

Draft Engineering Evaluation Report

Sutter Health, Plant #23131
1101 Van Ness Avenue, San Francisco, CA
Application #27284

Background

Sutter Health (“Applicant”) operates a hospital, located at 1101 Van Ness Avenue, in San Francisco (Plant #23131). The Applicant has requested an Authority to Construct permit for new emergency standby diesel-fired gensets, hot water boilers, and steam boilers at this facility.

S-1, S-2, S-3	3000 kW Caterpillar Emergency Standby Genset
S-4, S-5, S-6, S-7	16.53 MMBtu/hr Heating Hot Water Boiler
S-8, S-9, S-10	3.75 MMBtu/hr High Pressure Steam Boiler

All of the boilers will use fuel oil as backup in the event there is a natural gas curtailment. This is a brand new hospital that has yet to be built.

Criteria Pollutant Emission Calculations

S-1, S-2, S-3

These emergency standby, diesel-fired IC engines (S-1, S-2, S-3) are EPA certified to meet the Tier 2 standards that apply to engines with an output rating greater than 750 bhp. The certified emission rates for this engine and equivalent outlet emission concentrations for the engines are presented in Table 1. Each engine is equipped with a diesel particulate filter and oxidation catalyst which reduce PM₁₀, CO, and HC emissions by at least 85% per the manufacturer. Maximum daily and annual emissions from the engines are presented in Table 2 (while burning CARB certified diesel oil).

TABLE 1
Emission Rates from S-1, S-2, S-3

Pollutant	g/bhp-hr	g/hr	lbs/hr	ppmv @ 15% O2	grains/dscf @ 0% O2
HC (POC)	0.01	44.23	0.0975	2.4	
NOx	4.17	18,443.91	40.6612	350.7	
CO	0.18	796.14	1.7552	24.9	
PM10	0.01	44.23	0.0975		0.0025
SO2	0.0047	20.79	0.0458	0.3	

TABLE 2
Criteria Pollutant Emissions For Engines S-1, S-2, S-3 (while burning CARB diesel oil)

Pollutant	g/bhp-hr	hours/day	Emissions pounds/day	hours/year	Emissions tons/year	Total Emissions tons/year
HC (POC)	0.01	24	2.34	50	0.0024	0.0072
NO _x	4.17	24	975.87	50	1.0165	3.0495
CO	0.18	24	42.12	50	0.0439	0.1317
PM ₁₀	0.01	24	2.34	50	0.0024	0.0072
SO ₂	0.0047	24	1.10	50	0.0011	0.0033

Sulfur dioxide emissions were determined based of the maximum sulfur content for CARB certified diesel fuel (0.0015% S, by weight) and the maximum fuel usage rate for this engine (213.2 gallons/hour).

S-4, S-5, S-6, S-7

The emissions of NO_x and CO have been calculated based on the Regulation 9 Rule 7 Section 307.3 emission limit of 15 ppmv NO_x and BACT limit of 100 ppmv CO, dry at 3% oxygen. The emissions of PM, SO_x, and POC have been based on emission factors from EPA's AP-42, Compilation of Air Pollutant Emission Factors, Volume 1, Chapter 1.4, External Combustion Sources, Natural Gas Combustion, Table 1-4.2.

The emissions from the boiler at full operating capacity have been calculated on the attached spreadsheet and summarized in Table 3, below.

TABLE 3
Criteria Pollutant Emissions For Boilers, S-4, S-5, S-6, S-7

Source	PM ₁₀	POC	NO _x	SO ₂	CO
S-4, S-5, S-6, S-7 (lb/day)	3.0	2.1	7.2	0.2	29.4
S-4, S-5, S-6, S-7 (lb/year)	1,079	781	2,635	85	10,715
S-4, S-5, S-6, S-7 (ton/year)	0.540	0.391	1.318	0.043	5.358
Total (ton/year)	2.160	1.564	5.272	0.172	21.432

S-8, S-9, S-10

The emissions of NO_x and CO have been calculated based on the Regulation 9 Rule 7 Section 307.1 emission limit of 30 ppmv NO_x and a manufacturer guaranteed limit of 150 ppmv CO, dry at 3% oxygen. The emissions of PM, SO_x, and POC have been based on emission factors from EPA's AP-42, Compilation of Air Pollutant Emission Factors, Volume 1, Chapter 1.4, External Combustion Sources, Natural Gas Combustion, Table 1-4.2.

The emissions from the boiler at full operating capacity have been calculated on the attached spreadsheet and summarized in Table 4, below.

TABLE 4
 Criteria Pollutant Emissions For Boilers, S-8, S-9, S-10

Source	PM ₁₀	POC	NO _x	SO ₂	CO
S-8, S-9, S-10 (lb/day)	0.7	0.5	3.2	0.1	9.9
S-8, S-9, S-10 (lb/year)	245	177	1,183	19	3,614
S-8, S-9, S-10 (ton/year)	0.123	0.089	0.592	0.010	1.807
Total (ton/year)	0.369	0.267	1.776	0.030	5.421

Cumulative Increase

The District tracks increases in emissions from each facility. These cumulative emissions were reset on April 5, 1991 for all facilities. The emissions summarized above will be added to the cumulative emission increases for this facility, as shown below in Table 5.

TABLE 5
 Cumulative Emission Increases, Plant #23131 (tons per year)

Pollutant	Existing (New Plant)	Proposed Project	Post-Project
PM ₁₀	0	2.536	2.536
POC	0	1.838	1.838
NO _x	0	10.098	10.098
SO ₂	0	0.205	0.205
CO	0	26.985	26.985

Statement of Compliance

Regulation 1: General Provisions and Definitions

All sources are subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance.

S-1, S-2, S-3

The proposed emergency diesel engine has very low particulate emissions and is not expected to be a source of public nuisance.

S-4, S-5, S-6, S-7, S-8, S-9, S-10

The proposed boilers are not expected to be a source of public nuisance.

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements

District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with the California Environmental Quality Act (CEQA) requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312.

On April 26, 2012, the City and County of San Francisco Planning Commission by Motion No. 18588, found that the Final EIR was adequate, accurate, and objective, reflected the independent judgment of the Planning Commission, and that the

Comments & Response document contained no significant revisions to the Draft EIR, certified the completion of the Final EIR for the Project in compliance with CEQA, and the CEQA Guidelines and Chapter 31 of the Administrative Code.

In addition, the engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.1, Boilers, Steam Generators, and Process Heaters and Chapter 2.3.1, Combustion Equipment – Internal Combustion Engines, Stationary Diesel Engines. Therefore, the requirements of CEQA has been satisfied for this project.

Regulation 2, Rule 1: School Public Notice Requirements

The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. The project is within 1,000 feet of the boundary of a K-12 school and therefore is subject to the public notification requirements of Reg. 2-1-412. Notifications will be distributed to parents or guardians of students enrolled at Sacred Heart Cathedral Preparatory, and all residential and business neighbors within 1,000 feet of the proposed new source.

Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements

S-1, S-2, S-3

Regulation 2, Rule 2, Section 301 states that BACT requirements are triggered if maximum potential emissions from a new or modified source will be 10 pounds/day or more of NO_x, CO, POC, NPOC, PM₁₀, or SO₂. As shown in Table 2, the emissions from S-1, S-2, S-3 could exceed 10 pounds/day for NO_x and CO emissions. Therefore, BACT is required for these pollutants.

The BACT/TBACT Workbook Document 96.1.3 - dated 12/22/2010 - applies to emergency standby compression ignition internal combustion engines larger than 50 hp. The standards for BACT1 (technologically feasible/cost effective) and BACT2 (achieved in practice) for NO_x and CO emissions from emergency standby engines is summarized in Table 6.

TABLE 6
 BACT for Emergency Standby Compression Ignition Engines > 50 hp
 (Document # 96.1.3)

Pollutant	BACT1 / TBACT	Typical Technology	BACT2	Typical Technology	Certified Emissions
NO _x	Not Specified	Not Specified	CARB ATCM standard for applicable horsepower: 4.8 g/bhp-hr NMHC+NOx	Any engine certified or verified to meet the standard	4.18 g/bhp-hr NMHC+NOx
CO	Not Specified	Not Specified	CARB ATCM standard for applicable horsepower: 2.6 g/bhp-hr CO	Any engine certified or verified to meet the standard	0.18 g/bhp-hr CO

NO_x and CO BACT:

As shown in Table 6, there are no specified BACT1 standards for NO_x and CO emissions from emergency compression ignition engines. Therefore, the engines will be allowed to comply with BACT by meeting the BACT2 standards in Table 6. The proposed engines are EPA certified to have a NMHC+NO_x emission rate of 4.18 g/bhp-hr and CO emission rate of 0.18 g/bhp-hr, which complies with the Tier 2 NMHC+NO_x standard of 4.8 g/bhp-hr and CO standard of 2.6 g/bhp-hr.

S-4, S-5, S-6, S-7

Under Regulation 2, Rule 2, any new source which results in an increase of 10 lbs/day or more of any criteria pollutant must be evaluated for adherence to BACT and TBACT control technologies. Based on Table 3 above, boilers S-4, S-5, S-6, S-7 will emit more than 10 lbs/day of CO emissions, and is subject to BACT limitations.

The BACT/TBACT Workbook Document 17.1.1 - dated 8/4/2010 - applies to boilers 5 MMBtu/hr to < 33.5 MMBtu/hr Heat Input. The standards for BACT1 (technologically feasible/cost effective) and BACT2 (achieved in practice) for CO emissions from boilers is summarized in the table below.

TABLE 7
BACT for Boilers 5 MMBtu/hr to < 33.5 MMBtu/hr Heat Input (Document # 17.1.1)

Pollutant	BACT1	Typical Technology	BACT2	Typical Technology	S-4, S-5, S-6, S-7 Emissions
CO	50 ppmv @ 3% O ₂ Dry	Good Combustion Practice	50 ppmv @ 3% O ₂ Dry, for Firetube Boilers; 100 ppmv @ 3% O ₂ Dry, for Watertube Boilers	Good Combustion Practice	100 ppmv @ 3% O ₂ , Dry

For small boilers (less than 33.5 MM BTU/hr), BACT requires that watertube boilers meet emissions limitations of 100 ppmv at 3% oxygen, dry, for CO emissions. Regulation 9, Rule 7 requires that boilers with a firing rate between 10 and 20 MM BTU/hour meet a NO_x limitation of 15 ppmv at 3% O₂, dry, and a CO limitation of 400 ppmv at 3% O₂, dry, when firing natural gas. The boiler manufacturer guarantees that the boiler will meet the required NO_x and CO emission limitation.

The boilers are not subject to TBACT, as all toxic emissions from the project are below the chronic and acute trigger levels for those pollutants as listed in Regulation 2, Rule 5, Table 2-5-1, in accordance with Regulation 2-5-110.

Regulation 2, Rule 2: Offsets

The cumulative emission increases for this site and this application are summarized below.

TABLE 8
Offsets Calculation (tons per year)

	Current Balance tons/year	Application Increases tons/year	Offset Ratio / Offsets Required	New Balance tons/year
POC	0	2.536	NA	2.536
NOx	0	1.838	NA	1.838
CO	0	10.098	NA	10.098
PM10	0	0.205	NA	0.205
SO2	0	26.985	NA	26.985

The offset requirements for precursor organic compounds (POC) and nitrogen oxides (NOx) are found in Regulation 2, Rule 2, Section 302. Under Section 2-2-302, POC and NOx emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NOx per year, the emission offsets may be provided by the District's Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NOx, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

Since the criteria pollutant emissions from this site are less than the offset threshold for each pollutant, offsets are not required.

Regulation 2, Rule 5: Health Risk Assessment Requirements

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants. All toxic air contaminants (TAC) emissions from new and modified sources are subject to risk assessment review, if emissions of any individual TAC from the project exceed the acute or chronic emission thresholds specified in Table 2-5-1 of Regulation 2, Rule 5.

S-1, S-2, S-3

Operation of the standby diesel engines will result in emissions of diesel particulate matter (PM), a toxic air contaminant. From Table 2-5-1, diesel PM does not have an acute trigger level, but it does have a chronic trigger level of 0.34 pounds/year. Based on the proposed operating rate of 50 hours/year, each engine will emit 4.9 pounds/year of diesel PM, which exceeds the chronic trigger level. Therefore, this project requires a health risk screening analysis.

The risk screen was conducted using the ISCST3 air dispersion model with Screen3 meteorological data. Health risks were calculated using the District's standard assumptions for resident, worker, and infant, children, and adolescent receptors and current OEHHA health effects values for diesel PM. Detailed explanations of the modeling procedures and health risk calculation assumptions are provided in the attached HRSA report for this application. The health risks for the total project are summarized in Table 9.

TABLE 9
 Summary of Source and Project Health Risks

Receptor	Cancer Risk	Chronic Hazard Index
Residential	0.52 chances in a million	0.00077
Student (Sacred Heart Cathedral Preparatory)	0.042 chances in a million	0.00008

Since the maximum cancer risk for the project will not exceed 1 in a million and the chronic hazard index will not exceed 0.2, TBACT is not required per Regulation 2-5-301. Since the project risk limit does not exceed 10 in a million cancer risk or 1.0 chronic hazard index, this project will satisfy the Regulation 2-5-302 project risk limits.

S-4, S-5, S-6, S-7, S-8, S-9, S-10

Toxic air pollutants will be emitted by the boilers under review. The toxic pollutant emissions will be as follows:

TABLE 10
 Toxic Pollutant Emissions
 Chronic Emissions

POLL	POLL NAME	Project Emissions lb/yr	Chronic Trigger Level (lb/yr)	Chronic EMS > Trigger Level?
41	Benzene	1.40	3.80	NO
124	Formaldehyde	49.84	18.00	YES
293	Toluene	2.26	12000.00	NO

Acute Emissions

POLL	POLL NAME	Project Emissions lb/hr	Acute Trigger Level (lb/hr)	Acute EMS > Trigger Level?
41	Benzene	1.59E-04	2.90	NO
124	Formaldehyde	5.69E-03	0.12	NO
293	Toluene	2.58E-04	82.00	NO

Since the chronic toxic pollutant emissions for formaldehyde emissions exceed the trigger levels set in Regulation 2, Rule 5 on the date that the application was deemed complete by the District, a health risk assessment is required for this project.

**Major Facility Review, Regulation 2, Rule 6
40 CFR Part 70, State Operating Permit Programs (Title V)**

The Title V federal permitting requirements of 40 CFR Part 70 have been codified and are enforced through District Regulation 2, Rule 6. This regulation applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and other designated facilities. This facility is not a Phase II acid rain facility, subject solid waste incinerator, or other designated source category. It is not a major facility since the potential emissions are less than the major source thresholds for regulated air pollutants and hazardous air pollutants. This facility is not subject to Regulation 2, Rule 6 or 40 CFR, Part 70.

Regulation 6, Rule 1, “Particulate Matter – General Requirements”

S-1, S-2, S-3

The emergency standby diesel engines are subject to Regulation 6, Rule 1. Since the engine displacement is greater than 1500 cubic inches, Section 6-1-301 applies instead of 6-1-303. Section 6-1-301 limits visible emissions to not exceed Ringelmann 1 for periods aggregating more than 3 minutes in any hour or equivalent opacity. Section 6-1-305 prohibits public nuisance caused by fallout of visible particulate emissions. Properly operating diesel engines are not expected to produce visible emissions or fallout in violation of these sections.

Section 6-1-310 limits particulate emissions to 0.15 grains/dscf of exhaust gas volume. The particulate emission rate from these IC engines is 0.01 grams per bhp-hour, which result in an outlet grain loading of 0.0025 grains per dscf at 0% O₂. This emission rate is less than the limit in Section 6-1-310, so compliance with this section is ensured.

S-4, S-5, S-6, S-7, S-8, S-9, S-10

The boilers are subject to and will comply with Regulation 6, Rule 1, since it will be burning natural gas only. From AP 42, Section 1-4, default PM₁₀ emissions for natural gas are estimated at 7.6 E-6 lb/dscf of natural gas burned, which equates to an outlet grain loading of 0.006 gr/dscf of exhaust at 0% O₂. This rate is well below the Regulation 6-1-310 limit of 0.15 gr/dscf.

Regulation 9, Rule 1, “Inorganic Gaseous Pollutants – Sulfur Dioxide”

S-1, S-2, S-3

These emergency standby diesel engines are subject to Regulation 9, Rule 1. The engines burn diesel fuel and are subject to Section 9-1-304, which prohibits burning of fuel containing more than 0.5% sulfur by weight. The facility is expected to comply with this requirement since only CARB-certified diesel fuel is allowed for use in California with a maximum sulfur content of 0.0015% by weight.

Regulation 9-1-302 limits the SO₂ concentration in any exhaust stack to 300 ppmv at the as found oxygen concentration. These engines are expected to emit less than 1 ppmv of SO₂ due to combustion of low sulfur CARB diesel oil.

S-4, S-5, S-6, S-7, S-8, S-9, S-10

The boilers are subject to and will comply with Regulation 9, Rule 1, "Inorganic Gaseous Pollutants, Sulfur Dioxide," by combustion of natural gas only. Combustion of natural gas is expected to produce a SO₂ concentration of no more than 2 ppmv of SO₂, thereby meeting the requirement of a maximum ground level concentration of 300 ppmv of SO₂, prescribed in Regulation 9-1-110.

Regulation 9, Rule 7, "Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters"

S-4, S-5, S-6, S-7

During natural gas firing, the boilers will meet the following emission limits: 15 ppmv of NO_x and 100 ppmv of CO in exhaust gases corrected to 3% O₂, dry basis per the manufacturer guarantee. These boiler emission limits comply with the NO_x and CO emission limitations of Regulation 9, Rule 7 Section 307.3 which are 15 ppmv of NO_x and 400 ppmv of CO corrected to 3% O₂, dry basis.

The boilers need to meet the insulation requirements of Section 9-7-311 and the stack gas temperature limits of Section 9-7-312. The applicant has indicated the boilers are insulated with at least one inch of insulation which meets the rule requirement of at least one inch of insulation and all other surfaces must remain accessible for maintenance and inspection. The boiler operates at a stack exhaust temperature 400 degrees F with a saturated steam temperature of 331 degrees F which meets the rule requirement for watertube units of the stack gas temperature not being 150°F over the saturated steam temperature for a steam boiler.

S-8, S-9, S-10

During natural gas firing, the boilers will meet the following emission limits: 30 ppmv of NO_x and 150 ppmv of CO in exhaust gases corrected to 3% O₂, dry basis per the manufacturer guarantee. These boiler emission limits comply with the NO_x and CO emission limitations of Regulation 9, Rule 7 Section 307.1 which are 30 ppmv of NO_x and 400 ppmv of CO corrected to 3% O₂, dry basis.

The boiler needs to meet the insulation requirements of Section 9-7-311 and the stack gas temperature limits of Section 9-7-312. The applicant has indicated the boiler are insulated with at least one inch of insulation which meets the rule requirement of at least one inch of insulation and all other surfaces must remain accessible for maintenance and inspection. The boiler operates at a stack exhaust temperature 350 degrees F with a hot water temperature of 200 degrees F which meets the rule requirement for watertube units of the stack gas temperature not being 150°F over the hot water temperature for a hot water boiler.

Regulation 9, Rule 8: Inorganic Gaseous Pollutants – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

S-1, S-2, S-3

Regulation 9, Rule 8 applies to stationary internal combustion engines with a rated output greater than 50 bhp. The engines have a rated capacity of 4,423 bhp and are subject to this rule. However, emergency standby engines are exempt from the emission limits in this rule pursuant to section 9-8-110.5. Emergency engines are subject to the Regulation 9-8-330.3 operating time limit of 50 hours/year and to record keeping requirements in Section 9-8-502.1. The engines will be subject to permit conditions limiting the operating time to 50 hours/year and requiring records to demonstrate compliance.

Airborne Toxic Control Measure for Stationary Compression Ignition Engines, Section 93115, Title 17, CA Code of Regulations

These emergency diesel engines are subject to the California Air Resources Board Air Toxic Control Measure (ATCM) for stationary compression ignition engines since they are compression ignition (diesel-fuelled) engines with a rating greater than 50 brake horsepower, and do not meet any of the exemptions in Section 93115.3. They are considered new stationary compression ignition engines, since they were installed after January 1, 2005 and are considered an emergency engine because they meet the definition of emergency standby use.

Section 93115.5, Fuel Restrictions: These engines are subject to the fuel use restriction in Section 93115.5(a). Compliance with this requirement is expected, as the owner/operator will be limited to use of CARB diesel fuel by permit condition.

Section 93115.6, Emission Standards: The applicable emission standards for these stationary emergency diesel engines are in Section 93115.6(a). Section 93115.6(a)(3)(A)(1)(b) requires that these engines be certified to meet the new nonroad compression ignition engine emission standards specified in 40, CFR Part 60, Subpart IIII. For these engines, the applicable limits are: 0.15 g/bhp-hr for PM, 4.8 g/bhp-hr for NMHC+NO_x, and 2.6 g/bhp-hr for CO. Section 93115.6(a)(3)(A)(1)(c) limits operating time for maintenance and testing purposes to 50 hours/year. The engines are EPA certified and are expected to comply with all applicable operating time limitations.

Section 93115.10, Recordkeeping, Reporting, and Monitoring Requirements: Section 93115.10(a) requires the owner/operator to provide information on any new stationary compression ignition engine greater with capacity greater than 50 hp to the District, prior to installation of the new engine. This application was submitted to provide the required data.

Section 93115.10(c) requires the owner/operator to provide emission data to the District to demonstrate compliance with the applicable emission limits under this rule. The Applicant has provided emission data demonstrating compliance with all applicable limits.

Section 93115.10(e) requires installation of a non-resettable hour meter with a minimum display capability of 9,999 hours upon engine installation. Installation and operation of this meter will be required by permit condition.

Section 93115.13, Compliance Demonstration: Section 93115.13(a)(1) states that off-road engine certification test data for the stationary diesel engine is acceptable for demonstrating compliance with this rule. The engines have been shown to comply with all applicable limits through the engine certification. Therefore, no additional testing is necessary.

**40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS):
 Subpart A, Standards of Performance for New Stationary Sources – General Provisions**

Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR Part 60, Subpart IIII applies to compression ignition engines. Per Section 60.4200(a)(2), a stationary compression ignition engine manufactured after April 1, 2006, other than fire pump engines, and for which construction commenced after July 11, 2005 is subject to this rule. The engines meet these applicability criteria and are subject to this rule.

Emission Standards: Section 60.4205(b) specifies the emission standards for stationary emergency CI internal combustion engines of 2007 model year and later with less than 30 liters per cylinder. These engines have a model year later than 2007 with 16 cylinders and a total displacement of 5,167 in³ (84.67 L), or 5.29 liters per cylinder. 40 CFR Part 1039.101-102, 1039.104-105, 1039.107, and 1039.115 for model year 2014 and later identifies the applicable limits for these engines, which are summarized in Table 10.

TABLE 11
 40 CFR Part 60, Subpart IIII Emission Standards
 (>450 kW engines, Tier 2, Model Year 2007+)

	PM, g/kW-hr	HC+NOx, g/kW-hr	CO, g/kW-hr
Emission Standard	0.20	6.4	3.5
Certified Emissions	0.013	5.6	0.24

Section 89.113 contains smoke emission standards. Section 89.113(a) limits exhaust opacity to no more than 20% during acceleration, 15% during lugging, and 50% during peaks in either mode. Section 89.113(b) requires opacity levels to be measured as specified in 40 CFR Part 86, Subpart I. Demonstration of compliance with these opacity standards was required for engine certification.

Section 60.4206 requires compliance with these emission standards over the entire life of the engine.

Operating Restrictions: Beginning October 1, 2007, Section 60.4207(a) limits fuel use to diesel fuel meeting the requirements of 40 CFR 80.510(a). Part 80.510(a) limits the sulfur content of diesel fuel to 500 ppmw and cetane index to 40 or maximum aromatic content to 35%, by volume. As of October 1, 2010, for an internal combustion engine with a displacement of less than 30 liters per cylinder, the maximum sulfur content of allowable fuel will be reduced to 15 ppmw (40 CFR 80.510(b) for nonroad diesel fuel). CA diesel fuel is limited to 15 ppmw sulfur and 10% by volume aromatic content. As CA diesel is mandated for use in California, compliance with these federal fuel restrictions is expected.

Monitoring, Recordkeeping, Reporting: Section 60.4209 requires installation of a non-resettable hour meter prior to startup of the engine. Permit conditions will require installation and operation of this monitor.

Compliance Requirements: Section 60.4211(a) requires operation of the engine according to the manufacturer's instructions and Parts 89, 94, and/or 1068 if applicable. Part 89 applies to non-road engines subject to Part 61, Subpart IIII, but contains only general provisions and does not specify additional engine operating restrictions. Part 94 applies to marine engines and Part 1068 applies to manufacturers of nonroad engines, therefore neither applies. Operation in compliance with the manufacturer's instructions will be included in the permit conditions for this source.

Section 60.4211(c) requires 2007 model year and later engines to be certified to comply with the emission standards in 60.4205(b) and installed and configured per the manufacturer's specifications. The EPA-certified emissions have been summarized in Table 11 above and comply with the emission standards of this rule.

40 CFR Part 60, Subpart A, Standards of Performance for New Stationary Sources (NSPS) – General Provisions
40 CFR Part 60, Subpart Dc, Standards of Performance for New Stationary Sources (NSPS) – Small Industrial-Commercial-Institutional Steam Generating Units

S-4, S-5, S-6, S-7

The boilers are subject to the NSPS for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR, Part 60, Subpart Dc, because each boiler will be installed after June 9, 1989 and will have a heat input capacity between 10 MM BTU/hour and 100 MM BTU/hour.

The boilers are not subject to SO₂ emission limits under 40 CFR Part 60.42c, since they does not burn coal or fuel oil. The PM₁₀ emission limits under 40 CFR Part 60.43c do not apply since the boilers do not burn coal, fuel oil, or wood.

The boilers are subject to only the initial notification requirements pursuant to 40 CFR Part 60.48c(a). The owner/operator is also required to maintain monthly records of fuel delivered to the unit pursuant to 40 CFR Part 60.48c(g)(2) or (3). The Applicant is expected to comply with these requirements.]

40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories/Maximum Achievable Control Technology (MACT) Standards: Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants – for Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63, Subpart ZZZZ applies to stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This facility is not a major source of HAP emissions, and is therefore an area source of HAP emissions. As the engines have a capacity greater than 500 bhp and will be installed after June 12, 2006, the source is considered a new source under this subpart. Section 63.6590(c) specifies that an affected source that is a new or reconstructed, compression ignition, stationary RICE located at an area source must meet the requirements of this subpart by meeting the requirements of 40 CFR Part 60, Subpart IIII. No other requirements apply under this subpart. Therefore, the engines comply with this Subpart ZZZZ by complying with Subpart IIII, which was addressed above.

40 CFR Part 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, Institutional Boilers and Process Heaters

40 CFR Part 63, Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

The NESHAP for Industrial-Commercial-Institutional Boilers and Process Heaters, 40 CFR, Part 63, Subpart DDDDD applies to boilers located at a facility is a major source of HAPs. Since this facility is not major for HAPs, this regulation does not apply to the proposed boilers at this site.

On February 23, 2011, EPA issued a final rule to limit HAP emissions from new and existing industrial, commercial, and institutional boilers and process heaters located at area source facilities (sites that are not major sources of HAPs), 40 CFR, Part 63, Subpart JJJJJJ. This rule explicitly excludes “gas-fired” boilers and process heaters (§63.11195(e) and §63.11237). Therefore, the natural gas-fired boilers at this facility are not subject to this rule.

S-1, S-2, S-3

Permit Condition #22850

Condition #22850 setting out the operating and recordkeeping requirements for the operation at each source shall be made a part of the source's Authority to Construct.

COND# 22850

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-

related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

- a. Hours of operation for reliability-related activities (maintenance and testing).
- b. Hours of operation for emission testing to show compliance with emission limits.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition.
- e. Fuel usage for each engine(s).

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

5. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply: The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

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

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

S-4, S-5, S-6, S-7

Permit Condition #26145

Condition #26145 setting out the operating and recordkeeping requirements for the operation at each source shall be made a part of the source's Authority to Construct.

COND# 26145

1. The permit holder shall burn only natural gas at each boiler except during periods of natural gas curtailment or during testing to verify readiness for such a curtailment, provided that all of the following conditions are met:

- a. Each boiler does not burn non-gaseous fuel for more than 168 total hours in each consecutive 12-month period, plus 48 hours in each consecutive 12-month period for oil-burn readiness testing or state, federal or local agency required performance testing.
- b. Each boiler does not exceed a NO_x exhaust concentration of 150 ppmv, dry at 3 percent oxygen, and
- c. The records specified in Section 9-7-503.3 are maintained.

[Basis: Cumulative Increase]

2. The permit holder shall not use more than 1,448,028 therms of natural gas at each boiler during any consecutive twelve-month period. [Basis: Cumulative Increase]

3. The permit holder shall ensure that NO_x emissions from each boiler do not exceed 15 ppmv at 3% oxygen, dry basis, when firing natural gas. [Basis: Cumulative Increase, 9-7-307.3]

4. The permit holder shall ensure that CO emissions from each boiler do not exceed 100 ppmv at 3% oxygen, dry basis, when firing natural gas. [Basis: Cumulative Increase, BACT]

5. Within 60 days of start-up, the applicant shall conduct an initial demonstration of compliance with the above emissions limitations. All source testing shall be done in compliance with the District's Manual of Procedures. The applicant shall obtain approval from the Manager of the District's Source Test Section for the installation of test ports and source test procedures. The source test results shall be submitted to the District's Director of Compliance and Enforcement no later than 30 days from the date of the source test. [Basis: Regulation 9-7-403]

6. To demonstrate compliance with the above, the permit holder shall initiate periodic emissions testing of the boilers at least once every calendar year. Such testing may be conducted either by source testing performed in compliance with the District's Manual of Procedures, or by use of a portable analyzer that meets the specifications and testing protocols set out in Regulation 9, Rule 7-606. [Basis: Regulation 9-7-506]

7. To demonstrate compliance with the above, the permit holder shall install and maintain a non-resettable totalizing fuel meter, unless the permit holder applies for and

receives written approval from the District to use an alternative method for measuring the cumulative annual fuel usage. [Basis: Regulation 9-7-504.1, Cumulative Increase]

8. The permit holder shall maintain records of the following:
 - a. Original Manufacture Date and Initial Startup Date for the boiler;
 - b. Total monthly natural gas usage for the boiler and a summary of natural gas usage in therms for the boiler for each consecutive rolling twelve-month period;
 - c. Average Higher Heating Value (HHV) of the natural gas fired in the boilers for the most recent rolling 12-month period;
 - d. Copies of all notifications submitted pursuant to Regulation 9, Rule 7 and 40 CFR Part 60, Subpart Dc.
 - e. Copies of the results of all monitoring and source testing events conducted at each boiler.

The permit holder shall retain these records for at least two years from date of entry and shall make these records available to District staff upon request. [Basis: Cumulative Increase; Regulation 9, Rule 7]

S-8, S-9, S-10

Permit Condition #26146

Condition #26146 setting out the operating and recordkeeping requirements for the operation at each source shall be made a part of the source's Authority to Construct.

COND# 26146

1. The permit holder shall burn only natural gas at each boiler except during periods of natural gas curtailment or during testing to verify readiness for such a curtailment, provided that all of the following conditions are met:
 - a. Each boiler does not burn non-gaseous fuel for more than 168 total hours in each consecutive 12-month period, plus 48 hours in each consecutive 12-month period for oil-burn readiness testing or state, federal or local agency required performance testing.
 - b. Each boiler does not exceed a NO_x exhaust concentration of 150 ppmv, dry at 3 percent oxygen, and
 - c. The records specified in Section 9-7-503.3 are maintained.

[Basis: Cumulative Increase]

2. The permit holder shall not use more than 328,500 therms of natural gas at each boiler during any consecutive twelve-month period. [Basis: Cumulative Increase]

3. The permit holder shall ensure that NO_x emissions from each boiler do not exceed 30 ppmv at 3% oxygen, dry basis, when firing natural gas. [Basis: Cumulative Increase, 9-7-307.1]

4. The permit holder shall ensure that CO emissions from each boiler do not exceed 150 ppmv at 3% oxygen, dry basis, when firing natural gas. [Basis: Cumulative Increase]

5. Within 60 days of start-up, the applicant shall conduct an initial demonstration of compliance with the above emissions limitations. All source testing shall be done in compliance with the District's Manual of Procedures. The applicant shall obtain approval from the Manager of the District's Source Test Section for the installation of test ports and source test procedures. The source test results shall be submitted to the District's Director of Compliance and Enforcement no later than 30 days from the date of the source test. [Basis: Regulation 9-7-403]

6. To demonstrate compliance with the above, the permit holder shall initiate periodic emissions testing of the boilers at least once every calendar year. Such testing may be conducted either by source testing performed in compliance with the District's Manual of Procedures, or by use of a portable analyzer that meets the specifications and testing protocols set out in Regulation 9, Rule 7-606. [Basis: Regulation 9-7-506]

7. To demonstrate compliance with the above, the permit holder shall install and maintain a non-resettable totalizing fuel meter, unless the permit holder applies for and receives written approval from the District to use an alternative method for measuring the cumulative annual fuel usage. [Basis: Regulation 9-7-504.1, Cumulative Increase]

8. The permit holder shall maintain records of the following:
- a. Original Manufacture Date and Initial Startup Date for the boiler;
 - b. Total monthly natural gas usage for the boiler and a summary of natural gas usage in therms for the boiler for each consecutive rolling twelve-month period;
 - c. Average Higher Heating Value (HHV) of the natural gas fired in the boilers for the most recent rolling 12-month period;
 - d. Copies of all notifications submitted pursuant to Regulation 9, Rule 7 and 40 CFR Part 60, Subpart Dc.
 - e. Copies of the results of all monitoring and source testing events conducted at each boiler.

The permit holder shall retain these records for at least two years from date of entry and shall make these records available to District staff upon request. [Basis: Cumulative Increase; Regulation 9, Rule 7]

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 Authorities to Construct for the equipment listed below. However, the proposed sources will be located within 1,000 feet of the boundary of a K-12 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 Authorities to Construct for the following sources:

S-1, S-2, S-3	3000 kW Caterpillar Emergency Standby Genset
S-4, S-5, S-6, S-7	16.53 MMBtu/hr Heating Hot Water Boiler
S-8, S-9, S-10	3.75 MMBtu/hr High Pressure Steam Boiler

Stanley Tom, P.E.
Air Quality Engineer

Date

Application # 27277
Plant # 23127

Emissions from a Proposed New Emergency Standby Diesel Engine (S-1, S-2, S-3)

IC Engine, diesel fired,
emergency

4423	bhp
213.2	gals/hr of diesel oil
140,000	BTU/gallon
29.848	MM BTU/hour
9190	dscf/MM BTU (0% O ₂)
385.5	scf/lbmol
3	# of engines

Proposed Operating Times

as Emergency Engine:

24	hours/day
1	days/week
12	weeks/year
12	days/year
50	hours/year
10660	gals/year of diesel

Certified Emission Rates:

HC	0.16	g/bhp-hr
NOx	4.17	g/bhp-hr
CO	1.30	g/bhp-hr
PM	0.07	g/bhp-hr
S	0.0015%	in fuel

Toxic Air Contaminants	Emission Factor, g/bhp-hr	Hourly Source Emissions, lbs/hr	Annual Source Emissions, lbs/yr	Hourly Project Emissions, lbs/hr	Annual Project Emissions, lbs/yr	Acute Trigger Level, lbs/hr	Chronic Trigger Level, lbs/yr	HRA Required For Acute?	HRA Required For Chronic?	TAC Surcharge Required For Chronic?
Diesel Particulate	8.00E-02	7.80E-01	3.90E+01	2.34E+00	1.17E+02	N/A	3.4E-01	NO	YES	YES

Emissions from S-1 at Proposed Maximum Operating Rates

	g/bhp-hr	g/hr	lbs/hr	lbs/day	lbs/yr	tons/yr
POC	0.0100	44.23	0.0975	2.34	4.9	0.0024
NOx	4.1700	18443.91	40.6619	975.88	2033.1	1.0165
CO	0.1800	796.14	1.7552	42.12	87.8	0.0439
PM10	0.0100	44.23	0.0975	2.34	4.9	0.0024
SO2	0.0047	20.58	0.0454	1.09	2.3	0.0011

Outlet Concentration
s

ppmv @ 0% O ₂	ppmv @ 15% O ₂	grains / dscf
8.5	2.4	
1242.3	350.7	
88.1	24.9	
		0.0025
1.0	0.3	

Emissions from a Proposed New 16.53 Boilers (S-4, S-5, S-6, S-7)

Natural Gas Fuel

Operating: 24 hrs/day, maximum
365 days/yr, maximum
Maximum Firing Capacity: 16.53 MMBtu/hr, maximum, each
4 # of boilers

Criteria Pollutants	Emission Factor, ppmv @ 3% O2	Emission Factor, lb/MMBtu	Hourly Source Emissions, lbs/hr	Daily Source Emissions, lbs/day	Annual Source Emissions, lbs/yr	Annual Source Emissions, tpy	Annual Project Emissions, lbs/yr	Annual Project Emissions, tpy
PM10		7.45E-03	0.123	3.0	1079	0.54	4316	2.16
POC		5.39E-03	0.089	2.1	781	0.39	3123	1.56
NOx	15	1.82E-02	0.301	7.2	2635	1.32	10542	5.27
SO2		5.88E-04	0.010	0.2	85	0.04	341	0.17
CO	100	7.40E-02	1.223	29.4	10715	5.36	42862	21.43

conversion : 1020 Btu/scf
Maximum Firing Capacity: 0.01621 MMscf/hr

Toxic Air Contaminants	Emission Factor, lb/MMscf	Hourly Source Emissions, lbs/hr	Annual Source Emissions, lbs/yr	Hourly Source Sum Emissions, lbs/hr	Annual Source Sum Emissions, lbs/yr	Acute Trigger Level, lbs/hr	Chronic Trigger Level, lbs/yr	TAC Surcharge Required For Chronic?
Benzene	2.10E-03	3.40E-05	2.98E-01	1.36E-04	1.19E+00	2.9E+00	3.8E+00	NO
Formaldehyde	7.50E-02	1.22E-03	1.06E+01	4.86E-03	4.26E+01	1.2E-01	1.8E+01	NO
Toluene	3.40E-03	5.51E-05	4.83E-01	2.20E-04	1.93E+00	8.2E+01	1.2E+04	NO

Emissions from a Proposed New 3.75 Boilers (S-8, S-9, S-10)

Natural Gas Fuel

Operating: 24 hrs/day, maximum days/yr,
365 maximum

Maximum Firing Capacity: 3.75 MMBtu/hr, maximum, each
3 # of boilers

Criteria Pollutants	Emission Factor, ppmv @ 3% O2	Emission Factor, lb/MMBtu	Hourly Source Emissions, lbs/hr	Daily Source Emissions, lbs/day	Annual Source Emissions, lbs/yr	Annual Source Emissions, tpy	Project Emissions, lbs/yr	Project Emissions, tpy
PM10		7.45E-03	0.028	0.7	245	0.12	734	0.37
VOC		5.39E-03	0.020	0.5	177	0.09	531	0.27
NOx	30	3.60E-02	0.135	3.2	1183	0.59	3548	1.77
SO2		5.88E-04	0.002	0.1	19	0.01	58	0.03
CO	150	1.10E-01	0.413	9.9	3614	1.81	10841	5.42

conversion : 1020 Btu/scf

Maximum Firing Capacity: 0.00368 MMscf/hr

Toxic Air Contaminants	Emission Factor, lb/MMscf	Hourly Source Emissions, lbs/hr	Annual Source Emissions, lbs/yr	Hourly Source Sum Emissions, lbs/hr	Annual Source Sum Emissions, lbs/yr	Acute Trigger Level, lbs/hr	Chronic Trigger Level, lbs/yr	TAC Surcharge Required For Chronic?
Benzene	2.10E-03	7.72E-06	6.76E-02	2.32E-05	2.03E-01	2.9E+00	3.8E+00	NO
Formaldehyde	7.50E-02	2.76E-04	2.42E+00	8.27E-04	7.25E+00	1.2E-01	1.8E+01	NO
Toluene	3.40E-03	1.25E-05	1.10E-01	3.75E-05	3.29E-01	8.2E+01	1.2E+04	NO

Toxic Air Contaminants	Hourly Project Emissions, lbs/hr	Annual Project Emissions, lbs/yr	Acute Trigger Level, lbs/hr	Chronic Trigger Level, lbs/yr	HRA Required For Acute?	HRA Required For Chronic?
Benzene	1.59E-04	1.40E+00	2.9E+00	3.8E+00	NO	NO
Formaldehyde	5.69E-03	4.984E+01	1.2E-01	1.8E+01	NO	YES
Toluene	2.58E-04	2.26E+00	8.2E+01	1.2E+04	NO	NO

Emissions from Project

Criteria Pollutants	Project Emissions, lbs/yr	Project Emissions, tpy
PM10	5065	2.532
VOC	3661	1.831
NOx	14089	7.045
SO2	399	0.199
CO	53702	26.851