



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

August 17, 2010

Mr. Gerardo Rios
Chief – Permits Office
U. S. EPA, Region IX
75 Hawthorne Street, Air 3
San Francisco, CA 94105

Dear Mr. Rios:

Subject: California Institute of Technology (ID 800387) – Title V Permit
Revision

California Institute of Technology (ID 800387) has proposed to revise their Title V permit by adding an emergency internal combustion engine. This is a university (SIC 8221) located at 650 S. Wilson Ave., Pasadena, CA 91106. This proposed permit revision is considered as a “de minimis significant permit revision” to their Title V permit. Attached for your review is the evaluation and permit for the proposed revision. With your expected receipt of the proposed Title V permit revision today, we will note that the EPA 45-day review period begins on August 17, 2010.

If you have any questions or need additional information regarding the proposed permit revision, please call Vicky Lee of my staff at (909) 396-2284.

Very truly yours,

A handwritten signature in black ink, appearing to read 'B. Yeh', is written over a large, faint, circular watermark or stamp.

For
BRIAN YEH

Brian L. Yeh
Senior Manager
General Commercial and Energy Team
Engineering and Compliance

BLY:AYL:RGC:VL
Attachments

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	1
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

CAL INST OF TECH
1200 E. CALIFORNIA BLVD.
PASADENA, CA 91125

Facility ID No. 800387

Equipment Location: 650 S. Wilson (Schlinger Laboratory)
Pasadena, CA 91106

PERMIT TO OPERATE, NO PERMIT TO CONSTRUCT

A/N 502627—Title V Revision

Rev. 14--De minimis significant Title V revision.

This revision consists of adding the Permit to Operate for an existing emergency ICE with diesel particulate filter, A/N 502626, to the facility permit. The facility installed the engine during the permit moratorium.

A/N 502626—Existing Emergency ICE with Diesel Particulate Filter

INTERNAL COMBUSTION ENGINE, CUMMINS, MODEL NO. QST30-G5, DIESEL-FUELED, FOUR- CYCLE, 12 CYLINDERS, TURBOCHARGED, AFTERCOOLED, RATED AT 1490 BHP, EQUIPPED WITH A DIESEL PARTICULATE FILTER SYSTEM, CLEANAIR SYSTEMS, MODEL PERMIT™, AND A HIBACK DATA LOGGING AND ALARM SYSTEM WITH BACK PRESSURE MONITOR, DRIVING AN EMERGENCY ELECTRICAL GENERATOR, 1000 KW (SCHLINGER LABORATORY).

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE 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.
[RULE 431.2, RULE 1470]
4. THIS ENGINE SHALL NOT BE OPERATED 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 1470, RULE 1303(a)(1)-BACT, RULE 1304(a)(4)]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING & COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

PAGES	PAGE
13	2
APPL. NO.	DATE
502626, 502627	8/17/10
PROCESSED BY	CHECKED BY
V. Lee	

5. OPERATING BEYOND THE 50 HOURS PER YEAR ALLOTTED FOR MAINTENANCE AND TESTING PURPOSES 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 UTILITY DISTRIBUTION COMPANY 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 1303(a)(1)-BACT, 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 1470, RULE 1303(a)(1)-BACT, RULE 1304(a)(4)]
7. AN ENGINE OPERATING LOG SHALL BE KEPT AND MAINTAINED, DOCUMENTING 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 TOTALIZING HOUR METER READING (IN HOURS AND TENTHS OF HOURS) AT THE BEGINNING AND END OF OPERATION.
[RULE 1110.2, RULE 1470]

8. ON OR BEFORE JANUARY 15TH 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.

THE 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 1110.2, RULE 1470, RULE 3004]

9. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED TO A DIESEL PARTICULATE FILTER SYSTEM WHICH IS IN FULL OPERATION AND IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 1303(a)(1)-BACT]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	3
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

10. THE OPERATOR SHALL OPERATE THE DIESEL PARTICULATE FILTER SYSTEM ONLY WITH AN OPERATIONAL HIBACK DATA LOGGING AND ALARM SYSTEM WITH BACK PRESSURE MONITOR AND TEMPERATURE MONITOR.
[RULE 1303(a)(1)-BACT]
11. THE HIBACK DATA LOGGING AND ALARM SYSTEM SHALL BE PROGRAMMED TO PROVIDE A RED WARNING SIGNAL AND AN AUDIBLE ALARM, WHENEVER THE ENGINE BACKPRESSURE REACHES THE MAXIMUM BACKPRESSURE LIMIT OF 32 INCHES OF WATER. IN OPERATION, THE ENGINE BACKPRESSURE SHALL NOT EXCEED 32 INCHES OF WATER.
[RULE 1303(a)(1)-BACT]
12. THE ENGINE SHALL BE OPERATED AT THE LOAD LEVEL REQUIRED TO ACHIEVE AN ENGINE EXHAUST GAS TEMPERATURE OF 662 DEGREES FAHRENHEIT (350 DEGREES CENTIGRADE) FOR PASSIVE REGENERATION OF THE DIESEL PARTICULATE FILTER FOR AT LEAST 30% OF THE OPERATING TIME.
[RULE 1303(a)(1)-BACT]
13. THIS ENGINE SHALL NOT BE OPERATED BELOW THE PASSIVE REGENERATION TEMPERATURE SPECIFIED IN CONDITION NO. 12 FOR MORE THAN 240 CONSECUTIVE MINUTES.
[RULE 1303(a)(1)-BACT]
14. THE OPERATOR SHALL REGENERATE THE DIESEL PARTICULATE FILTER AFTER EVERY 12 COLD STARTS OR WHENEVER A YELLOW WARNING SIGNAL INDICATING THE BACKPRESSURE IS 26 INCHES OF WATER IS RECEIVED FROM THE HIBACK ALARM SYSTEM, WHICHEVER OCCURS FIRST. IN ORDER TO ACHIEVE FILTER REGENERATION, THE OPERATOR SHALL OPERATE THE ENGINE AT THE LOAD REQUIRED TO ACHIEVE AN EXHAUST TEMPERATURE ABOVE 662 DEGREES FAHRENHEIT (350 DEGREES C) UNTIL THE BACKPRESSURE MONITORING SYSTEM INDICATES A NORMAL BACK PRESSURE READING.
[RULE 1303(a)(1)-BACT]
15. THE DIESEL PARTICULATE FILTER SHALL BE CLEANED WHENEVER THE BACKPRESSURE REACHES THE MAXIMUM BACKPRESSURE LIMIT SPECIFIED IN CONDITION NO. 11. CLEANING SHALL BE PERFORMED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS IN THE INSTALLATION AND MAINTENANCE MANUAL.
[RULE 1303(a)(1)-BACT]
16. AFTER EVERY 2500 HOURS OF NORMAL ENGINE OPERATION, THE OPERATOR SHALL INSPECT THE INTEGRITY OF THE DIESEL PARTICULATE FILTER AND, IF NECESSARY, REPLACE IT.
[RULE 1303(a)(1)-BACT]
17. THE OPERATOR SHALL MAINTAIN RECORDS OF DIESEL PARTICULATE FILTER INSPECTIONS, REPLACEMENTS AND CLEANING FOR A MINIMUM OF FIVE YEARS.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	4
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

THE RECORDS SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 1303(a)(1)-BACT, RULE 3004]

18. THE OPERATOR SHALL MAINTAIN MONTHLY RECORDS OF EXHAUST TEMPERATURE, ENGINE BACK PRESSURE, DATE AND TIME FOR THE DUTY CYCLE OF THE ENGINE AS RECORDED BY THE HIBACK DATA LOGGING AND ALARM SYSTEM FOR A MINIMUM OF FIVE YEARS. THESE RECORDS SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 1303(a)(1)-BACT, RULE 3004]

Emissions and Requirements:

19. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:
PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS
PM: RULE 1470

BACKGROUND

California Institute of Technology (ID 800387), a private university, is a Title V facility. The renewal Title V facility permit was issued on 11/28/06.

On 9/24/09, the facility submitted A/N 502627 for a P/C to construct an ICE, Cummins, Model No. QST30-G5, rated at 1490 BHP, to drive an emergency electrical generator. This engine was proposed to provide emergency power to two buildings. Initially, it would serve the new Schlinger Laboratory. Later in the project, it would also serve the Beckman Behavioral Biology Building by replacing the existing emergency ICE (Harvester, Model No. V549, 172 bhp), permitted under D43676 (A/N 222133).

The proposed ICE is on the AQMD Certified ICE - Emergency Generator list, certified as an EPA Tier 2 engine until 12/31/10. This engine, however, is required to be permitted, rather than registered, because the facility is a Title V facility. The engine, however, is not located within 1000 feet from a K-12 school.

The permit moratorium prevented the issuance of the P/C in 2009 because the Rule 1304 offset exemption for emergency equipment was not available due to a Superior Court decision in November 2008. The Schlinger Laboratory was due for completion in March 2010. On 12/9/09, however, the applicant indicated the engine had already been installed to serve the new Schlinger Laboratory. Consequently, the application was converted to a P/O, no P/C application. On 12/18/10, the applicant submitted a check for \$1025.76 for the 50% penalty.

On 6/4/10, the construction of the engine to serve the Beckman Behavioral Biology Building was completed. The permit for the replaced engine, D43676 (A/N 222133), has been inactivated by Permit Services and will be removed from the facility permit.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	5
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

On 6/11/10, the facility completed the installation of the diesel particulate filter (DPF) (CleanAIR Systems, Model PERMIT™), and a HiBACK Data Logging and Alarm System with back pressure monitor. The installation of the DPF was required by LAER. The installation had been delayed because the filter received in April was the incorrect size.

On 6/11/10, Ralph Wintersberger from CleanAir Systems, and Tommy Trieu and a load bank tech from Cummins Cal Pacific conducted a site inspection, a load bank test, and backpressure tests. At idle load, a load bank is required for the engine exhaust to research the passive regeneration temperature (350 deg C) for the DPF. The exhaust temperature log showed that the exhaust temperature reaches a high of 407 deg C with a load bank. Mr. Trieu also specified backpressure threshold settings for the red alarm (maximum backpressure) and the yellow alarm (normally 10% below maximum backpressure) for the HiBACK, which are documented in a letter, dated 8/13/10. (The backpressure threshold settings are discussed below under PROCESS DESCRIPTION.)

Therefore, a field inspection is not necessary, and the draft facility permit is ready to be submitted to EPA for the 45-day review for a de minimis significant Title V revision.

PROCESS DESCRIPTION

The ICE, Cummins, Model No. QST30-G5, rated at 1490 BHP, drives an emergency electrical generator, 1000 kw. As discussed below under the BACT analysis, LAER requires a DPF. Consequently, the facility installed a CleanAIR Systems, Model PERMIT™ diesel particulate filter that is designed to control emissions from diesel engines. This filter system is verified by CARB under Executive Order DE-05-002-02, dated 10/7/08, to reduce emissions of diesel particulate matter consistent with a Level 3 device (greater than or equal to 85 percent reduction), with the use of California diesel fuel with less than or equal to 15 ppm sulfur. Attachment 1 to the EO, entitled "Verified for Stationary Diesel Engines, PERMIT™ DPF, Off-Road Certified Engine Family List ($0 \leq 0.2$ g/bhp-hr PM)," sets forth the engine families for which the filter system is verified. This list includes Cummins Engine Family 6CEXL030.AAD, which includes the proposed engine. (The Cummins engine family for the proposed engine is found on the USEPA 2006 Model Year Certificate of Conformity and the CARB Executive Order U-R-002-0335.)

As the filter is CARB verified, a source test is not required. (Although the CleanAIR Systems proposal, dated 12/11/09, asserts VOC and CO are reduced by 90%, this evaluation will not recognize those reductions because emissions reductions are CARB verified for PM only.)

The filter is a catalyzed diesel particulate filter that is designed to reduce emissions of particulate (smoke), carbon monoxide and hydrocarbon from diesel engines. The catalyst on the ceramic walls oxidizes carbon monoxide into carbon dioxide, and hydrocarbons into water and carbon dioxide.

The filter consists of a cordierite ceramic honeycomb with hundreds of parallel channels. The arrangement of the channels is such that the exhaust gases carrying the carbon particles are

<p style="text-align: center;">SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</p> <p style="text-align: center;"><i>ENGINEERING & COMPLIANCE</i></p> <p style="text-align: center;">APPLICATION PROCESSING AND CALCULATIONS</p>	PAGES	PAGE
	13	6
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

forced through the fine pores of the walls, which filters out the particles. As the carbon particles are collected on the ceramic walls, the backpressure on the engine will increase. When the temperature of the exhaust is equal to or greater than 350 deg C for 30% of the duty cycle, the catalyst interacts with the collected particulate to burn the particulate into carbon dioxide and water vapor, which passes through the filter. The process is called passive regeneration and cleans the filter.

The CARB verification letter, dated 10/7/08, states that CleanAIR must install the HiBACK, a backpressure monitor, and indicator light on all engines retrofitted with a PERMIT™. The HiBACK is a microprocessor-based data logger and alarm system that records exhaust backpressure and temperature while at the same time monitoring regeneration performance. The HiBACK will alert the operator if the filter is plugging and causing excessive backpressure on the engine. The backpressure must not exceed the specified limit set by the engine manufacturer.

The Cummins manufacturing specifications indicated a maximum backpressure of 27 inches of water for this engine. Normally, the red alarm threshold would be set at 27 inches (maximum backpressure) and the yellow alarm threshold would be set at 24 inches (normally 10% below maximum backpressure). At the site inspection on 6/11/10, however, Tommy Trieu from Cummins Cal Pacific specified 32 inches for the red alarm threshold and 26 inches for the yellow alarm threshold for the HiBACK settings, after conducting backpressure tests at different loads. The HiBACK as set is compensating for the measurement location's false elevated reading.

The unit has three backpressure alarm outputs available. All outputs are programmable and pre-set before the unit is delivered.

- Output 1: Triggers a yellow LED. This output is set 10% below the maximum recommended backpressure and allows the user time to analyze data and service the filter if needed.

Discussion: Permit condition no. 14 incorporates this output by requiring regeneration when a yellow alarm is received. The yellow alarm threshold is set at 26 inches of water pursuant to Cummins Cal Pacific's recommendation during the site visit on 6/11/10.

- Output 2: Set at the maximum recommended backpressure limit. When this level is reached a red LED is illuminated. User must shut down and service the filter.

Discussion: Permit condition no. 11 incorporates this output. The red alarm threshold is set at 32 inches water pursuant to Cummins Cal Pacific's recommendation during the site visit on 6/11/10. Condition no. 15 requires cleaning whenever the maximum backpressure is reached.

- Output 3: A voltage output that can be used to interface with the engine ECM to initiate a power de-rating mode, turn on an audible alarm, or send a signal to a remote operator.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	7
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
	V. Lee	

Discussion: Permit condition no. 11 incorporates this output. The facility has consulted with Cummins regarding whether the engine can be de-rated or shut down. Cummins explained that since this is not an electronic engine it cannot be de-rated or shutdown via this output. The third output, however, can be connected to an alarm siren or beacon. Condition no. 11 requires an audible alarm. Condition no. 15 requires cleaning whenever the maximum backpressure is reached.

Further, CARB Executive Order DE-05-002-02 (EO) sets forth operating criteria to which the verification is subject. In addition, the CleanAIR Systems proposal, dated 12/11/09, sets forth PERMIT™ filter specifications. Compliance with all conditions is discussed below.

1. Executive Order--Engine type is diesel, with or without turbocharger, without Exhaust-Gas Recirculation (EGR), mechanically or electronically controlled, certified Tier 1, Tier 2 or Tier 3 off-road engines that have particulate matter (PM) emissions of less than or equal to 0.2 g/bhp-hr.

Discussion: As discussed above, EO Attachment 1: Verified for Stationary Diesel Engines, PERMIT™ DPF, Off-Road Certified Engine Family List ($0 \leq 0.2$ g/bhp-hr PM) lists Cummins Engine Family 6CDXL030.AAD, which includes the proposed engine.

2. Executive Order--The maximum consecutive minutes at idle is 240 minutes.

Discussion: Condition no. 13 implements this requirement.

3. Executive Order--The number of 10 minute idle sessions before regeneration is recommended is 12 consecutive sessions, and before regeneration is required is 24.

Filter Specification—The number of stationary cold starts is 12 consecutive 10 minute idle sessions followed by 2 hours regeneration.

Discussion: As the filter specification requirement is more stringent, this requirement is incorporated in condition no. 14 which sets forth the conditions under which regeneration is required.

4. Executive Order--The minimum temperature/load/time requirements for regeneration in 4-stroke engines is that the engine must operate at a load level sufficient to achieve an exhaust temperature (300 °C) required for regeneration for 30% of the operating time or 2 hours, which is longer. For most engines, 40% load results in temperature of at least 300 °C.

Filter Specification—Regeneration for engine using ultra low sulfur diesel (< 15 ppm) is above 350 deg C (662 deg F) for 30% of the engine operating time and greater than 40% engine load.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	8
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
	V. Lee	

Discussion: As the filter specification requirement is more stringent, condition no. 12 implements this requirement. According to Cummins, the engine will run at 435°C (816° F) at full load.

At idle load, a load bank is necessary to achieve the required 350 deg C. The exhaust temperature log for the load bank test conducted on 6/11/10 indicated the exhaust temperature reached a high of 407 deg C.

- Executive Order--The number of hours of operation before cleaning or disposal of the filter is required is 5000 hours under normal operating conditions.

Filter Specification—Cleaning is required in 2500 hour intervals.

Discussion: Condition no. 15 requires cleaning when the back pressure reaches the allowable maximum limit. Condition no. 16 requires a filter inspection and replacement, if necessary, after 2500 hours of operation, pursuant to the filter specification. Over time, the filter may plug as it traps noncombustible ash, such as calcium, from the lube oil.

- Executive Order--The fuel is California diesel fuel with less than or equal to 15 ppm sulfur.

Discussion: Condition no. 3 requires compliance with Rule 431.2, which imposes the same sulfur content limit.

EMISSIONS CALCULATIONS

Operating schedule: 50 wk/yr, 1 day/wk, 1 hr/day

NO_x

NO_x, uncontrolled = NO_x, controlled

$$\begin{aligned} \text{NO}_x, \text{ lb/hr} &= (1490 \text{ bhp}) (4.4 \text{ g/bhp-hr per AQMD certification}) (\text{lb}/454 \text{ g}) = 14.44 \text{ lb/hr} \\ \text{lb/day} &= (14.44 \text{ lb/hr}) (1 \text{ hr/day}) = 14.44 \text{ lb/day} \\ 30 \text{ DA} &= (14.44 \text{ lb/day}) (1 \text{ day/wk} \times 4.2 / 30 \text{ days}) = 2.02 \text{ lb/day} \rightarrow 2 \text{ lb/day} \end{aligned}$$

CO

CO, uncontrolled = CO, controlled.

$$\begin{aligned} \text{CO, lb/hr} &= (1490 \text{ bhp}) (0.52 \text{ g/bhp-hr per AQMD certification}) (\text{lb}/454 \text{ g}) = 1.71 \text{ lb/hr} \\ \text{lb/day} &= (1.71 \text{ lb/hr}) (1 \text{ hr/day}) = 1.71 \text{ lb/day} \\ 30 \text{ DA} &= (1.71 \text{ lb/day}) (1 \text{ day/wk} \times 4.2 / 30 \text{ days}) = 0.24 \text{ lb/day} \rightarrow 0 \text{ lb/day} \end{aligned}$$

VOC

VOC, uncontrolled = VOC, controlled

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	9
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

VOC, lb/hr = (1490 bhp) (0.22 g/bhp-hr per AQMD certification) (lb/454 g) = 0.72 lb/hr
 lb/day = (0.72 lb/hr) (1 hr/day) = 0.72 lb/day
 30 DA = (0.72 lb/day) (1 day/wk x 4.2 /30 days) = 0.10 lb/day → 0 lb/day

SO_x

SO_x, uncontrolled = SO_x, controlled

SO_x, lb/hr = (1490 bhp) (0.0049 g/bhp-hr for 15 ppmw fuel) (lb/454 g) = 0.02 lb/hr
 lb/day = (0.02 lb/hr) (1 hr/day) = 0.02 lb/day
 30 DA = (0.02 lb/day) (1 day/wk x 4.2 /30 days) = 0.003 lb/day → 0 lb/day

PM₁₀

PM₁₀, uncontrolled

PM₁₀, uncontrolled, lb/hr = (1490 bhp) (0.08 g/bhp-hr PM per AQMD certification)
 (0.96 PM₁₀/PM) (lb/454 g) = 0.25 lb/hr
 lb/day = (0.25 lb/hr) (1 hr/day) = 0.25 lb/day

PM₁₀, controlled is reduced by 85% by the diesel particulate filter.

PM₁₀, controlled, lb/hr = (0.25 lb/hr) (1 - 0.85) = 0.0375 lb/hr
 lb/day = (0.0375 lb/day) (1 hr/day) = 0.0375 lb/day
 30 DA = (0.0375 lb/day) (1 day/wk x 4.2 /30 days) = 0.0053 lb/day → 0 lb/day

RULE EVALUATION

This emergency ICE is expected to comply with all applicable SCAQMD rules and regulations as follows:

Rule 212—Standards for Approving Permits and Issuing Public Notice

Public notice is not required for the installation of this emergency ICE, as discussed below:

(c)(1)—Public notice is not required because the applicant has determined that the engine is not located within 1000 feet from the outer boundary of any K-12 school. The applicant determined the engine is located 1280 ft from Polytechnic School, 1030 E. California Blvd., Pasadena 91106. Polytechnic School is a private school for kindergarten to 12th grade with approximately 857 students. In addition, the applicant determined the engine is located 2,160 ft from St. Philip School (aka St. Philip the Apostle), 1363 Cordova St, Pasadena. St. Philip is a private school for kindergarten to 8th grade with approximately 530 students.

(c)(2)—Public notice is not required because the on-site emission increases from the installation of the emergency engine will not exceed any of the daily maximum thresholds set forth in subsection (g).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	10
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

(c)(3)—This subsection regarding cancer risk is not applicable because emergency ICEs are exempt from Rule 1401, pursuant to Rule 1401(g)(1)(F).

Rule 401—Visible Emissions

Based on experience with similar equipment, the engine is expected to comply with the opacity limits.

Rule 402—Nuisance

Based on experience with similar equipment, nuisance complaints are not expected. A check of the public complaints database for the last five years indicates no public complaints had been received.

Rule 404—Particulate Matter - Concentration

Based on experience with similar equipment, compliance with the rule requirements are expected.

Rule 407—Liquid and Gaseous Air Contaminants

The engine is exempt per section (b)(1), which exempts stationary internal combustion engines.

Rule 431.2—Sulfur Content of Liquid Fuels

Compliance is expected to comply with the requirement that diesel fuel supplied to equipment is to contain 15 ppm or less sulfur by weight. This is implemented by condition no. 3.

Rule 1110.2—Emissions from Gaseous- and Liquid-Fueled Engines

Section (h)(2) provides that the provisions of subdivision (d)—Requirements shall not apply to emergency standby engines, which have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.

Regulation XIII—New Source Review

- Rule 1303(a)—BACT
 - BACT Requirements
Part D of the BACT Guidelines, entitled “BACT Guidelines for Non-Major Polluting Facilities” was consulted. The BACT guidelines for I.C. Engine, Stationary, Emergency, Compression-Ignition, Rev. 4, dated 10-3-08, set forth emissions limits for NOx + NMHC, SOx, CO, and PM. Footnote 3 restricts operation to 50 hours for maintenance and testing, or less if required by Rule 1470, and set forth the parameters for allowed operation beyond the 50 hours.

As shown below, the emission levels for the proposed engine comply with the required Tier 2 standards.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	11
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

	NO _x + NMHC	SO _x	CO	PM
BACT Limits ≥ 750 hp	Tier 2 4.8 g/bhp-hr	Diesel fuel with a sulfur content no greater than 0.0015% by wt. (Rule 431.2)	Tier 2 2.6 g/bhp-hr	Compliance with Rule 1470: ≤ 0.15 g/bhp-hr Tier 2 0.15 g/bhp-hr
AQMD Engine Certification File, A/N 455112	4.62 g/bhp-hr		0.52 g/bhp-hr	0.08 g/bhp-hr

The restriction of operation to 50 hours for maintenance and testing is implemented by condition no. 4, and the parameters for allowed operation beyond the 50 hours are set forth in condition no. 5.

- LAER

Rule 1303(a)(2) provides that BACT for sources located at major polluting facilities shall be at least as stringent as Lowest Achievable Emissions Rate (LAER) as defined in the federal Clean Air Act Section 171(3). For major polluting facilities, the lowest achievable emission rate (LAER) is determined on a permit-by-permit basis.

Part B of the BACT Guidelines, entitled “LAER/BACT Determinations for Major Polluting Facilities” was consulted. Section I – AQMD LAER/BACT Determinations shows that Claremont Manor (ID 86710) required a DPF for the emergency ICE (550 bhp). Although not listed in the LAER/BACT database, Mountainview Generating System (ID 121737) has a diesel black start ICE (2155 bhp) with a filter already in operation. Thus, a DPF is considered achieved in practice. In accordance, the P/C’s for the new Canyon Power Plant (ID 153992) required a DPF for the black start ICE (1141 bhp), and the P/C’s for the City of Riverside Public Utilities Dept. (ID 139796) power plant expansion required a DPF for the black start ICE (1502 bhp). For an emergency ICE, LAER requires a diesel particulate filter.

Cal Tech is a major polluting facility. The proposed CleanAIR Systems, Inc. PERMIT™ diesel particulate filter meets the LAER requirement.

- Rule 1303(b)(1)—Modeling
- Rule 1303(b)(2)—Offsets

The engine is exempt from modeling and offset requirements per Rule 1304(a)(4), which exempts a source exclusively used as emergency standby equipment for nonutility electrical power generation, provided the source does not operate more than 200 hours per year as evidenced by an engine-hour meter. Condition no. 4 limits operation to no more than 200 hours in any one year, and condition no. 6 requires an operational non-resettable elapsed operating time meter.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	12
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
V. Lee		

Rule 1401—New Source Review of Toxic Air Contaminants

The engine is exempt per section (g)(1)(F), which exempts emergency internal combustion engines that are exempted under Rule 1304.

Rule 1470—Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines

(b)(6)--This defines a “new engine” as a stationary CI engine installed at a facility after January 1, 2005. As the engine was installed approximately on 12/9/09, it is a “new engine” for the purpose of this rule.

(c)(2)(A)—As this engine is not located 500 feet or less from a school, these limits on non-emergency operation are not applicable.

(c)(2)(C)(i)(I)—New stationary emergency standby diesel-fueled engines (> 50 bhp), located greater than 100 meters from an existing school, shall emit diesel PM at a rate less than or equal to 0.15 g/bhp-hr. This engine will be in compliance because the uncontrolled emissions level for PM is 0.08 g/bhp-hr.

(c)(2)(C)(i)(III)— New stationary emergency standby diesel-fueled engines (> 50 bhp), located greater than 100 meters from an existing school, shall not operate more than 50 hours per year. This subclause does not limit engine operation for emergency use and emission testing. Thus, condition no. 4 limits the maintenance and performance testing to 50 hours.

Reg 3005—Title V Permit Revisions

The facility is not in the RECLAIM program. The proposed project is considered as a “de minimis significant permit revision” to the Title V permit for this facility.

Rule 3006(b)(6) defines a “de minimis significant permit revision” as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or hazardous air pollutants (HAPs) from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

Air Contaminant	Daily Maximum (lbs/day)
HAP	30
VOC	30
NO _x	40
PM ₁₀	30
SO _x	60
CO	220

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	13	13
	APPL. NO.	DATE
	502626, 502627	8/17/10
	PROCESSED BY	CHECKED BY
	V. Lee	

To determine if a project is considered as a “de minimis significant permit revision” for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the 12th permit revision to the Title V renewal permit issued to this facility on November 28, 2006 as Revision 2.

See memo supplementing this evaluation, dated 8/13/10, for the table that summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued.

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a “de minimis significant permit revision.”

RECOMMENDATION

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a “de minimis significant permit revision,” it is exempt from the public participation requirements under Rule 3006(b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.