

**Draft Engineering Evaluation for Application #27611**  
**Facebook Inc.,**  
**1080 Hamilton Ct. Menlo Park CA 94025**  
**Plant #23407**

**BACKGROUND**

Facebook Inc. has applied for a Permit to Operate the following equipment:

**S-1            Emergency Diesel Engine, 324 bhp, 2.03 MMBtu/hr, Tier III**  
**Manufacturer: Cummins Inc.**  
**Engine Family: FCEXL0409AAD, Model: QSB7-G5 NR3, Model Year: 2015**

The equipment will be located at 1080 Hamilton Ct., Menlo Park CA 94025. This engine is CARB and EPA certified. 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 estimate the criteria pollutant and HAP emissions associated with the operation of S-1 and will discuss the compliance of this engine with applicable rules and regulations. S-1 is subject to Permit Condition No. 22850.

**EMISSIONS CALCULATIONS**

Emissions are calculated based on the following engine specifications and operating hours:

Engine Power	324	bhp
Fuel Consumption	14.8	gal/hr
BTU Capacity of Diesel	137000	Btu/gal
Engine Firing Rate	2.02	MMBtu/hr
Hours of operation	50	hr/year

Criteria pollutant emissions resulting from the operation of S-1 are presented in Table 1. Emission factors were obtained from the compliance statement for 2015 Model Year engines belonging to Engine Family FCEXL0409AAD manufactured by Cummins Inc. SO<sub>2</sub> emissions were calculated as follows, using a 15 ppm sulfur content for ultra-low- sulfur diesel:

$$SO_2 \text{ emissions} = \frac{0.000015 \text{ lbs S}}{\text{lbs fuel}} * \frac{7.1 \text{ lbs fuel}}{\text{gal fuel}} * \frac{14.8 \text{ gal fuel}}{\text{hr}} * \frac{64 \text{ lbs SO}_2}{32 \text{ lbs S}} = 0.00315 \frac{\text{lbs SO}_2}{\text{hr}}$$

**Table 1: Criteria Pollutant Emissions**

Pollutant	Emission Factor	Emission Factor	Emissions		
	[g/kW-hr]	[g/bhp-hr]	[lbs/day]	[lbs/yr]	[TPY]
NO <sub>x</sub>	3.52	2.57	43.97	91.61	0.046
POC(NMHC)	0.19	0.14	2.31	4.82	0.002
CO	1.00	0.70	12.00	25.00	0.013
PM	0.10	0.07	1.20	2.50	0.001
SO <sub>x</sub>	N/A	N/A	0.08	0.16	0.000

A combined emission factor for NO<sub>x</sub> and NMHC (POC) was reported; 95% of that was assumed to be NO<sub>x</sub> and 5% NMHC (POC). Daily emissions were based on 24 hours of operation.

### **PLANT CUMULATIVE INCREASE**

Facebook Inc. has multiple locations. This particular facility (Plant # 23407) is a new facility. Even though this particular location (Plant #23407) does not have any existing emissions, for the purposes of calculating offsets, emissions from Facebook's other facility (Plant # 20668) are considered because it is located less than 3 miles (~0.4 miles) away, pursuant to Regulation 2-2215.3. Table 2 contains a summary the increases in criteria pollutant emissions resulting from the operation of S-1.

**Table 2: Cumulative Increase in Emissions**

Pollutant	Existing Emissions (Plant #20668)	New Emissions (Plant #23407)	Total Emissions
	[TPY]	[TPY]	[TPY]
NO <sub>x</sub>	0.308	0.046	0.354
POC(NMHC)	0.016	0.002	0.018
CO	0.034	0.013	0.047
PM <sub>10</sub>	0.000	0.001	0.001
SO <sub>x</sub>	0.000	0.000	0.000

### **TOXIC RISK SCREENING**

This application requires a Toxics Risk Screening Analysis because the diesel particulate emissions from the operation of S-1 are greater than the toxic trigger level (Table 3). Although a risk screening is required, this application qualifies for the District's Health Risk Screening Analysis (HRSA) streamlining policy for stationary diesel-fired internal combustion engines used for backup power or fire pumps. This implies that a detailed analysis is not required; a streamlined version is sufficient.

**Table 3: Toxic Emissions**

Pollutant	Chronic Trigger Level	Acute Trigger Level	Emission Factor	Emissions	HRSA Triggered?
	[lbs/yr]	[lbs/hr]	[g/bhp-hr]	[lbs/yr]	
Diesel exhaust PM	0.34	None	0.07	2.50	Yes

The streamlined HRSA policy applies to applications that have new and modified stationary diesel-fired engines that provide power to emergency standby generators or fire pumps, except for emergency engines located at data centers or internet service exchanges. This project is in compliance with the health risk standards based on the HRSA streamlining policy.

S-1 also meets Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 g/bhp-hr.

### **BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>. BACT is triggered for NO<sub>x</sub>, CO and POC since the maximum daily emissions of each of these pollutants exceed 10 lb/day per source (see Table 1).

BACT standards are listed in the BAAQMD BACT/TBACT Workbook section for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 7 dated 12/22/2010. Based on its hp rating, this engine meets the CARB ATCM standard for NO<sub>x</sub>, CO and POC (Table 4). BACT (2) requirements, which are based on the CARB ATCM standards, are met for NO<sub>x</sub>, CO and POC (Table 4). The more restrictive BACT (1) standards are not applicable to this engine because it will be limited to operation as an emergency standby engine.

**Table 4: BACT Standards**

Pollutant	CARB ATCM Standard	Engine
	[g/kW-hr] ([g/bhp-hr])	[g/kW-hr] ([g/bhp-hr])
NO <sub>x</sub> +NMHC	4.0 (3.0)	3.7 (2.7)
CO	3.5 (2.6)	1.0 (0.7)

### **OFFSETS**

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons/yr of POC or NO<sub>x</sub>. Based on the emissions displayed in Table 2, offsets are not required for this application.

### **NSPS**

The engine is subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

S-1 has a total displacement of 6.7 liters and has 6 cylinders. Therefore, each cylinder has a volume of less than 10 liters. The engine is a 2015 model year engine and is not a fire pump engine. Section 60.4205(b) requires these engines to comply with the emission standards in Section 60.4202, which refers to 40CFR89.112 and 40CFR89.113 for all pollutants.

For engines greater than or equal to 560 kW, the NSPS standards are listed in Table 5. S-1 complies with the standards for all pollutants.

**Table 5: NSPS Standards for Tier 3 engines after 2006, 225 <kW <450**

Pollutant	NSPS Standard	Engine
	[g/kW-hr] ([g/bhp-hr])	[g/kW-hr] ([g/bhp-hr])
NO <sub>x</sub> +NMHC	4.0 (3.0)	3.7 (2.7)
CO	3.5 (2.6)	1.0 (0.7)
PM <sub>10</sub>	0.2 (0.15)	0.1 (0.07)

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine. The owner/operator is expected to comply with this requirement.

Section 60.4207(b) requires that by October 1, 2010, the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and the same cetane index or aromatic content as above. The owner/operator is expected to comply with this requirement because CARB diesel is mandatory in California.

Section 60.4209(a) requires the engine to have a non-resettable hour meter. This requirement is already in the standard permit conditions.

The engine is expected to comply with the requirements of Section 60.4211(c) because it has been certified in accordance with 40 CFR Part 89.

The engine is expected to comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because it is limited by permit conditions to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions. The owner/operator is expected to comply with these general provisions.

### **NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs)**

S-1 is subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE). Per 40 CFR 63.6590(a)(2)(iii), S-1 is an affected source and is classified as a new stationary RICE located at an area source since construction commenced after June 12, 2006. Per 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE located at an area source must meet the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines. This engine is in compliance

with the requirements of 40 CFR part 60 subpart IIII, as indicated in the NSPS section of this evaluation.

### **CARB STATIONARY DIESEL ENGINE ATCM**

The State Office of Administrative Law approved the Airborne Toxic Control Measure (ATCM) on November 8, 2004. State law requires the local Air Districts to implement and enforce the requirements of the ATCM. Effective January 1, 2005, there is a prohibition on the operation of new diesel emergency standby engines greater than 50 bhp unless the following operating requirements and emission standards are met:

***“Stationary Diesel Engine ATCM” section 93115, title 17, CA Code of Regulations.***  
**Emissions Standards and Hours of Operating Requirements for New Stationary  
Emergency Standby Diesel-Fueled Engines (>50 bhp):**

- a. meet the applicable emission standards for all pollutants for the same model year and maximum horsepower rating as specified in Table 1 Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines, in effect on the date of acquisition or submittal, as defined in section 93115.4, and
- b. after December 31, 2008, be certified to the new nonroad compression-ignition (CI) engine emission standards for all pollutants for 2007 and later model year engines as specified in 40 CFR, PART 60, Subpart IIII-Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (2006); and
- c. not operate more than 50 hours per year for maintenance and testing purposes, except as provided in 93115.6(a)(3)(A)2. This subsection does not limit engine operation for emergency use and for emission testing to show compliance with 93115.6(a)(3).

Emergency standby diesel engine S-1 (1) meets the emission standards for all pollutants set in Table 1 (below) Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines, (2) is subject to and in compliance with the EPA Tier 3 off-road CI engine standards, and (3) will operate for no more than 50 hours per year for maintenance and reliability testing per engine. Therefore, the diesel engine is in compliance with the above ATCM requirements.

**Table 1: Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines g/bhp-hr (g/kW-hr)**

Maximum Engine Power	Model year(s)	PM	NMHC+NOx	CO
50 ≤ HP < 75 (37 ≤ kW < 56)	2007	0.15 (0.20)	5.6 (7.5) 3.5 (4.7)	3.7 (5.0)
	2008+			
75 ≤ HP < 100 (56 ≤ kW < 75)	2007	0.15 (0.20)	5.6 (7.5) 3.5 (4.7)	3.7 (5.0)
	2008+			
100 ≤ HP < 175 (75 ≤ kW < 130)	2007	0.15 (0.20)	3.0 (4.0)	3.7 (5.0)
	2008+			
175 ≤ HP < 300 (130 ≤ kW < 225)	2007	0.15 (0.20)	3.0 (4.0)	2.6 (3.5)
	2008+			
300 ≤ HP < 600 (225 ≤ kW < 450)	2007	0.15 (0.20)	3.0 (4.0)	2.6 (3.5)
	2008+			
600 ≤ HP < 750 (450 ≤ kW < 560)	2007	0.15 (0.20)	3.0 (4.0)	2.6 (3.5)
	2008+			
HP > 750 (kW > 560)	2007	0.15 (0.20)	4.8 (6.4)	2.6 (3.5)
	2008+			

1. May be subject to additional emission limitations as specified in current applicable district rules, regulations or policies.

## **STATEMENT OF COMPLIANCE**

Source S-1 is subject to and expected to be in compliance with the requirements of District Regulation 1-301 (*Public Nuisance*), Regulation 6-1-303 (*Particulate Matter and Visible Emissions*), Regulation 9-1 (*Sulfur Dioxide*) and Regulation 9-8 (*NOx and CO from Stationary Internal Combustion Engines*). In order to ensure compliance with the requirements of these regulations, the facility will be conditionally permitted to meet the requirements.

According to Regulation 1-301, no person shall discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30 day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.

S-1 is subject to the limitations of Regulation 6-1-303 (*Particulate Matter*). Regulation 6-1-303 states that a person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where such device is required by District Regulations, be equal to or greater than 40% opacity. This low PM<sub>10</sub> emitting engine is not expected to produce visible emissions or fallout in violation of this regulation, and it will be assumed to be in compliance with Regulation 6 pending a regular inspection.

S-1 is also subject to the SO<sub>2</sub> limitations of Regulation 9-1-301 (*Limitations on Ground Level Concentrations of Sulfur Dioxide*), Regulation 9-1-302 (*Limitations Sulfur Dioxide Emissions*) and 9-1-304 (*Burning of Solid and Liquid Sulfur Dioxide Fuel*). From Regulation 9-1-301, the ground level concentrations of SO<sub>2</sub> will not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Per Regulation 9-1-302, a person shall not emit from any source a gas stream containing sulfur dioxide in excess of 300 ppm (dry). And Regulation 9-1-304, states that a person shall not burn any liquid fuel having sulfur content in excess of 0.5% by weight. Compliance with Regulation 9-1 is very likely since diesel fuel with a 0.0015% by weight sulfur is mandated for use in California.

From Regulation 9-8 (*NO<sub>x</sub> and CO from Stationary Internal Combustion Engines*), Section 110.5 (*Emergency Standby Engines*), S-1 is exempt from the requirements of Regulations 9-8-301 (*Emission Limits on Fossil Derived Fuel Gas*), 9-8-302 (*Emission Limits on Waste Derived Fuel Gas*), 9-8-303 (*Emissions Limits – Delayed Compliance, Existing Spark-Ignited Engines, 51 to 250 bhp or Model Year 1996 or Later*), 9-8-304 (*Emission Limits – Compression-Ignited Engines*), 9-8-305 (*Emission Limits – Delayed Compliance, Existing Compression-Ignited Engines, Model Year 1996 or Later*), 9-8-501 (*Initial Demonstration of Compliance*) and 9-8-503 (*Quarterly Demonstration of Compliance*). However, it is subject to the monitoring and record keeping procedures described in Regulation 9-8-530 (*Emergency Standby Engines, Monitoring and Recordkeeping*). The requirements of this Regulation are included in the permit conditions below.

S-1 is also subject to and expected to comply with Regulation 9-8-330 (*Emergency Standby Engines, Hours of Operation*) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year.

This application is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3.2)

This facility is located less than 1,000 feet from the nearest school and therefore is subject to the public notification requirements of Regulation 2-1-412. If a school is located within 1000 ft, any schools located within ¼ miles of the facility are also included in the public notice. Mid-Peninsula High School located at 1340 Willow Rd., Menlo Park CA 94025 is located approximately 600 feet from S-1. Cesar Chavez & Green Oaks Academy located at 2450 Ralmar Avenue, East Palo Alto CA 94303 is located within ¼ miles from the facility. A public notice will be prepared and sent to all addresses within 1,000 feet of the emergency generator, and parents and guardians of students at the Mid-Peninsula High School and Cesar Chavez & Green Oaks. All comments received will be summarized in this evaluation report.

This facility is not subject to Prevention of Significant Deterioration (PSD) requirements because it is not major as defined by Regulation 2-6-212.

As determined using the District's HRSA Streamlining Policy Checklist for Stationary Emergency Standby and Fire Pump Diesel Engines, this application qualifies for the District's May 6, 2015 HRSA Streamlining Policy For Stationary Diesel-Fired IC Engines Use for Backup Power of Fire Pumps. Based on this policy, the District has determined that this project will comply with the District's TBACT requirements and will result in health impacts of less than 10 in a million cancer risk and less than 1.0 chronic hazard index based on conservative HRSA screening procedures. Therefore, this project will comply with Regulation 2, Rule 5 Sections 301 and 302. A refined HRSA is not required for this application.

### **PERMIT CONDITIONS**

#### CONDITION 22850

1. Operating for reliability-related activities is limited to 50 hours per year per engine.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

2. 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 hours while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1)]

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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), (or Regulation 2-6-501)]

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 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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e)(2)(B)(2)]

**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 a Permit to Operate for the equipment listed below. However, the proposed source(s) will be located within 1,000 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 and/or a Permit to Operate for the following source(s):

**S-1            Emergency Diesel Engine, 324 bhp, 2.03 MMBtu/hr, Tier III**

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
                  Simrun Dhoot  
                  Air Quality Engineer