

DRAFT
ENGINEERING EVALUATION
 Napa Valley High School
 1610 Lincoln Ave., Napa, CA 94559
 Plant Number: 22972
 Application Number: 27038

BACKGROUND

The Applicant has submitted an application for an Authority to Construct for the following:

- S-1 Emergency Standby Diesel Generator Set**
- 2015, Caterpillar Machinery, Model: C7.1**
- EPA Family Name: FPKXL07.0 PW1**
- 225BHP, 2.03 MMBTU/hr**

The engine will be used to provide emergency power for the Napa Valley Unified School District IT center.

S-1 is a new engine generator that the applicant plans to install in the spring of 2015.

EMISSION CALCULATIONS

Criteria Pollutants

Pollutant	Emission Factor	Emissions		
	(g/hp-hr)	Annual (lb/yr)	Annual (TPY)	Maximum Daily (lb/day)
NOx	2.64	65.4	0.033	31.4
NMHC	0.14	3.5	0.002	1.7
CO	0.98	24.3	0.012	11.7
PM10 (diesel particulate)	0.13	3.2	0.002	1.5
SO2	0.0055	0.1	0.000	0.1

Basis:

- 225 hp Max Rated Output – 14.9 gallons/hr Max Fuel Use Rate 2.03 MMBTU/hr Max Combustion Capacity
- The (NO_x+NMHC), CO, and PM10 emission factors are from the Manufacturer’s Performance Data Sheet
 NO_x is assumed to be 95% of (NMHC + NO_x)
 POC is assumed to be 5% of (NMHC + NO_x)
- The SO₂ emission factor is based on 15 ppm sulfur in ULSD fuel derived from EPA AP-42, Table 3.4-1.
- Annual emissions are based on the annual limit (50 hr/yr) of operation for testing and maintenance
- Max daily emissions are based on 24 hr/day since no daily limits are imposed on emergency operations

Toxic Pollutants

The only Toxic Air Contaminant listed on Table 2-5-1 emitted from S-1 is diesel particulate which has a chronic trigger level of 0.34 lb/yr. It is assumed that all of the PM10 is diesel particulate. Based on the above calculations the annual diesel particulate emissions are 3.2 lb/year.

Cumulative Increase

The cumulative increase for criteria pollutants resulting from the planned operation of S-1 at 50 hours per year:

Pollutant	Pre-Existing Cumulative Increase (TPY)	Application Emissions Increase (TPY)	Final Cumulative Increase (TPY)
NOx	0.0	0.033	0.033
POC	0.0	0.002	0.002
CO	0.0	0.012	0.012
PM10	0.0	0.002	0.002

STATEMENT OF COMPLIANCE:**Regulation 2 - Permits, Rule 1 – General Requirements*****Ministerial Projects (Section 2-1-311)***

An application that is classified as ministerial is exempt from the District's CEQA requirements in *Section 2-1-310 Applicability of CEQA*. An application is considered ministerial if the District's engineering evaluation and basis for approval or denial of the permit application for the project is limited to the criteria set forth in *Section 2-1-428 Criteria for Approval of Ministerial Permit Applications* and the specific procedures, fixed standards and objective measurements set forth in the District's Permit Handbook and BACT/TBACT Workbook.

>Section 2.3.1 of the District's Permit Handbook sets forth evaluation guidelines for Stationary Diesel Engines and will be used to evaluate this engine. Section 2 of the District's BACT/TBACT Workbook covers Combustion Sources and will be used to determine BACT/TBACT compliance for this engine. As such, this application is classified as ministerial and S-1 is exempt from District CEQA review.

Public Notice, Schools (Section 2-1-412)

A new or modified source located 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* shall prepare and distribute a public notice in accordance with subsections 412.1 and 412.2 of *Regulation 2, Rule 1 General Requirements*.

>The engine is located on the grounds of a K-12 school and therefore this project is subject to the public notification requirements of this regulation.

Regulation 2 - Permits, Rule 2 – New Source Review***Best Available Control Technology Requirement (Section 2-2-301)***

Any new or modified source that has the potential to emit 10.0 pounds or more per highest day of precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NO_x), sulfur dioxide (SO₂), PM₁₀ or carbon monoxide (CO) is required to use Best Available Control Technology as defined in *Regulation 2-2-206 Best Available Control Technology (BACT)*.

> S-1 triggers BACT for NO_x and CO since the proposed maximum daily emissions of each exceeded the BACT limit of 10 lb/day. BACT for this source is derived from the CARB ATCM Standards and set forth in the *BAAQMD BACT/TBACT Workbook for IC Engine Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document # 96.1.3, Revision 7 dated 12/22/2010*. The more restrictive BACT 1 standard is not applicable to this engine because it will be limited to operation as an emergency standby engine. The BACT 2 emission limit for NO_x is 2.85 g/bhp-hr and for CO is 2.6 g/bhp-hr. According to the engine's Compliance Statement for this engine the NO_x emission rate is 2.64 g/bhp-hr and the CO emission rate is 0.98 g/bhp-hr, both of which are below the BACT 2 emission limits.

Offset Requirements, POC and NOx (Section 2-2-302)

Federally enforceable emission offsets shall be provided for any new or modified source at a facility that will be permitted to emit more than 10 tons/yr of either NO_x or POC.

> Since the facility emissions of NO_x and POC (on a pollutant specific basis) including emissions resulting from the planned operation of S-1 are less than 10 tons/yr, S-1 is not subject to the offset requirements of *Regulation 2-2-302*.

Offset Requirement, PM₁₀ and Sulfur Dioxide, NSR (2-2-303)

Regulation 2-2-303 establishes emission offset requirements for PM₁₀ and Sulfur Dioxide from new or modified sources located at a Major Facility.

>Since this is not a Major Facility, S-1 is not subject to the offset requirements of *Regulation 2-2-302*.

Prevention of Significant Deterioration (PSD) (Section 2-2-304)

New major facilities and major modifications at major facilities must meet modeling requirements of *Regulation 2-2-304 PSD Requirement*.

>This is not a new major facility; nor is it a major modification at a major facility and therefore PSD modeling is not required for this application.

Regulation 2- Permits, Rule 5 New Source Review of Toxic Air Contaminants**General (2-5-100)**

Regulation 2-5-101 –Description states that any new or modified source of toxic air contaminant (TAC) shall be evaluated for potential public exposure and health risk. *Regulation 2-5-110 Exemption, Low Emission Levels* provides an exemption if, for each toxic air contaminant, the increase in emissions from the project is below the trigger levels listed in Table 2-5-1 of Regulation 2-5.

Diesel particulate emissions from the planned operation of S-1 are calculated to be 3.2 lb/year which exceeds the trigger level of 0.34 lb/year. Therefore S-1 is subject to the requirements of this regulation and a health risk screening analysis is required.

>A health risk screening analysis was performed. The results of that analysis indicate that, based on 50 hours on non-emergency use per year, the maximum cancer risk is estimated to be 0.55 in a million and the maximum project chronic hazard index is estimated at 2.0 E-04. In accordance with Regulation 2-5, this is an acceptable risk level since the engine will meet TBACT.

Best Available Control Technology for Toxics (TBACT) Requirement (2-5-301)

TBACT must be applied to any new or modified source of TACs where the risk is a cancer risk greater than 1 in one million, and/or a chronic hazard index greater than 0.2. TBACT for this source is set forth in the *BAAQMD BACT/TBACT Workbook for IC Engine Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document # 96.1.3, Revision 7 dated 12/22/2010* which establishes TBACT for PM10 at 0.15 g/bhp-hr.

>Although TBACT is not triggered, PM10 emissions from S-1 will be 0.11 g/hp-hr which meets the TBACT standard.

Regulation 6 - Particulate Matter, Rule 1 - General Requirements**Ringelmann No. 1 Limitation (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 S-1 will emit a very small amount of PM10 it is expected to comply with *Regulation 6-1-301* pending a regular inspection.

Opacity Limitation (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 District regulations.

>Since S-1 will emit a very small amount of PM10 it is expected to comply with *Regulation 6-1-302* pending a regular inspection.

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

All engines less than 1500 in³ displacement, or any engine used solely as a standby source of motive power must meet the Ringelmann No. 2 Limitations of *Regulation 6-1-303* which states that 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. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree.

>Since S-1 has a displacement of 402.8 in³ it is subject to *Regulation 6-1-303*. The engine is expected to comply with this section 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 S-1 will emit a very small amount of PM10 it is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with *Regulation 6-1-305* pending a regular inspection.

Regulation 9 – Inorganic Gaseous Pollutants, Rule 1 Sulfur Dioxide

S-1 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.

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 NOx 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)

S-1 is subject to the requirements of *Regulation 9-8-330* which limits reliability related operation of the engines to 50 hours per year.

>Permit Conditions for S-1 will include operating limits that meet this standard.

Monitoring and Records (Section 9-8-500)

These engines are subject to the reporting requirements of Sections 502 and 530.

>Permit Conditions for S-1 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 40 CFR Section 60.4200(a)(1)(i) engines are subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines if they have a displacement of less than 30 liters per cylinder where the model year is 2007 or later, for engines that are not fire pump engines. S-1 is a 6 cylinder engine with a total displacement of 7.0 liters, so each cylinder has a volume less than 30 liters and this engine is subject to NSPS

Section 60.4205(b) requires that owners and operators of these engines comply with the emission standards in Section 60.4202, which refers to 40CFR89.112 and 40CFR89.113 for all pollutants.

> S-1 meets the limits for engines between 175 hp and 300 hp, as shown in the table below:

Pollutant	Manufacturer’s Performance Data (g/bhp-hr)	40CFR89.112 Emission Limits (g/bhp-hr)
PM	0.13	0.15
NMHC + NOx	2.78	3.0
CO	0.98	2.6

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engine according to the manufacturer’s written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

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

Section 60.4207(b) requires that by October 1, 2010, the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and a cetane index of 40 or a maximum aromatic content of 35 volume percent.

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

Section 60.4209(a) requires a non-resettable hour meter.

> S-1 will be subject to standard permit conditions that includes this requirement.

> S-1 will comply with the requirements of Section 60.4211(c) because it has been certified in accordance with 40 CFR Part 89 under engine family FPKXL07.OPW1.

> Standard permit conditions limiting operation to 50 hours per year for reliability testing except for operating during emergencies at S-1 ensure that it will comply with the requirement in Section 60.4211(e) which limits such operation to less than 100 hours per year.

Regulation 11 – National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP)

This engine is not subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, because it is not located at a major facility for hazardous air pollutants.

Other Regulations

The District 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 or equal to 175 HP but less than 300 HP.

>S-1 is subject to and meets the requirement of this section of the ATCM as shown in the table below:

Pollutant	Manufacturer’s Performance Data Sheet Emission Rate (g/bhp-hr)	ATCM Emission Standards (g/bhp-hr)
PM	0.13	0.15
NMHC + NOx	2.78	3.0
CO	0.98	2.6

Subsection 93115(a)(3)(A)(1)(b) requires that new stationary emergency standby diesel-fueled engines (>50bhp) be certified to the emission standards as specified in *40 CFR, Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*.

>The Manufacturer’s Specification Sheet shows that S-1 has been certified to meet EPA Tier 3 standards and therefore, S-1 complies with this section of the ATCM.

Subsection 93115(a)(3)(A)(1)(c) limits the non-emergency operation of 50 hours/year for maintenance and testing.

>Permit Conditions for S-1 will limit non-emergency operation to 50 hours/year and as such S-1 will comply with this section of the ATCM.

CONDITIONS

I recommend the following permit condition for S-1:

COND# 22850 -----

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.
[Basis: "Regulation 2-5]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
4. Records: The owner/operator shall maintain the following monthly records in a District approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
 - a. Hours of operation for reliability-related activities (maintenance and testing).
 - b. Hours of operation for emission testing to show compliance with emission limits.
 - c. Hours of operation (emergency).
 - d. For each emergency, the nature of the emergency condition.
 - e. Fuel usage for each engine(s).
 [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

- 5. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

- a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
- b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

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

RECOMMENDATIONS:

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 emit a toxic air contaminant in excess of the Table 2-5-1 trigger level and will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412.6. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

- S-1 Emergency Standby Diesel Generator Set
2015, Caterpillar Machinery, Model: C7.1
EPA Family Name: FPKXL07.0 PW1
225 BHP, 2.03 MMBTU/hr**

Anne C Werth

April 28, 2015