

## ENGINEERING EVALUATION

**Peterson Power Systems, Inc.**  
**2828 Teagarden Street, San Leandro, CA 94577**  
**Facility ID #: 203455**  
**Application #: 698526**

### I. BACKGROUND

Peterson Power Systems, Inc. (Applicant) is applying for an Authority to Construct/ Permit to Operate for the following equipment:

**S-1 Emergency Standby Diesel Engine**  
**Make: Caterpillar, Model: C15 DITA, 619 bhp**

Criteria pollutants of concern from the engine are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), nonmethane hydrocarbons (NMHC)/precursor organic compounds (POC), sulfur dioxide (SO<sub>2</sub>), particulate matter with an aerodynamic diameter of less than 10 microns (PM<sub>10</sub>), and particulate matter with an aerodynamic diameter of less than 2.5 microns (PM<sub>2.5</sub>). The toxic air contaminant (TAC) of concern from the engine is diesel particulate matter (DPM).

S-1 meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 3 nonroad emission standards. The engine will burn commercially available California low sulfur diesel fuel, and the sulfur content of the diesel fuel will not exceed 0.0015% by weight.

### II. EMISSIONS SUMMARY

Using information provided by the Applicant, **Table 1** summarizes criteria pollutant emission from S-1.

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

Pollutant <sup>1</sup>	Emission Factor (g/bhp-hr) <sup>2,3</sup>	Emissions <sup>4,5</sup>		
		Max Daily (lb/day)	Annual (lb/year)	Annual (ton/year)
NO <sub>x</sub>	2.54	83.0	173	0.087
NMHC (POC)	0.15	4.9	10	0.005
CO	2.54	83.0	173	0.087
PM <sub>10</sub> /PM <sub>2.5</sub>	0.11	3.7	8	0.004
SO <sub>2</sub>	5.5E-03	0.2	0	0.000

Notes:

1. PM<sub>2.5</sub> emissions are conservatively assumed to be equal to PM<sub>10</sub> emissions.
2. Emission factors are based on EPA certified data for EPA Engine Family 6CPXL15.2ESK.
3. The SO<sub>2</sub> emission factor (EF) is derived using the follow equation from AP-42 Chapter 3.4 Table 3.4-1<sup>1</sup>, which is based on the full conversion of fuel sulfur to SO<sub>2</sub> and a sulfur content (S) of 0.0015 wt%:

$$SO_{2EF} = 0.00809 \times S = 0.00809 \times 0.0015 = 1.2E - 05 \frac{lb}{bhp - hr} \times 453.592 \frac{g}{lb} = 5.5E - 03 \frac{g}{bhp - hr}$$

4. Maximum daily emissions are conservatively based on 24 hours of operation.
5. Maximum annual emission are based on 50 hours of reliability-related activity.

<sup>1</sup> "AP-42 Vol. I, 3.4: Large Stationary Diesel and All Stationary Dual-fuel Engines". EPA. October 1996.

### III. CUMULATIVE INCREASE

**Table 2** summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

Table 2: Facility Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/year)	Application Emissions (tons/year)	Cumulative Emissions (tons/year)
NO <sub>x</sub>	0	0.087	0.087
NMHC (POC)	0	0.005	0.005
CO	0	0.087	0.087
PM <sub>10</sub> /PM <sub>2.5</sub>	0	0.004	0.004
SO <sub>2</sub>	0	0.000	0.000

### IV. HEALTH RISK ASSESSMENT (HRA)

Pursuant to Regulation 2-5-110, a project shall not be subject to this rule if, for each TAC, the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs permitted within the last five years. **Table 3** provides a summary of project TAC emissions. There were no related applications permitted within the last five years.

Table 3: Project TAC Emission Summary

Pollutant	Annual Emissions (lb/year)	Chronic Trigger Level (lb/year)	Exceeds Chronic?
DPM	7.63	0.26	Yes

Notes:

<sup>1</sup> DPM emissions are conservatively assumed to be equal to PM<sub>10</sub> emissions.

As shown in **Table 3**, S-1 emits DPM at rates that exceed the chronic trigger level specified in Table 2-5-1. Therefore, an HRA was required as part of this application.

An HRA was completed on May 8, 2024. The HRA focused on estimating the incremental health risk resulting from TAC emissions from the non-emergency operation of a new standby diesel engine at this facility. Results from the HRA indicate that the project cancer risk is estimated at 0.74 in a million, and the project chronic hazard index (HI) is estimated at 0.00057.

In accordance with the District's Regulation 2-5-301, this source does not require Best Available Control Technology for Toxics (TBACT) because the estimated source risk does not exceed a cancer risk of 1.0 in a million, and/or a chronic HI of 0.20.

Since the estimated project cancer risk does not exceed 6.0 in a million, and the estimated project chronic HI does not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements for projects located in an Overburdened Community (OBC), as defined in Regulation 2-1-243.

## V. 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 (PTE) of 10.0 pounds or more per highest day of POC, non-precursor organic compounds (NPOC), NO<sub>x</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, or PM<sub>2.5</sub>.

As shown in **Table 1**, BACT is triggered for NO<sub>x</sub> and CO.

Per Section 2-2-202, BACT is defined as an emission limitation, control device, or control technique applied at a source that is the most stringent of:

- the most effective device or technique successfully utilized,
- the most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source,
- the most effective emission control limitation for the type of equipment comprising such a source that is contained in an approved implementation plan of any state, or
- the most effective control device or technique or most stringent emission limitation that is technologically feasible, taking into consideration cost-effectiveness, any ancillary health and environmental impacts, and energy requirements.

These requirements are generally categorized as either technologically feasible and cost-effective (termed "BACT<sup>(1)</sup>") or achieved-in-practice (termed "BACT<sup>(2)</sup>"). BACT<sup>(2)</sup> is either equal to or less stringent than BACT<sup>(1)</sup>. Because achieved-in-practice is required regardless of cost and BACT<sup>(1)</sup> is more stringent than BACT<sup>(2)</sup>, an evaluation for what has been achieved-in-practice is first conducted.

### Achieved-in-Practice

Achieved-in-practice BACT 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 NO<sub>x</sub> and CO, achieved-in-practice BACT has been determined to be meeting the CARB Air Toxics Control Measure (ATCM) standard for the respective pollutant at the applicable horsepower rating.

### Technologically Feasible and Cost-Effective

The following control technologies and mitigation measures have been found technically feasible for abating NO<sub>x</sub> emissions from internal combustion engines<sup>2</sup>:

- Engine ignition timing retard (achievable NO<sub>x</sub> reduction 20 to 30 percent), and
- Selective catalytic reduction (achievable NO<sub>x</sub> reduction of 90 percent)

Techniques for mitigating CO emissions include:

- Catalytic oxidation, and
- Good combustion practices (e.g., preventative maintenance, change oil and filter every 500 hours of operation, inspect all hoses and belts every 500 hours of operation, minimize idling time).

Although Regulation 2-2 does not include a definition for cost-effectiveness, Section 2-2-414 requires the Air District to publish and periodically update a BACT Workbook that will be used as a guidance document for determining BACT.

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<sup>2</sup> United States Environmental Protection Agency. Control Techniques Guidelines for Alternative Control Techniques Document – NO<sub>x</sub> Emissions from Stationary Reciprocating Internal Combustion Engines. EPA-453/R-93-032. July 1993. Updated September 2000.

The Policy and Implementation Procedures in Section 1 of the BACT Workbook includes a maximum cost guideline for NO<sub>x</sub> emissions of \$17,500 per ton of emissions reduced. The BACT Workbook does not have a maximum cost effectiveness value for CO, however the South Coast Air Quality Management District lists a maximum cost-effectiveness value of \$807 for CO<sup>3</sup>.

Using these maximum cost effectiveness values and assuming that 90 percent of the emissions in **Table 1** could be abated, maximum annualized costs for NO<sub>x</sub> controls could not exceed \$1,362 and \$63 for CO controls to be deemed cost-effective.

All NO<sub>x</sub> and CO controls are expected to exceed both maximum annualized costs. Therefore, requiring more stringent controls than meeting achieved-in-practice requirements is deemed not cost-effective.

Consequently, S-1 is required to comply with the current achieved-in-practice standards. **Table 4** demonstrates that S-1 satisfies the current BACT<sup>(2)</sup> standards for NO<sub>x</sub> and CO.

Table 4: S-1 BACT Compliance

Pollutant	Emission Factor (g/bhp-hr)	BACT <sup>(2)</sup> Standard (g/bhp-hr) <sup>1</sup>
NO <sub>x</sub>	2.54	2.85
CO	2.54	2.6

**Notes:**

<sup>1</sup> The NO<sub>x</sub> standard is expressed as a combined standard for NMHC (POC) + NO<sub>x</sub>. NO<sub>x</sub> is estimated to be 95% of the combined standard (3\*0.95 = 2.85 g/bhp-hr).

## VI. OFFSETS

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of POC or NO<sub>x</sub>. Furthermore, pursuant to Regulation 2-2-303, offsets must be provided for any new or modified source at a facility that will have the potential to emit 100 tons per year or more of PM<sub>2.5</sub>, PM<sub>10</sub>, or SO<sub>2</sub>. **Table 5** summarizes the PTE for this facility.

Table 5: PTE for Facility #698526

Pollutant	Annual Emissions (tons/year)			Offsets Requirement (tons/year)	Offsets Required?
	Existing	Application <sup>1</sup>	Facility <sup>1</sup>		
NO <sub>x</sub>	0	0.260	0.260	>10	No
POC	0	0.015	0.015	>10	No
CO	0	0.260	0.260	-	No
PM <sub>10</sub>	0	0.011	0.011	≥100	No
PM <sub>2.5</sub>	0	0.011	0.011	≥100	No
SO <sub>2</sub>	0	0.001	0.001	≥100	No

**Notes:**

<sup>1</sup> Annual emissions for S-1 are calculated assuming 50 hours of reliability-related activity and 100 hours of emergency operation.

According to **Table 5**, offsets are not required since the facility's PTE does not exceed the offset trigger levels.

<sup>3</sup> "2023 South Coast Air Quality Management District BACT Maximum Cost Effectiveness Values (\$/Ton)". South Coast Air Quality Management District (SCAQMD). 2023.

## VII. 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 2

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

The proposed source is located within an Overburdened Community, as defined in Regulation 2-1-243, and requires an HRA. The proposed source is also located within 1,000 feet of a K-12 school with more than 12 students enrolled and will result in an increase in TAC emissions. Therefore, the proposed source is subject to the public notification requirements of Regulation 2-1-412. **Table 6** summarizes the schools subject to public noticing for this application.

Table 6: Schools Subject to Public Noticing for A#698526

School Name	Street Address
Lincoln High (Continuation) School	1145 Aladdin Avenue San Leandro, CA 94577

A public notice will be prepared and sent to all parents or guardians of students enrolled at the schools listed above within ¼ mile of the source and all business and residents within 1,000 feet of the proposed source. All comments received shall be summarized in the final evaluation report.

##### Regulation 6

Regulation 6-1-303 (Ringelmann No. 2 Limitation)

Regulation 6-1-305 (Visible Particles)

Regulation 6-1-310 (Total Suspended Particulate (TSP) Concentration Limits)

Sections 6-1-310.1 and 6-1-310.2 limit TSP emissions to 0.15 grains/dscf of exhaust gas volume or less depending on the exhaust gas rate (see Table 6-1-310.2 for the corresponding TSP concentration limit).

The certified particulate emission rate from S-1 is 0.11 g/bhp-hr. Using an F Factor of 9,190 dscf/MMBtu per EPA Method 19<sup>4</sup>, the outlet grain loading rate is calculated as follows:

$$\frac{0.11 \text{ g}}{\text{bhp} - \text{hr}} \times 619 \text{ bhp} \times \frac{1 \text{ lb}}{454 \text{ g}} \times \frac{7000 \text{ grains}}{1 \text{ lb}} \times \frac{1 \text{ hr}}{4.3 \text{ MMBtu}} \times \frac{1 \text{ MMBtu}}{9190 \text{ dscf}} = \frac{0.03 \text{ grains}}{\text{dscf}}$$

Since the grain loading rate of 0.03 grains/dscf is less than the limit in Section 6-1-310, compliance with this Section is expected.

##### Regulation 9

Regulation 9-1-301 (Limitations on Ground Level Concentrations of SO<sub>2</sub>)

Regulation 9-8 (NO<sub>x</sub> 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

<sup>4</sup> "Method 19 – Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxide Emission Rates". EPA. 2023.

## **California Environmental Quality Act (CEQA)**

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This project includes an internal combustion diesel engine that will power an emergency generator that may be employed to mitigate unforeseen loss of power events and prevent or reduce damage to life, health, and property at an existing facility.

The 2023 CEQA Statute and Guidelines lists classes of projects in Section 15300, which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA.

Section 15301 lists Class 1 projects that involve negligible or no expansion of use. This includes additions to existing structures provided that the addition will not result in an increase of more than 50 percent of the floor area of the structures before the addition, or 2,500 square feet, whichever is less, as listed in Section 15301(e)(1). Staff has reviewed the proposed facility's layout, existing structures, and project information has determined that the footprint of the emergency generator structure will not exceed 50 percent, or 2,500 square feet, of the floor area of the existing structure.

Since the footprint of the emergency generator is expected not to exceed 50 percent of the floor area of the existing structure, or 2,500 square feet, this project is exempt from the provisions of CEQA and no further CEQA analysis is required.

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

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40 CFR 60, Subpart IIII (*Stationary Compression Ignition Internal Combustion Engines*)

## **National Emissions Standards for Hazardous Air Pollutants (NESHAP)**

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40 CFR 63, Subpart ZZZZ (*Stationary Reciprocating Internal Combustion Engines (RICE)*)

## **Prevention of Significant Deterioration (PSD)**

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This application is not part of a PSD project as defined in Regulation 2-2.

## VIII. 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]*

***End of Conditions***



**IX. 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 triggers the public notification requirements of Regulation 2-1-412. After comments from the public 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 and/or a Permit to Operate for the following equipment:

- S-1    Emergency Standby Diesel Engine**  
**Make: Caterpillar, Model: C15 DITA, 619 bhp**

By: \_\_\_\_\_  
Kristine Ferguson  
Air Quality Engineer

Date: \_\_\_\_\_

## Attachment 1

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT  
 Best Available Control Technology (BACT) Guideline**

**Source Category**

<b>Source:</b>	IC Engine-Compression Ignition: Stationary Emergency, non- Agricultural, non-direct drive fire pump	<b>Revision:</b>	8
		<b>Document #:</b>	96.1.3
<b>Class:</b>	> 50 BHP and < 1000 BHP Output	<b>Date:</b>	12/22/2020*

**Determination**

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
<b>POC (NMHC)</b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for POC at applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>NO<sub>x</sub></b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for NO <sub>x</sub> at applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>SO<sub>2</sub></b>	1. n/s <sup>c</sup> 2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm (wt).	1. n/s <sup>c</sup> 2. CARB Diesel Fuel (Ultra Low Sulfur Diesel)
<b>CO</b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for CO at the applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>PM<sub>10</sub></b>	1. n/s <sup>c</sup> 2. 0.15 g/bhp-hr  3. 0.15 g/bhp-hr	1. n/s <sup>c</sup> 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.
<b>NPOC</b>	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

<b>Emissions Standards for Stationary Emergency Standby Diesel-Fueled CI Engines <math>\geq 50</math> BHP g/Kw-hr (g/bhp-hr)</b>			
<b>Maximum Engine Power</b>	<b>PM</b>	<b>NMHC+NOx</b>	<b>CO</b>
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 < 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)