

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 1
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

ENGINEERING EVALUATION

COMPANY NAME AND ADDRESS

Loma Linda University Medical Center
101 E Redlands Blvd.
San Bernardino, CA 92408

CONTACT(S): Henry Cairus, Environmental Health Supervisor, (909) 651-4019

EQUIPMENT LOCATION

AQMD ID 800234
11206 Campus St.
Loma Linda, CA 92354

EQUIPMENT DESCRIPTION

A/N 546755
Title V Significant Permit Revision

A/N 545807
(Located at the Campus Street Parking Structure)

INTERNAL COMBUSTION ENGINE, CATERPILLAR, MODEL NO. C-9, DIESEL-FUELED, 6 CYLINDERS, TURBOCHARGED, AFTERCOOLED, RATED AT 480 BHP, DRIVING AN EMERGENCY ELECTRICAL GENERATOR, WITH A DIESEL PARTICULATE FILTER, RYPOS, MODEL HDPF, ACTIVE REGENERATION, WITH A BACK PRESSURE MONITOR AND ALARM SYSTEM.

BACKGROUND

Loma Linda University Medical Center (LLUMC) submitted an application for Permit to Construct/Operate an emergency engine to be located at a new parking structure. An application to amend their Title V permit was also submitted. LLUMC has a Title V permit alternative format.

The equipment is a new tier 3 engine with a Level 3 CARB certified diesel particulate filter (DPF). The DPF is an active type, which does not rely on diesel exhaust temperature for regeneration rather an electrical current is to heat the filter media to burn off any accumulated soot.

The project is subject to EPA 45 review and a 30 day public notice for a significant revision prior to issuance of the new TV permit.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 2
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

COMPLIANCE REVIEW

A review of the District Compliance database reveals that an inspection was conducted on 7/17/12. A Notice of Violation was issued (P60020) for failing to submit a Form 500-SAM by their due date. As a Major Source and Title V facility, it is subject to annual inspections by District Enforcement staff.

CALCULATIONS

Table 1 Data

Parameter	Value	Unit	Source
Schedule	1	hrs/day	Default
	1	day/wk	Default
	4	hrs/mo	Facility
	50	hrs/yr	BACT
Rating	480	bhp	Manufacturer
NO _x EF	2.75	g/bhp-hr	CEP A/N 455163
SO _x EF	0.0049	g/bhp-hr	Mass Balance ^(a)
PM ₁₀ EF	0.01	g/bhp-hr	Calculated ^(b)
CO EF	2.45	g/bhp-hr	CEP A/N 442149
VOC EF	0.16	g/bhp-hr	CEP A/N 442149

^(a) Mass balance based on diesel fuel with sulfur content of 15 ppmw.

^(b) Calculated as 0.118 g/bhp-hr x (1-0.85)

Table 2 Engine Mass Emission Rates

Pollutant	lb/hr ^(a)	lb/day ^(b)	30-DA ^(c)	lb/yr ^(d)
NO _x	2.91	2.91	0.41	146
SO _x	0.01	0.01	0	0
PM ₁₀	0.01	0.01	0	1
CO	2.59	2.59	0.36	130
VOC	0.17	0.17	0.02	8

^(a) Rating x EF ÷ 453.6 g/bhp-hr;

^(b) Rate (lb/hr) x Schedule (hrs/day)

^(c) Rate (lb/hr) x Schedule (hrs/mo) ÷ 30

^(d) Rate (lb/hr) x Schedule (hrs/yr)

Table 3 BACT Compliance Limits

Pollutant	(g/bhp-hr)		
	Proposed	BACT (Tier 3)	Complies?
NO _x + HC	2.91	3.0	Yes
SO _x	Sulfur < 15 ppmw	Sulfur < 15 ppmw	Yes
PM ₁₀	0.01	Compliance with R1470	Yes
CO	2.45	2.6	Yes

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 3
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

RULES EVALUATION

RULE 212-STANDARDS FOR APPROVING PERMITS AND ISSUING PUBLIC NOTICES

Rule 212 requires that a person shall not build, erect, install, alter, or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants without first obtaining written authorization for such construction from the Executive Officer. Rule 212(c) states that a project requires written notification if there is an emission increase for ANY criteria pollutant in excess of the daily maximums specified in Rule 212(g), if the equipment is located within 1,000 feet of the outer boundary of a school, or if the MICR is equal to or greater than one in a million (1×10^6) during a lifetime (70 years) for facilities with more than one permitted unit, source under Regulation XX, or equipment under Regulation XXX, unless the applicant demonstrates to the satisfaction of the Executive Officer that the total facility-wide maximum individual cancer risk is below ten in a million (10×10^6) using the risk assessment procedures and toxic air contaminants specified under Rule 1402; or, ten in a million (10×10^6) during a lifetime (70 years) for facilities with a single permitted unit, source under Regulation XX, or equipment under Regulation XXX. The installation of the new engine does not trigger the public notice requirements of sections (c)(1), (c)(2), and (c)(3).

RULE 401 - VISIBLE EMISSIONS

This rule limits visible emissions to an opacity of less than 20 percent (Ringelmann No.1), as published by the United States Bureau of Mines. Compliance is expected with well maintained and properly operated equipment.

RULE 402 - NUISANCE

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The engine is not expected to create a public nuisance based on experience with identical diesel engines. Therefore, compliance with Rule 402 is expected.

RULE 431.2-SULFUR CONTENT OF LIQUID FUELS

The engine will use diesel fuel that will comply with the requirements of this rule. Compliance is expected.

RULE 1110.2 – EMISSIONS FROM GASEOUS- AND LIQUID FUELED ENGINES

The engines will operate on an emergency basis for less than 200 hours per year, which will be verified with an elapsed time meter; therefore, the equipment is exempt from the requirements of this rule per paragraph (h)(2).

NEW SOURCE REVIEW (NSR)

The following section describes the NSR analysis for this project and it will be evaluated for compliance with the rules below.

RULE 1303(a) – BACT

The engine is rated is rated greater than or equal to 300 bhp and less than 600 bhp; therefore, it must meet tier 3 requirements. The equipment proposed is tier 3.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 4
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

RULE 1303(b)(1) - MODELING

The engine is for emergency use only and will not operate beyond 200 hours per year; therefore, modeling is not required.

RULE 1303(b)(2) - OFFSETS

The engine is for emergency use only and will not operate beyond 200 hours per year; therefore, offsets are not required per Rule 1304.

RULE 1401 – NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

The engine will operate on an emergency basis and is therefore exempt from the requirements of this rule per paragraph (g)(1)(F).

RULE 1470 – REQUIREMENTS FOR STATIONARY DIESEL-FUELED INTERNAL COMBUSTION AND OTHER COMPRESSION IGNITION ENGINES

The engine is subject to the requirements of this rule.

(c)(2)(C)(i)

Annual operation is to less than 50 hours per year for testing and maintenance. The engine will be limited to 50 hours per year.

(c)(2)(C)(iii)

Engines are required to have a diesel PM rate less than 0.15 g/bhp-hr. The engine has a PM rate less than 0.15 g/bhp-hr; therefore, the equipment complies with this section of the rule.

(c)(2)(C)(iv)(I)

An engine located within 50 m from a “sensitive receptor” must meet more stringent PM limits. Since the engine is located within 50 m from a hospital, it must meet the requirements of engines rated between 175 and 750 bhp, which is 0.01 g/bhp-hr. The engine is equipped with a DPF that allows it to meet this limit.

(c)(2)(C)(vii)

For engines rated between 175 bhp and 750 bhp, the limits are 3.0 g/bhp-hr for NO_x+NMHC and 2.6 g/bhp-hr for CO. The engine complies with these limits.

(c)(2)(F)

The filter media must be cleaned in accordance with the rule for engines installed with DPFs. The permit will include conditions for filter cleaning.

(d)(5)(a)

The engine will be equipped with a time meter.

(d)(5)(b)

The engine will be installed with a backpressure monitor.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 5
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

RULE 1472 – REQUIREMENTS FOR FACILITIES WITH MULTIPLE STATIONARY EMERGENCY STANDBY DIESEL-FUELED INTERNAL COMBUSTION ENGINES

This facility has more than three emergency engines at this location; however, LLUMC filed an initial notification of exemption and were granted an exemption under (d)(1). In addition, the new engine will have DPFs that will result in PM emission limit of 0.01 g/bhp-hr.

REGULATION XXX – TITLE V

LLUMC is a Title V facility with a Title V permit.

RULE 3000 – GENERAL

(b)(31)(I) requires that the installation of new equipment subject to an NSPS or NESHAPS to be handled as a significant revision.

RULE 3003 – APPLICATIONS

The “significant permit revision” is expected to comply with all applicable requirements of this rule.

(i)(4) The significant permit revision will be issued only after the permit revision application has been found to comply with all conditions of this rule.

(j)(1) The permit revision will be forwarded to EPA for a 45 day review period.

RULE 3005 – PERMIT REVISION

(f) The proposed Title V permit revision satisfies all the applicable conditions listed in this rule. The modification constitutes a “significant permit revision”.

RULE 3006 – PUBLIC PARTICIPATION

(a) The proposed “significant permit revision” requires that the AQMD process includes public participation, as such a public notice with a 30-day comment period will be conducted.

40 CFR 60 SUBPART IIII – STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

§60.4205(b)

Emergency engines model years 2007 and later with a displacement of less than 30 liters per cylinder must comply with the EPA non-road emissions standards. The engine complies with the EPA tier 3 standards. A condition will be placed on the permit to comply with the requirements of 40 CFR 89.112.

§60.4207(b)

The facility will be required to purchase diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel; 15 ppm sulfur content, minimum cetane index of 40; or maximum aromatic content of 35 volume percent. A condition will be placed on the permit to comply with these requirements.

§60.4209(a)

The emergency engine does not meet the standards applicable to non-emergency engines; therefore, the engine must be equipped with non-resettable hour meter. A condition will be placed on the permit to ensure the engine meets this requirement.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 6
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

§60.4209(b)

Engines that install DPFs to comply with the emissions limits of §60.4204 must install backpressure monitors. The engine is not required to meet the emission limits; therefore, this section is not applicable.

§60.4211(c)

The engine must be installed and configured according to the manufacturer's emission related specifications.

§60.4211(f)

Maintenance checks for readiness testing are limited to 100 hours per year, with no limit for emergency operation. AQMD Rule 1470 & 1303(a) only allow up to 50 hours per year for testing and maintenance and 200 hours for any type of operation.

§60.4214(b)

The facility is not subject to notification, but it is subject to the recordkeeping requirements of operation for emergency and non-emergency service. The facility is required to record the time and reason for operation.

§60.4214(c)

Engines equipped with DPFs are required to keep records of any corrective actions after the backpressure monitor has notified the operator that high backpressure is approached.

40 CFR 63 SUBPART ZZZZ – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

40 CFR 63.6590 (c)(1)

The engine is new and located at an Area Source which meets the requirements of 40 CFR Subpart IIII. Therefore, no further requirements apply to the engines under this part.

RECOMMENDATION(S)

Following the 45 day EPA review period and 30 day public comment period. Issue TV Permit that includes the new equipment with the permit conditions shown below:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS ENGINE SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF RULE 431.2 AND RULE 1470.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 7
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

[RULE 431.2, RULE 1470]

4. THIS ENGINE SHALL NOT OPERATE MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING AND NO MORE THAN 4.2 HOURS IN ANY ONE MONTH FOR MAINTENANCE AND TESTING.
[RULE 1110.2, RULE 1303(a), 40 CFR 60.4211(f)]

5. THE OPERATION OF ENGINE BEYOND THE 50 HOURS PER YEAR ALLOTTED FOR ENGINE MAINTENANCE AND TESTING SHALL BE ALLOWED ONLY IN THE EVENT OF A LOSS OF GRID POWER OR UP TO 30 MINUTES PRIOR TO A ROTATING OUTAGE, PROVIDED THAT THE ELECTRICAL GRID OPERATOR OR ELECTRIC UTILITY HAS ORDERED ROTATING OUTAGES IN THE CONTROL AREA WHERE THE ENGINE IS LOCATED OR HAS INDICATED THAT IT EXPECTS TO ISSUE SUCH AN ORDER AT A CERTAIN TIME, AND THE ENGINE IS LOCATED IN A UTILITY SERVICE BLOCK THAT IS SUBJECT TO THE ROTATING OUTAGE. ENGINE OPERATION SHALL BE TERMINATED IMMEDIATELY AFTER THE UTILITY DISTRIBUTION COMPANY ADVISES THAT A ROTATING OUTAGE IS NO LONGER IMMINENT OR IN EFFECT.
[RULE 1470]

6. AN OPERATIONAL NON-RESETTABLE ELAPSED TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
[RULE 1110.2, RULE 1303(b)(2), RULE 1470, 40 CFR 60.4209(a)]

7. THIS ENGINE SHALL NOT BE PART OF A DEMAND RESPONSE PROGRAM USING INTERRUPTIBLE SERVICE CONTRACT IN WHICH A FACILITY RECEIVES A PAYMENT OR REDUCED RATES IN RETURN FOR REDUCING ITS ELECTRIC LOAD ON THE GRID WHEN REQUESTED TO DO SO BY THE UTILITY OR GRID OPERATOR.
[RULE 1470]

8. THIS ENGINE SHALL NOT BE OPERATED UNLESS ITS EXHAUST IS VENTED TO THE DIESEL PARTICULATE FILTER WHICH SHALL BE IN FULL OPERATION AND IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 1303(a)]

9. THE OPERATOR SHALL OPERATE THE DIESEL PARTICULATE FILTER SYSTEM WITH AN OPERATIONAL BACKPRESSURE MONITOR.
[RULE 1303(a), RULE 1470]

10. THE BACKPRESSURE MONITOR AND ALARM SYSTEM SHALL WARN THE OPERATOR OF APPROACHING HIGH BACKPRESSURE THROUGH VISUAL WARNING LIGHTS, SOUNDING AN AUDIBLE ALARM, OR BY SENDING A REMOTE ALARM SIGNAL TO THE OPERATOR. THE BACKPRESSURE SHALL NOT EXCEED 23.7 INCHES OF WATER COLUMN.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 8
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

[RULE 1303(a)]

11. REMOVAL OF THE DIESEL PARTICULATE FILTER'S MEDIA FOR CLEANING MAY ONLY OCCUR UNDER THE FOLLOWING CONDITIONS:
 - A. THE INTERNAL COMBUSTION ENGINE SHALL NOT BE OPERATED FOR MAINTENANCE AND TESTING OR ANY OTHER NON-EMERGENCY USE WHILE THE DIESEL PARTICULATE FILTER MEDIA IS REMOVED; AND
 - B. THE DIESEL PARTICULATE FILTER'S MEDIA SHALL BE RETURNED AND RE-INSTALLED WITHIN 10 WORKING DAYS FROM THE DATE OF REMOVAL; AND
 - C. THE OWNER OR OPERATOR SHALL MAINTAIN RECORDS INDICATING THE DATE(S) THE DIESEL PARTICULATE FILTER'S MEDIA WAS REMOVED FOR CLEANING AND THE DATE(S) THE FILTER MEDIA WAS RE-INSTALLED. RECORDS SHALL BE RETAINED FOR A MINIMUM PERIOD OF 36 MONTHS.

[RULE 1470]

12. AN ENGINE OPERATING LOG SHALL BE KEPT AND SHALL DOCUMENT THE TOTAL TIME THE ENGINE IS OPERATED EACH MONTH AND SPECIFIC REASON FOR OPERATION AS:
 - A. EMERGENCY USE.
 - B. MAINTENANCE AND TESTING.
 - C. OTHER (DESCRIBE THE REASON FOR OPERATING).

IN ADDITION, EACH TIME THE ENGINE IS MANUALLY STARTED, THE LOG SHALL INCLUDE THE DATE OF OPERATION, THE SPECIFIC REASON FOR OPERATION, AND THE TIME METER READING (IN HOURS AND TENTHS OF HOURS) AT THE BEGINNING AND END OF OPERATION.

[RULE 1303(b)(2), RULE 1470, 40 CFR 60.4214(b)]

13. ON OR BEFORE JANUARY 15 TH OF EACH YEAR, THE OPERATOR SHALL RECORD IN THE ENGINE OPERATING LOG THE FOLLOWING:
 - A. THE TOTAL HOURS OF OPERATION FOR THE PREVIOUS CALENDAR YEAR, AND
 - B. THE TOTAL HOURS OF ENGINE OPERATION FOR MAINTENANCE AND TESTING FOR THE PREVIOUS CALENDAR YEAR.

ENGINE OPERATING LOG SHALL BE RETAINED ON SITE FOR A MINIMUM OF FIVE CALENDAR YEARS AND SHALL BE MADE AVAILABLE TO THE EXECUTIVE OFFICER OR REPRESENTATIVE UPON REQUEST.

[RULE 1303(b)(2)]

14. THE OPERATOR SHALL COMPLY WITH THE EMISSION STANDARDS SPECIFIED IN 40 CFR 60.4205(b) BY PURCHASING AN ENGINE CERTIFIED TO THE EMISSION STANDARDS IN 40 CFR 60.4205(b), AS APPLICABLE, FOR THE SAME MODEL YEAR AND MAXIMUM ENGINE POWER. THE ENGINE MUST BE INSTALLED AND CONFIGURED ACCORDING TO THE MANUFACTURER'S EMISSION RELATED SPECIFICATIONS.

[40 CFR 60.4211(c)]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 9	PAGE NO. 9
	APPL. NO. See Equipment Description	DATE 5/30/2013
	PROCESSED BY M SAULIS	CHECKED BY

Emissions and Requirements:

15. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS
PM: 0.01 G/BHP-HR, RULE 1470
NO_x+NMHC: 3.0 G/BHP-HR, RULE 1303(a), 40 CFR60.4205(b)
CO: 2.6 G/BHP-HR, RULE 1303(a), 40 CFR60.4205(b)
PM: 0.15 G/BHP-HR, RULE 1303(a), 40 CFR60.4205(b)