ENGINEERING EVALUATION

Facility ID No. 17340
Sutter Bay Medical Foundation DB Palo Alto
3140 Kearney Street, Fremont CA, 94538
Application No. 703264

Background

Sutter Bay Medical Foundation DB Palo Alto is applying for an Authority to Construct/Permit to Operate for the following equipment:

S-2 Emergency Standby Diesel Generator
Make: Caterpillar Model: GC C13, Model Year: 2023
609 bhp, 3.84 MMBtu/hr
Permit Condition Nos. 100072 and 100073

The criteria pollutant emissions from S-2 are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

S-2 meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 3 Off-road standard. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

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

Emissions

Table 1. Annual and Daily Emissions from EPA/CARB Certified Data from S-2

Pollutant	Emission Factor (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NOx	2.69	86.6	180.4	0.090
POC	0.15	4.8	10.1	0.005
CO	2.01	64.7	134.8	0.068
$PM_{10}/PM_{2.5}$[1]	0.12	3.9	8.0	0.004
SO_2	N/A[2]	0.19	0.4	0.0002

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-2
- Max daily emissions: 24-hour operation
- Emissions from EPA Engine Family PCPXL12.5 NYS (variable speed), which matched the emissions provided by the applicant.
- [1] Conservative Assumption: All PM emissions are PM2.5
- [2] SO_2 emission factor from AP-42 Table 3.4-1, SO_2 (15 ppm) = 0.00809*0.0015 lb SO_2/bhp-hr

Plant Cumulative Increase

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application. These emissions are based on 50 hours of discretionary use. S-1, the only other permitted source at the site, is a Loss-of-Exemption engine and therefore does not contribute to the plant's cumulative emissions.

Table 2. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NOx	0.097	0.090	0.187
POC	0.005	0.005	0.010
CO	0.020	0.068	0.088
PM_{10}	0.003	0.004	0.007
$PM_{2.5}$	0.000	0.004	0.003
SO_2	0.020	0.0002	0.0202

Compliance Determination

Regulation 1, "General Provision and Definitions

The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The emergency diesel engine is a certified engine and will be used for limited hours, for testing and maintenance, other than during an actual emergency. The engine is not expected to be a source of public nuisance, as the allowed hours of operation and emissions are low.

Regulation 2, Rule 1, "Permits – General Requirements"

California Environmental Quality Act (CEQA)

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 CEQA requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312.

This project does not qualify for a ministerial categorical exemption because a BACT analysis was triggered. However, the installation of this standby emergency engine qualifies for a categorical exemption pursuant to Section 15301 of the 2023 CEQA Statute and Guidelines, wherein an existing facility that provides utility services is exempt from a CEQA review if the project involves negligible expansion of use. Although the addition of this emergency generator would increase the facility's emissions, the amount that it is increasing and the proximity to receptors does not significantly alter the facility's impact on its surrounding area.

Public Notification

The public notification requirements of Regulation 2-1-412 apply to modifications which result in an increase in toxic air contaminant or hazardous air contaminant emission at facilities within 1,000 feet of the boundary of a K-12 school. The Applicant has reported that there are schools located within 1,000 feet of this facility. The District's database indicates that there is one K-12 school located within this distance of the facility. Therefore, a public notification is required and notice will be given to the students at each of the three schools and nearby residents.

Regulation 2, Rule 2, "Permits – New Source Review"

Best Available Control Technology (BACT)

Any new source is required to use Best Available Control Technology (BACT) to control emissions of any BAAQMD BACT pollutants [precursor organic compounds (POC), non- precursor organic compounds (NPOC), oxides of nitrogen (NOx), sulfur dioxide (SO2), PM10, PM2.5, and/or carbon monoxide (CO)] that have the potential to emit 10.0 or more pounds each on any day.

> Based on the emission calculations presented in Table 1C, BACT is triggered for NOx and CO since the maximum daily emissions per new source is greater than 10.0 lb/day for these pollutants.

BACT is defined as the most stringent emissions limitation, control device, or control technique that (i) has been achieved in practice at other similar sources and/or (ii) is technologically feasible and cost-effective. See Reg. 2-2-202. To determine what level of control constitutes BACT for the emergency backup diesel engines, the BAAQMD reviewed available control technologies that can be effective at controlling NOx and CO from these sources.

Control Technology Review

Several control technologies can reduce NOx and CO 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 NOx formed during combustion. The less nitrogen available in the fuel, the less can be converted to NOx upon combustion. Diesel fuel producers are not required to remove nitrogen from the fuel specifically for NOx 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 fuel will provide benefits in reducing NOx emissions as well as reducing sulfur dioxide emissions. Ultra-low sulfur diesel is required to be used by the California Air Resources Board (CARB) and is therefore achieved in practice for these engines.

Combustion Technologies

NOx and CO 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 3.[2] The use of Tier 3 engines is achieved in practice.

Post-Combustion Technologies

Currently, the most effective and prevalent post combustion technologies used to abate NOx and CO 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, 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. With emergency standby generators, the catalyst would not reach its effective temperature during short-duration operations associated with periodic testing and maintenance, which is primarily how these engines will be operated.

BACT Analysis

The first step in the BACT analysis is to determine what level of emissions control has been achieved in practice for the sources at issue. When considering post-combustion technologies that have been achieved in practice for smaller emergency backup engines like S-2, the BAAQMD consulted BACT clearinghouses and guidelines published by US EPA, CARB, and other Air Districts. We are unaware of any engines in this size range that are operating under any more stringent standards than Tier 3 that would qualify as achieved in practice BACT under our BAAQMD program. Because S-2 is certified to achieve Tier 3 standards without post-combustion control, post-combustion catalytic control technologies are not considered BACT for S-2.

The second step in the BACT analysis is to determine whether there is any more stringent level of control, beyond what has been achieved in practice, that is technologically feasible and cost- effective for the source under review. The BAAQMD therefore considered whether catalytic control devices would be technologically feasible and cost-effective for S-2.

Catalytic control devices only become effective when the engines are operated for longer periods in the case of a power outage. Emergency operation will be infrequent, however, and it is not expected to last for a significant amount of time when it does occur. As a result, the emission reduction benefit from having a catalytic control device would be less than optimal and would not be cost-effective under the BAAQMD's BACT regulations given the costs involved. Studies that have evaluated the additional costs and emission reduction benefits that would be involved in implementing catalytic control technologies on emergency backup engines have shown that the cost would be in the range of $68,000 to $682,000 per ton of emission reduction benefit.[3] This cost per ton greatly exceeds the BAAQMD's BACT cost-effectiveness threshold of $17,500 per ton. Catalytic control devices are therefore not considered technologically feasible and cost-effective for this source.

[2] EPA's diesel emission tiers range from Tier 0 through Tier 4. The Tier 4 standards require catalytic control devices, which are addressed below. There are Tier 3 standards for diesel engines between 300 and 600 horsepower. The next most stringent set of standards for this size category after Tier 3 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 3 for this size category.

From the analysis of the various technologies that could be implemented to reduce NOx, the BAAQMD has concluded that as of the application completion date on August 13th, 2024, the use of ultra-low sulfur diesel fuel and an EPA Tier 3 certified engine are achieved-in-practice control technologies. These control technologies are therefore required as BACT for S-2. S-2 is certified to meet the EPA Tier 3 emissions standard, and the applicant will be required by CARB regulations to use ultra-low-sulfur diesel fuel. 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 S-2 engine family, the NOx and CO emission rates are below the applicable BACT emission limits.

Table 3. S-2 Best Available Control Technology

Pollutant	BACT Limit Tier 3 for Engines ≥600 and <750	S-2 Certified (Unabated) Emissions, g/bhp-hr
NOx	3.0	2.69
CO	2.6	2.01

* The standard is expressed as 3.0 g/bhp of NMHC+NOx. NOx is estimated to be 95% of the combined standard (3.0*0.95 = 2.85 g/bhp-hr)

Offsets

Per Regulation 2, Rule 2, Section 302, emission offsets must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NOx or POC. Per Regulation 2, Rule 2, Section 303, emission offsets must be provided for any new or modified source at a facility that will have the potential to emit more than 100 tons per year or more of PM2.5, PM10 or sulfur dioxide.

Table 4. Potential to Emit for FID 203118

Pollutant	Existing Emissions (TPY)	Application Emissions* (TPY)	Facility Emissions (TPY) *	Offset Requirement (TPY)	Offsets Required
NOx	0.2912	0.2706	0.5618	>10	N
POC	0.0154	0.0151	0.0305	>10	N
CO	0.0579	0.2022	0.2601	-	N
PM_{10}	0.0081	0.0121	0.0201	≥100	N
$PM_{2.5}$	0.0081	0.0121	0.0201	≥100	N
SO_2	0.0005	0.0006	0.0011	≥100	N

**Existing emissions are from S-1 allowed 20 hours of discretionary operation and assumed emergency operation of 100 hours.*

**Application emissions: Reliability-related activity of 50 hours and assumed emergency operation of 100 hours for S-2.*

Since the facility's potential to emit is below the offsets trigger levels specified in Regulation 2-2, emission offsets are not required.

Regulation 2, Rule 5, "Permits – New Source Review of Toxic Air Contaminants"

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants (TAC). All TAC emissions from new and modified sources as defined in Section 2-5-214 are subject to risk assessment, if the emissions of any individual TAC exceed either the acute or chronic emission thresholds defined in Table 2-5-1.

Health Risk Assessment (HRA)

The diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year. All PM_{10} emissions are considered diesel particulate emissions. The PM_{10} emissions from this application are summarized in Table 1. Since the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year, an HRA was performed. There were no other related projects permitted in the last five years to be included in the HRA for this project.

The HRA found that the project's cancer risk is estimated at 1.0 in a million, and the chronic hazard index (HI) is estimated at 0.00080. Since the estimated source risk does not exceed a cancer risk of 1.0 in a million and/or a chronic HI of 0.20, TBACT is not required for this project.

Since the estimated project cancer risk does not exceed 10 in a million, and project chronic HI does not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements, for projects not located in an Overburdened Community as defined in Regulation 2-1-243.

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

40 CFR Part 70, State Operating Permit Programs (Title V)

The federal operating permit program requirements in 40 CFR Part 60 have been codified in District Regulation 2, Rule 6. This facility does not have the potential to emit 100 tons per year or more of any criteria pollutant, 10 tons per year or more of any individual hazardous air pollutant, nor a total of 25 tons per year or more of multiple hazardous air pollutants. Therefore, this facility is not required to obtain a federal Title V operating permit.

Regulation 3, "Fees"

Regulation 3 specifies the application and Permit to Operate fees. The Applicant has paid the applicable fees, which were billed under Invoice T168775, which included a public notice fee of $2,272.

Regulation 6, Rule 1, "Particulate Matter – General Requirements"

The proposed diesel engine S-1 is subject to the Section 6-1-310.1 limit on total suspended particulate emissions of 0.15 grains per dry standard cubic foot of exhaust gas volume. If it is assumed that the diesel engine exhaust gases contain 15% excess oxygen under normal operating conditions, this limit can be compared to the PM emission factors for this engine, as follows.

From 40 CFR Part 60, Appendix A, Method 19, Table 19-1, a stoichiometric dry gas combustion factor of 9,190 dscf/MMBtu is given for distillate oil combustion. At 15% excess oxygen, this factor becomes:

*(9,190 dscf/MMBtu) * (21%/(21%-15%)) = 32,165 dscf combustion products/MMBtu.*

The conversion of the Section 6-1-310 standard of 0.15 gr/dscf at 15% oxygen to lb/MMBtu is:

*(32,165 dscf/MMBtu) * (0.15 gr/dscf) * (lb/7000 gr) = 0.689 lb/MMBtu*

Based on the fuel consumption rate for S-2, 3.41 MMBtu/hour, the certified PM emission rate from this engine in terms of fuel consumption is 0.042 lbs/MMBtu. Since this PM emission rate is well below the converted Section 6-1-310 emission rate of 0.689 lb/MMBtu, this engine complies with Section 6-1-310.

Compliance with the Ringelmann No. 2 visible emission standard in Section 6-1-303, and the public nuisance prohibition in Section 6-1-305 is expected based on compliance with the Section 6-1-310.1 emission standard and the certification of the proposed engine.

Section 6-1-401 requires the operator to have the means to know the appearance of emissions from the operations at all times. Except during emergency operation, the engine will only be operated for maintenance and testing, and the operator is expected to monitor emissions during these manned hours of operation.

Regulation 8, Rule 1, "Organic Compounds"

Internal combustion engines are exempted from the provisions of Regulation 8 per Section 8-1-110.2, so the organic emissions from the engine are not subject to any emission limit in Regulation 8.

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

Regulation 9, Rule 1 limits emissions of SO2 and applies to the emergency diesel engines. Section 9-1-304 limits the sulfur content of liquid fuel to 0.5% by weight. This standard will be met since California diesel fuel is limited to 0.0015% by weight. This low sulfur content is also expected to ensure compliance with the ground level concentration limit in Section 9-1-301.

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

Regulation 9, Rule 8 applies to stationary internal combustion engines with a rated output greater than 50 bhp. Section 9-8-110.5 exempts emergency standby engines from Sections 301 through 305, 501, and 503 of this rule. Since S-2 will be operated as an emergency standby engine, the limitation to 50 hours of reliability-related operation in any calendar year in Section 9-8-330 applies. Compliance with this limit is expected. Operation during emergencies is not limited. In addition, the monitoring and recordkeeping requirements in Section 9-8-530 apply and are included in the standard permit conditions for the source.

CA Code of Regulations, Title 17, Section 93115, Airborne Toxic Control Measure for Diesel Particulate Matter from Stationary Engines Rated at 50 Horsepower and Greater

The emergency diesel engine S-2 is subject to the California Air Resources Board Air Toxic Control Measure (ATCM) for stationary diesel engines since it is a diesel-fueled engine with a rating greater than 50 brake horsepower.

Section 93115.5 requires use of CARB diesel fuel or one of the other approved alternative diesel fuels. The Applicant is expected to comply with this requirement.

Section 93115.6(a)(3)(A) of the current regulation specifies PM, NMHC+NOx, and CO emission limits based on the power rating of the engine for 2007 and newer engines, summarized in Table 6. S-2 meets the emission standards as shown in the tables below.

This section also requires the engines to be certified to meet the new nonroad compression-ignition standards in 40 CFR Part 60, Subpart IIII, and limits use to not more than 50 hours per year for maintenance and testing. This engine is certified, and the permit conditions for S-2 will limit discretionary operation to 50 hours per year.

Table 5. CARB ATCM Limits for New Stationary Emergency Engines (2007+ model year)

	PM, g/bhp-hr	NMHC+NOx, g/bhp-hr	CO, g/bhp-hr
Standard for Engine ≥ 600 hp, < 750 hp	0.15	3.0	2.6
S-2 Certified Unabated Emissions	0.12	2.84	2.01

Section 93115.10(d)(1) and (f) require installation and maintenance of a non-resettable hour-meter and records of hours of operation, the reason for the operation, and fuel used. These requirements will be included in the permit conditions for the engine.

40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII contains standards for stationary compression ignition internal combustion engines. This regulation applies to manufacturers, owners, and operators of stationary internal combustion engines, meeting certain size and model year requirements. Section 60.4200(a)(2)(i) specifies that owners/operators of engines constructed after 7-11-2005 which were manufactured after 4-1-2006 and are not fire pump engines are subject to this regulation. S-2 is a 2023 model year stationary compression-ignition engine and is subject to this regulation.

Section 60.4205 applies to 2007 model year and later stationary compression-ignition engines with displacement of less than 30 liters per cylinder, which are not fire pump engines, and specifies emission standards for emergency engines. S-2 has a displacement of 12.503 liters and is subject to this section. Section 60.4205(b) requires engines to comply with the emission standards for new nonroad compression-ignition engines in Section 60.4202 for the same model year and maximum power rating. Section 60.4202(a)(2) requires model year 2007 and later emergency engines with maximum power of 50 hp or greater to meet the emission standards for new nonroad compression-ignition engines in 40 CFR 89.112 and 113 for all pollutants. These are the same

standards as contained in the current state ATCM, summarized in Table 6 above, and S-2 is certified to meet these emission standards.

Section 60.4207 requires use of diesel fuel that meets the requirements of 40 CFR Part 80.510(b). California diesel fuel meets the requirements of this regulation. Section 60.4211(f) limits operation in non-emergency situations to 50 hours per year and allows unlimited use for emergency operation. Operation in excess of 50 hours per year for the purposes otherwise specified in Section 60.4211(f) is not allowed by District Regulation 9, Rule 8. The Applicant is expected to comply with these fuel and operational restrictions.

40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs)

There are no subparts under 40 CFR Part 61 that apply to internal combustion engines.

40 CFR Part 63, Emission Standards for Hazardous Air Pollutants for Source Categories

Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ contains the standards for stationary reciprocating internal combustion engines located at major and area sources of HAP emissions. Since S-2 is a stationary engine, this regulation applies. Section 63.6590(c)(1) specifies that a new stationary reciprocating, compression-ignition internal combustion engine located at an area source must meet the requirements of this regulation by meeting the requirements of 40 CFR Part 60, Subpart IIII. No other requirements under this regulation apply. S-2 meets the requirements of 40 CFR Part 60, Subpart IIII, as discussed above.

Statement of Compliance

The owner/operator is expected to comply with all the applicable requirements that were discussed above.

Permit Conditions

Permit Condition #100072 for 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. I For each emergency, the nature of the emergency condition. 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-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]

End of Conditions

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. 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-2 Emergency Standby Diesel Generator
Make: Caterpillar Model: GC C13, Model Year: 2023
609 bhp, 3.84 MMBtu/hr
Permit Condition Nos. 100072 and 100073

Prepared By:

Lucas Griswold
Air Quality Engineer

May 19, 2025
Date

Attachment 1

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

Source Category

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

Determination

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC (NMHC)	1. n/s[c] 2. CARB ATCM standard[a] for POC at applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
NOx	1. n/s[c] 2. CARB ATCM standard[a] for NOx at applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
SO_2	1. n/s[c] 2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm (wt).	1. n/s[c] 2. CARB Diesel Fuel (Ultra Low Sulfur Diesel)
CO	1. n/s[c] 2. CARB ATCM standard[a] for CO at the applicable horsepower rating (see attached Table 1).	1. n/s[c] 2. Any engine certified or verified to achieve the applicable standard. [a]
PM_{10}	1. n/s[c] 2. 0.15 g/bhp-hr 3. 0.15 g/bhp-hr	1. n/s[c] 2. Any engine or technology demonstrated, certified or verified to achieve the applicable standard. 3. Any engine or technology demonstrated, certified or verified to achieve the applicable standard.
NPOC	1. n/s 2. n/s	1. n/s 2. n/s

* Applies to open permit applications with a complete date on or after 1/1/2020.

References

a. 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.

b. Deleted (no longer applies).

c. Cost- effectiveness analysis must be based on lesser of 50 hr/yr or non-emergency operation as limited by District health risk screen analysis.

Table 1: BACT 2 Emission Limits based on CARB ATCM

Emissions Standards for Stationary Emergency Standby Diesel-Fueled CI Engines ≥50 BHP g/Kw-hr (g/bhp-hr)			
Maximum Engine Power	**PM**	**NMHC+NOx**	**CO**
37 ≤ KW < 56 (50 ≤ HP < 75)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
56 ≤ KW < 75 (75 ≤ HP < 100)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
75 ≤ KW < 130 (100 ≤ HP < 175)	0.20 (0.15)	4.0 (3.0)	5.0 (3.7)
130 ≤ KW < 225 (175 ≤ HP < 300)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
225 ≤ KW < 450 (300 ≤ HP < 600)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
450 ≤ KW ≤ 560 (600 ≤ 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)