

**ENGINEERING EVALUATION**  
**Menlo Business Park, LLC Plant: 18066**  
**Application: 21086**

**BACKGROUND**

Menlo Business Park, LLC has applied to obtain an Authority to Construct (AC) and/or a Permit to Operate (PO) two (2) new diesel powered generator set, S-5 and S-6, and a loss of exemption diesel powered generator set, S-3. The AC and/or PO will be for the following equipment:

**S-3     Emergency Standby Diesel Generator, 2000 Caterpillar, Engine Model:  
3306, 349 BHP**

**S-5     Emergency Standby Diesel Generator, 2009 Perkins, Engine Model: 2506D, 689 BHP**

**S-6     Emergency Standby Diesel Generator, 2006 Komatsu, Engine Model:  
SSA6D125E-5, 399 BHP**

The engines will be located at 1505 O'Brien Drive, Menlo Park, CA 94025. They will be used to provide emergency power in the event of a blackout. Emergency engines must be periodically tested to ensure that they will generate electricity when needed.

The Emergency Diesel Engine Generator Sets (S-3, S-5 and S-6) are designed to minimize the release of airborne criteria pollutants and harmful air toxins due to fuel combustion. The criteria pollutants are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>). POC from a combustion source is denoted as non-methane hydrocarbons (NMHC). All of these pollutants are briefly discussed on the District's website at [www.baaqmd.gov](http://www.baaqmd.gov).

The engines will burn commercially available California low-sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

**EMISSIONS**

S-3 emissions are not calculated, as it is a Loss of Exemption source.

S-5

- Basis:
- 689 bhp output rating
  - 50 hr/yr operation for testing and maintenance
  - NMHC, NO<sub>x</sub>, PM<sub>10</sub> emission factors provided by Manufacturer based on 5-mode testing, submitted to CARB
  - CO emission factors provided by CARB Certification with Executive Order U-R-022-0137
  - 35.7 gal/hour Fuel Consumption based on "Table 1: Standby Diesel Engine Parameters"

NMHC + NO <sub>x</sub> :	2.760 g/bhp-hr
NMHC (~ POC):	0.138 g/bhp-hr
NO <sub>x</sub> :	2.622 g/bhp-hr
CO:	2.163 g/bhp-hr
PM <sub>10</sub> :	0.067 g/bhp-hr

**Annual Average Emissions:**

**NO<sub>x</sub>: (50 hr/yr)(689 hp)(2.622 g/hp-hr)(lb/454 g) = 199 lb/yr = 0.100 tpy**

**POC:** (50 hr/yr)(689 hp)(0.138 g/hp-hr)(lb/454 g) = **10.5 lb/yr = 0.005 tpy**

**CO:** (50 hr/yr)(689 hp)(2.163 g/hp-hr)(lb/454 g) = **164 lb/yr = 0.082 tpy**

**PM<sub>10</sub>:** (50 hr/yr)(689 hp)(0.067 g/hp-hr)(lb/454 g) = **5.09 lb/yr = 0.003 tpy**

**SO<sub>2</sub>:** (50 hr/yr)(689 hp)(0.18 g/hp-hr)(lb/454 g) = **13.7 lb/yr = 0.007 tpy**

**Daily Emissions:**

Daily emissions are calculated to establish whether a source triggers the requirement for BACT (10 lb/highest day total source emissions for any class of pollutants). 24-hr/day operation will be assumed.

**NO<sub>x</sub>:** (24 hr/day)(689 hp)(2.622 g/hp-hr)(lb/454 g) = **95.5 lb/day**

**POC:** (24 hr/day)(689 hp)(0.138 g/hp-hr)(lb/454 g) = **5.0 lb/day**

**CO:** (24 hr/day)(689 hp)(2.163 g/hp-hr)(lb/454 g) = **78.8 lb/day**

**PM<sub>10</sub>:** (24 hr/day)(689 hp)(0.13 g/hp-hr)(lb/454 g) = **2.5 lb/day**

**SO<sub>2</sub>:** (24 hr/day)(689 hp)(0.18 g/hp-hr)(lb/454 g) = **6.6 lb/day**

S-6

- Basis:
- 399 bhp output rating
  - 50 hr/yr operation for testing and maintenance
  - NMHC, NO<sub>x</sub>, PM<sub>10</sub> emission factors provided by Manufacturer based on 5-mode testing, submitted to CARB
  - CO emission factors provided by CARB Certification with Executive Order U-R-005-0240
  - 20.7 gal/hour Fuel Consumption based on "Table 1: Standby Diesel Engine Parameters"

NMHC + NO <sub>x</sub> :	2.537 g/bhp-hr
NMHC (~ POC):	0.127 g/bhp-hr
NO <sub>x</sub> :	2.410 g/bhp-hr
CO:	0.821 g/bhp-hr
PM <sub>10</sub> :	0.127 g/bhp-hr

**Annual Average Emissions:**

**NO<sub>x</sub>:** (50 hr/yr)(399 hp)(2.410 g/hp-hr)(lb/454 g) = **106 lb/yr = 0.053 tpy**

**POC:** (50 hr/yr)(399 hp)(0.127 g/hp-hr)(lb/454 g) = **5.57 lb/yr = 0.003 tpy**

**CO:** (50 hr/yr)(399 hp)(0.821 g/hp-hr)(lb/454 g) = **36.1 lb/yr = 0.018 tpy**

**PM<sub>10</sub>:** (50 hr/yr)(399 hp)(0.127 g/hp-hr)(lb/454 g) = **5.57 lb/yr = 0.003 tpy**

**SO<sub>2</sub>:** (50 hr/yr)(399 hp)(0.18 g/hp-hr)(lb/454 g) = **7.91 lb/yr = 0.004 tpy**

**Daily Emissions:**

**NO<sub>x</sub>:** (24 hr/day)(399 hp)(2.410 g/hp-hr)(lb/454 g) = **50.1 lb/day**

**POC:** (24 hr/day)(399 hp)(0.127 g/hp-hr)(lb/454 g) = **2.7 lb/day**

**CO:** (24 hr/day)(399 hp)(0.821 g/hp-hr)(lb/454 g) = **17.3 lb/day**

**PM<sub>10</sub>:** (24 hr/day)(399 hp)(0.127 g/hp-hr)(lb/454 g) = **2.7 lb/day**

**SO<sub>2</sub>:** (24 hr/day)(399 hp)(0.18 g/hp-hr)(lb/454 g) = **3.8 lb/day**

**Total Annual Average Emissions:**

**NO<sub>x</sub>:** 0.100 tpy + 0.053 tpy = **0.153 tpy**

**POC:** 0.005 tpy + 0.003 tpy = **0.008 tpy**

**CO:** 0.082 tpy + 0.018 tpy = **0.100 tpy**

**PM<sub>10</sub>:** 0.003 tpy + 0.003 tpy = **0.006 tpy**

**SO<sub>2</sub>:** 0.007 tpy + 0.004 tpy = **0.011 tpy**

**Total Daily Emissions:**

**NO<sub>x</sub>:** 95.5 lb/day + 50.1 lb/day = **146 lb/day**

**POC:** 5 lb/day + 2.7 lb/day = **7.7 lb/day**

**CO:** 78.8 lb/day + 17.3 lb/day = **96.1 lb/day**

**PM<sub>10</sub>:** 2.5 lb/day + 2.7 lb/day = **5.2 lb/day**

**SO<sub>2</sub>:** 6.6 lb/day + 3.8 lb/day = **10.4 lb/day**

**Plant Cumulative Increase:**

Table 1 summarizes the cumulative increase in criteria pollutant emissions that will result at Plant 18066 from the operation of S-5 and S-6:

**Table 1**

<b>Pollutant</b>	<b>Current plant emissions (TPY)</b>	<b>Increase in plant emissions associated with this application (TPY)</b>	<b>Cumulative emissions (Current + Increase) (TPY)</b>
NO <sub>x</sub>	0.012	0.153	0.165
POC	0.004	0.008	0.012
CO	0.002	0.100	0.102
PM <sub>10</sub>	0.002	0.006	0.008
SO <sub>2</sub>	0.000	0.011	0.011

**TOXIC RISK SCREENING ANALYSIS**

A Toxics Risk Screening Analysis was required for diesel engine exhaust from S-5 and S-6. A risk screening analysis was performed for estimated emissions from 50 hours of operation per year. The maximum cancer risk was found to be 53.21 in a million. In accordance with the District's Regulation 2, Rule 5, this risk level is not considered acceptable. Menlo Business Park, LLC has accepted an annual operating restriction of no more than 11 hours per year each for S-5 and S-6 for reliability-related testing in order to reduce the total risk for this project to acceptable levels.

**BACT**

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds per highest day of POC, NO<sub>x</sub>, CO, SO<sub>2</sub>, or PM<sub>10</sub>. Based on the above emission calculations, the owner/operator of S-5 and S-6 is subject to BACT for NO<sub>x</sub> and CO emissions. BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for this source category

The more restrictive BACT 1 levels do not apply for engines used exclusively for emergency use during involuntary loss of power per the BACT workbook, document 96.1.2 of the BAAQMD BACT Guidelines for IC engines. The engines will meet BACT 2 limits.

PSD, NSPS, NESHAPs do not apply to this application.

**OFFSETS**

Offsets are not required.

**STATEMENT OF COMPLIANCE**

S-3, S-5, and S-6 will be operated as emergency standby engines and therefore are not subject to the emission rate limits in Regulation 9, Rule 8 ("NO<sub>x</sub> and CO from Stationary Internal Combustion Engines"). S-3, S-5, and S-6 are subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO<sub>2</sub> limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9, Rule 1 is very likely since diesel fuel with a 0.015% by weight sulfur is mandated for use in California. Like all combustion sources, S-3, S-5, and S-6 are subject to Regulation 6 ("Particulate and Visible Emissions"). These engines are not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This application is considered to be ministerial under the District's 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 in accordance with Permit Handbook Chapter 2.3.

This facility is within 1,000 feet from the nearest school and therefore is subject to the public notification requirements of Regulation 2-1-412.

List of Schools:

Costano Elementary School  
2695 Fordham Street  
East Palo Alto, CA 94303  
(650) 329-2830

San Francisco 49ers Academy  
2695 Fordham Street  
East Palo Alto, CA 94303  
(650) 614-4300

Cesar Chavez Academy  
2450 Ralmar Avenue  
East Palo Alto, CA 94303  
(650) 329-6700

Green Oaks Elementary School  
2450 Ralmar Avenue  
East Palo Alto, CA 94303  
(650) 329-6536

Casa Dei Bambini Montessori School  
1215 OBrien Drive  
Menlo Park, CA 94025  
(650) 321-2773

Mid-Peninsula High School  
1340 Willow Rd  
Menlo Park, CA 94025  
(650) 321-1991

PSD, NSPS and NESHAPS are not triggered.

**PERMIT CONDITIONS**

**S-3**

COND# 22850 -----

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.  
[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/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: "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/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

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

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

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

**S-5 and S-6**

COND# 22811 -----

- 1. The owner/operator shall not exceed 11 hours per year per engine for reliability-related testing.

[Basis: "Regulation 2-5]

- 2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not

limited.

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

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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)]

End of Conditions

**RECOMMENDATION**

Issue Authority to Construct to Menlo Business Park, LLC for the following:

**S-3 Emergency Standby Diesel Generator, 2000 Caterpillar, Engine Model: 3306, 349 BHP**

**S-5 Emergency Standby Diesel Generator, 2009 Perkins, Engine Model: 2506D, 689 BHP**

**S-6 Emergency Standby Diesel Generator, 2006 Komatsu, Engine Model: SSA6D125E-5, 399 BHP**

By: \_\_\_\_\_  
Faye Bruno  
Air Quality Engineer II

Date: \_\_\_\_\_