultra-low-sulfur diesel (ULSD) fuel will provide benefits in reducing NO<sub>x</sub> emissions as well as reducing sulfur dioxide emissions. ULSD fuel is required to be used by the California Air Resources Board (CARB) and is therefore achieved in practice for S-2.

#### ***Combustion Technologies***

NO<sub>x</sub>, CO, and POC emissions can be minimized by optimizing the engines' combustion process using techniques such as injection timing retard, preignition chamber combustion, air-to-fuel ratio adjustments, and derating. These combustion characteristics are determined by the design of the engine, which is dictated by the manufacturer and cannot be controlled by the end user. The end user can reduce emissions by using the cleanest

engines available, however. Engines are certified to meet progressively more stringent emissions performance standards using EPA's "Tier" system, with higher-tier engines representing more stringent levels of emissions control. For the size of engines that will be used for this project, the most stringent level of emissions control that can be achieved using combustion controls is Tier 2.<sup>1</sup> The use of Tier 2 engines is achieved in practice.

#### *Post-Combustion Technologies*

Currently, the most effective and prevalent post combustion technologies used to abate NOx, CO, and POC rely on the use of catalysts. For NOx reduction, catalytic technology can come in the form of a selective catalytic reduction unit, lean-NOx catalyst, or NOx adsorber. For CO and POC, reduction is typically achieved through an oxidation catalyst. For each of these technologies, the catalyst is used to lower the heat of reaction that is required for the breakdown and/or conversion of the target pollutants. For PM, the most effective and prevalent post-combustion control technology used is a diesel particulate filter (DPF). Catalyzed DPFs can control emissions of PM, CO, and POC. For larger engines with a rated power output exceeding 1,000 bhp, the use of post-combustion control technologies is also achieved in practice. Other facilities operating similar emergency standby engines have achieved emission rates equivalent to EPA's Tier 4 standards, which are the most stringent standards achievable by any engines that are available on the market today. The use of post-combustion technologies to achieve EPA Tier 4 emission standards is achieved in practice.

#### *BACT Analysis for S-2*

S-2 is an emergency standby engine with a rated power output exceeding 1,000 bhp. Post-combustion control technologies have been achieved in practice. Other facilities operating similar emergency backup engines have achieved emissions rates equivalent to EPA's Tier 4 standards, which are the most stringent standards achievable by any engines that are available on the market today. These control technologies are therefore required as BACT. S-2 will be required by CARB regulations to use ULSD fuel, and will be required by Air District permit conditions to utilize post-combustion technologies to meet the EPA Tier 4 emissions standards for the applicable pollutants. Therefore, S-2 complies with the BACT requirements under Regulation 2-2-301 for all applicable pollutants.

According to the emission data submitted to EPA for the engine family for S-2 and the expected abatement efficiencies of the post-combustion control devices, the abated NOx, POC, CO, and PM emission rates comply with the applicable BACT emission limits shown in the table below. However, because the engine is not certified to meet Tier 4 standards for NOx, POC, and PM by EPA, source testing will be required to verify compliance. To prevent engine tuning to reduce NOx emissions at the expense of increasing CO emissions, source testing will also be required for CO. These source testing requirements will be outlined in the permit conditions for S-2.

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<sup>1</sup> EPA's diesel emission tiers range from Tier 0 through Tier 4. The Tier 4 standards require catalytic control devices, which are addressed below. For diesel engines over 750 horsepower, there are no Tier 3 standards. The next most stringent set of standards for this size category after Tier 2 is Tier 4, which requires catalytic control devices. See California Air Resources Board, *Non-Road Diesel Engine Certification Tier Chart*, available at: <https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart-pdf>. The most stringent tier that can be achieved with combustion controls only is therefore Tier 2 for this size category.

**Table 8. BACT Analysis Summary: S-2**

| <b>BACT Pollutant Triggered</b> | <b>BACT Limit Tier 4 for Engines &gt; 750 HP (g/bhp-hr)</b> | <b>Abated Emission Rate (g/bhp-hr)</b> |
|---------------------------------|---|--|
| NOx                             | 0.5   | 0.5                                    |
| CO <sup>1</sup>                 | 2.6   | 2.6                                    |
| POC                             | 0.14  | 0.14                                   |
| PM                              | 0.02  | 0.02                                   |

**Notes:**

1. The engine when configured without any add-on control systems is certified by the EPA to a CO emission factor of 0.67 g/bhp, but the proposed engine in this application will be abated by add-one control and will be required to demonstrate compliance with the Tier 4 standard of 2.6 g/bhp-hr for CO as BACT.

**Offsets**

Per Regulation 2-2-302, offsets must be provided if, after a new or modified source is constructed, a facility has a potential to emit (PTE) more than 10 tons/yr of POC or NOx. Per Regulation 2-2-303, offsets must be provided if, after a new or modified source is constructed, a facility has a PTE of 100 tons/year or more of PM<sub>2.5</sub>, PM<sub>10</sub>, or SO<sub>2</sub>. The PTE for emergency-use engines will include the hours allowed for test and maintenance, as well as an assumed 100 hours per year for emergencies. The table below summarizes the facility PTE.

**Table 9. Potential to Emit for Facility ID 202972**

| <b>Pollutant</b>                    | <b>Existing Annual PTE Emissions (ton/yr)</b> | <b>Application Annual PTE (ton/yr)</b> | <b>Facility Annual PTE (ton/yr)</b> | <b>Offset Requirement (ton/yr)</b> | <b>Offset Required?</b> |
|-------------------------------------|---|--|-------------------------------------|------------------------------------|-------------------------|
| POC                                 | 0.009   | 0.068                                  | 0.077                               | 10                                 | N                       |
| NOx                                 | 0.525   | 0.242                                  | 0.767                               | 10                                 | N                       |
| PM <sub>10</sub> /PM <sub>2.5</sub> | 0.012   | 0.010                                  | 0.022                               | 100                                | N                       |
| SO <sub>2</sub>                     | 0.001   | 0.003                                  | 0.003                               | 100                                | N                       |
| CO                                  | 0.056   | 1.261                                  | 1.317                               | -                                  | N                       |

As shown above, the facility’s PTE is below the offset trigger levels specified in Regulation 2-2. Therefore, offsets are not required.

**Statement of Compliance**

**Regulation 2 - Permits, Rule 1 – General Requirements**

*CEQA (Section 2-1-310)*

Because S-2 is subject to BACT and TBACT requirements, the Air District’s approval of an Authority to Construct/Permit to Operate for the proposed source is discretionary, and it must be reviewed in accordance with the requirement of CEQA.

The installation and operation of S-2 is part of Phase 1 of a larger redevelopment project in the City of South San Francisco, titled “Southline Specific Plan” (Project). The plan for the Project is to redevelop an approximately 26.5-acre site with a new transit-oriented research-and-development (R&D)/office campus with a maximum anticipated building area of approximately 2,800,000 square feet. The final buildout will include multiple buildings, underground parking at various locations, an above-ground parking structure, supportive utilities and related infrastructure, and up to 7.8 acres of open space. Among other activities, the construction of Building 1 at 20 Southline Avenue is included in Phase 1 of the Project. The diesel engine proposed in this application (S-2) will power an emergency standby generator that will support Building 1 in the event of an unplanned power outage.

The City of South San Francisco (City) is the CEQA lead agency for the Project, and on July 13, 2022, the City certified a Final Environmental Impact Report (FEIR) and adopted CEQA Findings, a Statement of Overriding Considerations (SOC), and a Mitigation Monitoring & Reporting Program (MMRP) for the project, under State Clearinghouse Number SCH #2020050452. On July 28, 2022, the City filed a Notice of Determination (NOD) with the county clerk of the County of San Mateo, noting that the project will have a significant effect on the environment and as such, mitigation measures were made a condition of approval.

As a responsible agency for the Project, the Air District has reviewed and considered the FEIR and agrees with the City’s assessment that certain significant environmental impacts could occur as a result of the Project. For each significant impact, changes or alterations have been required in, or incorporated into, the Project which avoids or substantially lessens the environmental effects as identified in the FEIR to the extent feasible. In approving this Project, the City adopted mitigation measures as a condition of the approval and adopted an MMRP. However, potentially significant and unavoidable impacts remain after mitigation. Based on its review of the Project’s environmental impacts in the City’s environmental analysis and in the applicant’s permit application, the Air District is not imposing any new mitigation measures under CEQA, so the Air District is not adopting an MMRP. Before making a final decision on this application, the Air District will consider any public comments received during the 30-day public comment period required by Air District Regulation 2-1-412.

The City’s FEIR (with comments and responses) and other related CEQA documents are available for public review at the City’s Planning Division at 315 Maple Ave, South San Francisco, CA 94080. The CEQA documents are also available online on the State of California’s CEQAnet Web Portal<sup>2</sup>.

***Public Notice, Schools & Overburdened Communities (Section 2-1-412)***

A new or modified source located (1) within 1,000 feet of the outer boundary of a K-12 school site which results in the increase in emissions of a toxic air contaminant in Table 2-5-1 of *Regulation 2, Rule 5 New Source Review of Toxic Air Contaminants* or (2) within an Overburdened Community (OBC) as defined in Regulation 2-1-243 that requires a

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<sup>2</sup> CEQA Project Information & Documents for the Southline Specific Plan: <https://ceqanet.opr.ca.gov/Project/2020050452>

Health Risk Assessment (HRA) pursuant to Regulation 2-5-401 shall prepare and distribute a public notice in accordance with subsections 412.1 and 412.2 of *Regulation 2, Rule 1 General Requirements*.

The proposed source is not located within 1,000 feet of a K-12 school, but it will be located in an OBC of South San Francisco, and it is subject to an HRA. Therefore, a public notification pursuant to Reg. 2-1-412 is required. A public notice will be sent to all addresses within 1,000 feet of the facility. There will be a 30-day public comment period.

***Prevention of Significant Deterioration (PSD) (Sections 2-2-304 through 307)***

These sections establish standards for PSD BACT requirements, PSD source impact analysis requirements, and PSD additional impacts analysis requirements.

This facility will not emit 100 tons or more per year of any PSD pollutant and, therefore, is not a major PSD facility and is not subject to any of the PSD requirements in Regulations 2-2-304 through 2-2-307 per Regulation 2-2-224.

***NAAQS Protection Requirement (Section 2-2-308)***

Per Regulation 2-2-308, if a project will result in a significant net increase in emissions of CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, or lead, the applicant must demonstrate that the emissions will not cause or contribute to any exceedance of the National Ambient Air Quality Standards for these pollutants.

This project will not involve any significant net emissions increases, as defined in Regulation 2-2-227.2.

***Publication of Notice and Opportunity for Public Comment (Section 2-2-404)***

If an application involves a major facility, a PSD project, or an increase in CO, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, or lead in an amount that is significant as defined in Regulation 2-2-227.2, the BAAQMD must prepare and distribute a public notice and provide an opportunity for public comment in accordance with Regulation 2-2-404 (Publication of Notice and Opportunity for Public Comment).

This application does not involve a major facility or PSD project, and it will not increase emissions above any of the significance levels defined in Regulation 2-2-227.2.

**Regulation 2- Permits, Rule 6 Major Facility Review**

*Regulation 2 Rule 6* implements the operating permit requirements of Title V of the federal Clean Air Act as amended in 1990. The rule applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities and any facility in a source category designated by the Administrator of the EPA in a rulemaking as requiring a Title V permit. The rule also provides a means by which facilities can avoid the Title V or other requirements by limiting their potential to emit. A major facility is defined in Section 2-6-212 as one that has the potential to emit 100 tons per year of any regulation air pollutant as defined in Section 2-6-222, or that has the potential to emit 10 tons per year of a single hazardous air pollutant (HAP) or 25 tons per year or more of a combination of HAPs.

The facility's potential to emit of criteria pollutants was calculated in accordance with District Policy and presented previously in Table 9; all emissions are below 100 tons per year per pollutant threshold for a major facility.

A summary of the facility's potential to emit of HAPs is summarized in Table 10 below. The PTE for Ammonia emissions was calculated with the assumption of 100 additional hours per year.

**Table 10. Potential to Emit of Hazardous Air Pollutants for Facility ID 202972**

| Pollutant | Existing Annual PTE Emissions (ton/yr) | Application Annual PTE (ton/yr) | Facility Annual PTE (ton/yr) | Major Facility Threshold (ton/yr) |
|-----------|--|---------------------------------|------------------------------|-----------------------------------|
| Diesel PM | 0.012                                  | 0.010                           | 0.022                        | 10                                |
| Ammonia   | 0.000                                  | 0.021                           | 0.021                        | 10                                |
| Total HAP | 0.012                                  | 0.031                           | 0.043                        | 25                                |

As shown above, the facility's HAP PTE is well below the Major Facility thresholds.

The facility is not a Phase II Acid Rain Facility (Section 2-6-217) or a Subject Solid Waste Incinerator Facility (Section 2-6-229), or a facility defined in a source category defined by EPA requiring a Title V permit. Therefore, Title V requirements, as implemented by Regulation 2, Rule 6 are not triggered.

### **Regulation 6 - Particulate Matter, Rule 1 - General Requirements**

#### ***Ringelmann No. 1 Limitation (Section 6-1-301)***

Except as provided in Sections 6-1-303, 6-1-304 and 6-1-306, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree.

Since the engine is expected to emit low amount of PM<sub>10</sub>, it is expected to comply with *Regulation 6-1-301*, pending a regular inspection.

#### ***Opacity Limitation (Section 6-1-302)***

Except as provided in Sections 6-1-303, 6-1-304 and 6-1-306, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour an emission equal to or greater than 20% opacity as perceived by an opacity-sensing device, where such device is required by BAAQMD regulations.

Since the engine is expected to emit low amount of PM<sub>10</sub>, it is expected to comply with *Regulation 6-1-302*, pending a regular inspection.

#### ***Visible Particles (Section 6-1-305)***

A person shall not emit particles which are large enough to be visible as individual particles at the emission point or of such size and nature as to be visible individually as incandescent particles.

Since the engine is expected to emit low amounts of PM<sub>10</sub>, not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to comply with *Regulation 6-1-305*, pending a regular inspection.

***Particulate Weight Limitation (Section 6-1-310)***

A person shall not emit from any source particulate matter in excess of 0.15 grains/dscf of exhaust gas volume.

The PM emission rate from S-2 is 0.02 grams/bhp-hr, which results in an outlet grain loading of about 0.002 grains/dscf based on the engine's set specifications (2,937 bhp, 15,292.8 acfm exhaust flow, and 752.1° F emissions stack temperature). The PM emission rate for the project is much less than the 0.15 grains/dscf limit and complies with *Regulation 6-1-310.1*. Note that the TSP concentration limits set forth in *Regulation 6-1-310.2* do not apply because the PTE for PM per source is below the 1000 kg per year applicability threshold.

**Regulation 9 – Inorganic Gaseous Pollutants, Rule 1 Sulfur Dioxide**

The proposed engine is subject to the following sections of Regulation 9, Rule 1 and will comply with all sections by burning Ultra Low Sulfur Diesel with a sulfur content of 15 ppm, which results in less than 1 ppmv of SO<sub>2</sub> in the exhaust gas.

***Limitations on Ground Level Concentrations (Section 9-1-301)***

Sulfur Dioxide emissions shall not 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.

***General Emission Limitation (Section 9-1-302)***

A gas stream containing Sulfur Dioxide shall not contain sulfur dioxide in excess of 300 ppm (dry).

***Fuel Burning (Liquid and Solid Fuels) (Section 9-1-304)***

The sulfur content of liquid fuel burned shall not exceed 0.5% by weight.

**Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 NO<sub>x</sub> and CO from Stationary Internal Combustion Engines**

***Exemptions (Section 9-8-110)***

Section 110.5 exempts emergency standby engines from the requirements of Sections 9-8-301 through 305, 501 and 503.

***Emergency Standby Engines, Hours of Operation (Section 9-8-330)***

The engine is subject to the requirements of *Regulation 9-8-330*, which limits reliability related operation of the engine to 50 hours per year per engine.

Permit Conditions for S-2 will include an operating limit that complies with this standard.

***Monitoring and Records (Section 9-8-500)***

The engine is subject to the reporting requirements of Sections 502 and 530.

Permit Conditions for S-2 will include reporting requirements that meet this standard.

**Regulation 10 – Standards of Performance for New Stationary Sources**

***New Source Performance Standards (NSPS)***

Any new or modified source is required to comply with *Regulation 10, Standard of Performance for New Stationary Sources* – which is Title 40, Part 60 of the Code of Federal Regulation incorporated by reference. According to §60.4200(a)(1), the provisions of 40 CFR Part 60 Subpart IIII *Standards of Performance for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)* are applicable to (1) manufacturers of stationary CI ICEs with a displacement of less than 30 L/cylinder where the model year is 2007 or later for non-fire pump engines, and (2) owners and operators of stationary CI ICE that commence construction after July 11, 2005 and are manufactured after April 1, 2006 (and are not fire pump engines).

§60.4205 specifies the emission standards that must be met by owners/operators of stationary CI ICE emergency engines. Per §60.4205(b), owners/operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 L/cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202 for all pollutants (for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE).

§60.4202 specifies emergency engine emissions standards for manufacturers of stationary CI ICEs. Per §60.4202(a)(2), manufacturers must certify their 2007 model year and later CI ICEs with a maximum engine power less than 3000 HP and displacement of less than 10 liters per cylinder that are not fire pump engines to the Tier 2 emission standards as described in in 40 CFR Part 1039, Appendix I for all pollutants. The emission rates from the manufacturer’s Performance Data Sheet and the EPA certified emission rates for the engine family compared to the Tier 2 emission standards contained in 40 CFR Part 1039, Appendix I, Table 2 for engines rated higher than 560 kW for model years effective in 2006, is summarized below.

**Table 11. Engine Emission Rates vs. 40 CFR 1039, Appendix I, Table 2 Emission Standards**

| <b>Pollutant</b>       | <b>40 CFR 1039, Appendix I Table 2 Emission Standard (g/kW-hr)</b> | <b>EPA Certified Emission Rates for Engine Family RCPXL78.1NZS (g/kW-hr)</b> |
|------------------------|--|--|
| NMHC + NO <sub>x</sub> | 6.4  | 5.3  |
| CO                     | 3.5  | 0.9  |
| PM                     | 0.20   | 0.12   |

As shown above, the EPA certified emissions rates for the engine family for S-2 satisfy the applicable emissions standards.

The engine is exempt from the smoke emission standards of 40 CFR 1039.105 because the engine is constant-speed (exemption 1039.105(a)(2)).

§60.4206 requires that the owner/operator of a stationary CI ICE meet the applicable emission standards specified in §60.4205 over the entire life of the engine.

The owner/operator is expected to comply with this requirement.

§60.4207 specifies fuel requirements that must be met for owners/operators of a stationary CI ICE engine subject to Subpart III. Effective October 1, 2010, engines with a displacement less than 30 L/cylinder that use diesel fuel must meet the requirements of 40 CFR 80.510(b) for nonroad diesel fuel. 40 CFR 80.510(b) specifies standards of 15 ppm maximum sulfur content for nonroad diesel fuel and a cetane index of 40 or aromatic content of 35%.

The owner/operator is expected to comply with this requirement because CARB allows only ultra-low sulfur diesel to be used for stationary engines in California.

§60.4209 specifies the monitoring requirements for owner/operators of stationary CI ICEs: emergency engines not meeting emission standards must be equipped with a non-resettable hour meter prior to startup, and DPFs (if equipped) must be installed with a backpressure monitor that notifies the owner/operator when high backpressure limit is approached. In addition, monitoring requirements of §60.4211 must be met (see next subsection, below).

S-2 meets the standards applicable to emergency engines and will be equipped with a non-resettable hour meter prior to startup of the engine (even though it is not specifically required to do so per this section). The DPF will be equipped with a backpressure monitor to comply with this requirement. Standard permit conditions will be imposed to ensure compliance with these requirements.

§60.4211 requires (a) owners/operators operate and maintain the engine and control device according to manufacturer's emission-related written instructions, change only those emission-related settings that are permitted by the manufacturer, and meet the requirements of 40 CFR 89, 94, and/or 1068 if applicable. In addition, §60.4211(c) requires owner/operators of 2007 model year and later CI ICEs complying with §60.4205(b) standards to purchase a certified engine, installed and configured according to the manufacturer's emission-related specifications. Lastly, §60.4211(f) specifies emergency engine operation for non-emergency purposes are limited to 50 hours per year (up to 100 hours per year for certain situations) and emergency use is unlimited.

The owner/operator is expected to comply with the requirements outlined in §60.4211. The proposed engine is part of certified EPA Engine Family RCPXL78.1NZS. Due to the CARB ATCM limiting non-emergency use to 50 hours per year, the 100 hours per year provision does not apply.

§60.4214 specifies notification, reporting and recordkeeping requirements for owners/operators of CI ICEs.

S-2 is not subject to initial notification requirements of §60.4214(b) because it is an emergency engine that meets the standards applicable to non-emergency engines in the applicable model year.

§60.4218 specifies the general provisions in 40 CFR 60.1 to 60.19 applicable.

The owner/operator is expected to comply with these provisions.

**Regulation 11 – National Emission Standards for Hazardous Air Pollutants**

*National Emission Standards for Hazardous Air Pollutants (NESHAP)*

There are no subparts under 40 CFR Part 61 that apply to ICEs. Therefore, this regulation does not apply to any of the proposed sources in this application.

40 CFR Part 63 Subpart ZZZZ establishes NESHAPs for Stationary Reciprocating Internal Combustion Engines (RICEs). Both area and major sources of RICEs are subject to Subpart ZZZZ. The facility constitutes an area source of HAPs because the potential to emit any single/combined HAP are below the 10/25 tons per year threshold for major sources. The proposed engine (S-2) is a new stationary RICE CI at an area source subject to (and compliant with) regulations under 40 CFR Part 60 Subpart IIII. Therefore, per 40 CFR 63.6590(c)(1), no further requirements apply for the proposed engine under Subpart ZZZZ.

**Other Regulations**

The BAAQMD is charged with enforcing the requirements of California’s Air Toxic Control Measure for Stationary Compression Ignition Engines *Title 17, California Code of Regulations, Section 93115* for the purpose of reducing diesel particulate matter (PM) and criteria pollutant emissions from stationary diesel-fueled compression ignition (CI) engines.

*Airborne Toxic Control Measure (ATCM) for Emergency Standby Diesel-Fueled CI Engines (>50 bhp)*

Subsection 93115.6(a)(3)(A)(1)(a) sets forth Emission Standards for new stationary emergency standby diesel fueled compression ignition engines with maximum engine power greater than 50 HP.

S-2 is subject to and meets the requirements of this section of the ATCM as shown in the table below:

**Table 12. Engine Emission Rates vs. ATCM Emission Standards**

| Pollutant              | ATCM Emission Standards<br>Engine HP > 750<br>(g/bhp-hr) | EPA Certified<br>Emission Rate<br>(g/bhp-hr) |
|------------------------|--|--|
| PM                     | 0.15   | 0.09   |
| NMHC + NO <sub>x</sub> | 4.8  | 3.95   |
| CO                     | 2.6  | 0.67   |

*Subsection 93115.6(a)(3)(A)(1)(b)* requires that new stationary emergency standby diesel-fueled engines (>50 bhp) be certified to the emission standards as specified in *40 CFR, Part 60, Subpart III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*.

S-2 is certified to meet EPA Tier 2 standards, it will meet EPA Tier 4 standards with abatement, and it meets 40 CFR Part 60 Subpart III; therefore, S-2 complies with this section of the ATCM.

*Subsection 93115.6(a)(3)(A)(1)(c)* limits the non-emergency operation of 50 hours/year for maintenance and testing.

Permit Conditions for S-2 will limit non-emergency operation to 50 hours/year/engine and as such, will comply with this section of the ATCM.

## **PERMIT CONDITIONS**

### **Permit Condition #100072 – Applies to S-2**

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 – Applies to S-2**

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 #100693– Applies to S-2**

Tier 2 Engines, equipped with add-on SCR and DPF; ST for NO<sub>x</sub>/CO, POC & PM.

1. The owner/operator shall ensure each engine is abated at all times of operation by an approved Selective Catalytic Reduction (SCR) System and Diesel Particulate Filter (DPF) equipped with a backpressure monitor or other approved Diesel Exhaust Particulate Matter Abatement System. The engine, SCR System, and DPF with backpressure monitor, or other approved system shall be installed, maintained, 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, BACT, TBACT, Regulation 2, Rule 5]
2. The owner/operator shall take all corrective actions recommended by the manufacturer in response to backpressure monitor notifications.  
[Basis: Cumulative Increase, Title 17 CCR Section 93115.6(a)(3), 40 CFR 1039.101, BACT]
3. The owner/operator shall ensure urea injection commences as soon as the SCR catalyst bed reaches the minimum operating temperature as specified by the manufacturer.  
[Basis: Cumulative Increase, Title 17 CCR Section 93115.6(a)(3), 40 CFR 1039.101, BACT]
4. The owner/operator shall ensure engine emissions do not exceed an ammonia (NH<sub>3</sub>) slip of 10 ppmv, dry @ 15% O<sub>2</sub> from the SCR system. If deemed necessary to demonstrate compliance with Regulation 2, Rule 5, the Air District may require a source test to determine compliance with this emission limit.  
[Basis: Regulation 2, Rule 5]

5. The owner/operator shall ensure engine emissions do not exceed the following limits:

**NO<sub>x</sub>:** 0.50 g/bhp-hour  
**CO:** 2.60 g/bhp-hour  
**POC:** 0.14 g/bhp-hour  
**PM:** 0.02 g/bhp-hour

[Basis: BACT, TBACT, Cumulative Increase, Regulation 2, Rule 5]

6. To demonstrate compliance with Part 5, the owner/operator shall conduct an initial Air District-approved source test on the engine 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, preferably 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: BACT and Cumulative Increase]

7. 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:

**NO<sub>x</sub>:** EPA Method 7E or Air District-approved equivalent  
**CO:** EPA Method 10 or Air District-approved equivalent  
**POC:** EPA Method 25A and EPA Method 18 or Air District-approved equivalent  
**PM (filterable):** EPA Method 5 or Air District-approved equivalent

[Basis: Regulation 2-1-403]

8. To determine compliance with the above parts, 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, SCR, and DPF maintenance records.
- f. SCR system owner's manual or manufacturer's specifications.
- g. DPF owner's manual or manufacturer's specifications.
- h. All backpressure monitor notifications and corrective actions.
- i. SCR urea injection rate (gpm).

[Basis: BACT, Cumulative Increase, Recordkeeping]

***End of Conditions***

**Recommendation**

The Air 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 is subject to a public notice, per Air District Regulation 2-1-412. After public comments are received, reviewed, and addressed, the Air District will make a final determination on the permit.

I recommend that the Air 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:

**S-2 Emergency Standby Diesel Engine-Genset**  
**Make: Caterpillar, Model: 3516C Model Year: 2024**  
**EPA Engine Family: RCPXL78.1NZS**  
**2,937bhp, 18.66 MMBTU/hr**

*Abated by A-1 & A-2*

**A-1 Catalyzed Diesel Particulate Filter (DPF)**  
**Make: Johnson Matthey, Model: CRT(+)-16-H-CS-EISO-26/26-RT**

**A-2 Selective Catalytic Reduction (SCR)**  
**Make: Johnson Matthey, Model: S8X8-2+1-SS-EITO-26/26**

By: *Cameron Fee*

Date: July 1, 2025

Cameron Fee  
Senior Air Quality Engineer