

DRAFT

**ENGINEERING EVALUATION
TRINET CONSTRUCTION
PLANT NO. 16337
APPLICATION NO. 10552**

BACKGROUND

Trinet Construction is applying for an Authority to Construct and/or Permit to Operate for the following equipment:

S-1 Emergency Standby Generator Set: Diesel Engine; Make: International Truck and Engine Corporation; Model: GCA325; Rated Horsepower: 325 HP

The standby generator set will be used at 400 1st Ave., San Bruno, CA 94066.

EMISSIONS SUMMARY**Annual Emissions:**

The 325 HP diesel engine at S-1 is CARB Certified and the emission factors are listed below. For this report, it is assumed that the emission value of Total Unburned Hydrocarbons (HC) is equivalent to the emission value of POC.

Component	Emission (g/bhp-hr)
NO _x	3.76
CO	1.49
POC	0.20
PM ₁₀	0.104
SO ₂ *	0.184

**The emission factor for SO₂ is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

$$SO_2 \quad 8.09E-3 (\% S \text{ in fuel oil}) \text{ lb/hp-hr} = 8.09E-3 (0.05\% S) (454 \text{ g/lb}) = 0.184 \text{ g/hp-hr}$$

NO _x	=	3.76	g/bhp-hr *	325 hp *	50 hrs/yr *	lb/454 g =	134.581 lbs/yr =	0.06729 TPY
CO	=	1.49	g/bhp-hr *	325 hp *	50 hrs/yr *	lb/454 g =	53.331 lbs/yr =	0.02667 TPY
POC	=	0.2	g/bhp-hr *	325 hp *	50 hrs/yr *	lb/454 g =	7.159 lbs/yr =	0.00358 TPY
PM ₁₀	=	0.104	g/bhp-hr *	325 hp *	50 hrs/yr *	lb/454 g =	3.722 lbs/yr =	0.00186 TPY
SO ₂	=	0.184	g/bhp-hr *	325 hp *	50 hrs/yr *	lb/454 g =	6.586 lbs/yr =	0.00329 TPY

Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

$$\begin{aligned}
 \text{NO}_x &= 3.76 \text{ g/bhp-hr} * 325 \text{ hp} * 24 \text{ hrs/day} * \text{lb}/454 \text{ g} = 64.599 \text{ lbs/day} \\
 \text{CO} &= 1.49 \text{ g/bhp-hr} * 325 \text{ hp} * 24 \text{ hrs/day} * \text{lb}/454 \text{ g} = 25.599 \text{ lbs/day} \\
 \text{POC} &= 0.2 \text{ g/bhp-hr} * 325 \text{ hp} * 24 \text{ hrs/day} * \text{lb}/454 \text{ g} = 3.436 \text{ lbs/day} \\
 \text{PM}_{10} &= 0.104 \text{ g/bhp-hr} * 325 \text{ hp} * 24 \text{ hrs/day} * \text{lb}/454 \text{ g} = 1.787 \text{ lbs/day} \\
 \text{SO}_2 &= 0.184 \text{ g/bhp-hr} * 325 \text{ hp} * 24 \text{ hrs/day} * \text{lb}/454 \text{ g} = 3.161 \text{ lbs/day}
 \end{aligned}$$

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NO _x	0	0.0673	0.0673
CO	0	0.0267	0.0267
POC	0	0.0036	0.0036
PM ₁₀	0	0.0019	0.0019
SO ₂	0	0.0033	0.0033
NPOC	0	0.0000	0.0000

Toxic Risk Screening:

The toxic emission of diesel particulate exceeds the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis has been performed.

Table 1

Source:	PM ₁₀ Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year)	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.104	325	100	7.47	0.64	Yes

Results from the health risk screening analysis show that for 100 hours of operation per year when, excluding periods when operation is required due to emergency conditions, the maximum cancer risk is 1 in a million when the analysis was performed at a PM₁₀ emission 7.47 lb/year. In accordance with the District's Risk Management Policy, this risk level is considered acceptable.

STATEMENT OF COMPLIANCE

S-1 will be operated as emergency standby engines and therefore are not subject to the emission rate limits in Regulation 9, Rule 8 ("NO_x and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO₂ 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 9-1 is expected since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, S-1 is 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 they 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 proposed CEQA guidelines (Regulation 2-1-312) 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.

PUBLIC COMMENT

The project is within a thousand feet of a public school and therefore subject to the public notification requirements of Reg. 2-1-412. The public notice will be posted on the internet and mailed to all Parents or Guardians with children enrolled at Belle Air School. It will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

Best Available Control Technology:

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 or more per highest day of POC, NPOC, NO_x, CO, SO₂ or PM₁₀.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutants: NO_x and CO. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet BACT 2 limits presented below.

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
NOx	1. 1.5 g/bhp-hr [107 ppmvd @ 15% O ₂] ^{a,b} 2. 6.9 g/bhp-hr [490 ppmvd @ 15% O ₂] ^{a,b,c} 3. 6.9 g/bhp-hr [490 ppmvd @ 15% O ₂] ₂	1. Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler. ^{a,b} 2. Timing Retard $\leq 4^\circ$ + Turbocharger w/ Intercooler. ^{a,b,c} 3. Timing Retard $\leq 4^\circ$ + Turbocharger w/ Intercooler
CO	1. n/s 2. 2.75 g/bhp-hr [319 ppmvd @ 15% O ₂] _{b,c}	1. Catalytic Oxidation ^b 2. CARB or EPA (or equivalent) low-CO emitting certified engine _{b,c}

For NOx the emission limits set by BACT 2 are also met, as shown in Table (2) below.

Table (2)

Pollutant	Engine Emission Factors (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NOx	3.76	6.9	YES
CO	1.49	2.75	YES

Therefore, S-1 is determined to be in compliance with the BACT 2 limits for NOx and CO.

Since CARB certification data was used to establish the NOx and CO emission factors, the BACT 2 emission limits have not been incorporated into the permit conditions and are assumed to be complied with through the design standards demonstrated by the CARB certification testing.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 15 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Application 10552; Trinet Construction; Plant #16337; Conditions for S-1 Emergency Diesel Generator: (PC# 21909)

1. The owner/operator of emergency generator S-1 shall use only diesel fuel having a sulfur content no greater than 0.05% by weight. The sulfur content of the fuel oil shall be certified by the fuel oil vendor.
(Basis: Cumulative Increase)
2. The owner/operator of S-1 shall only operate this engine to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities

shall not exceed 50 hours in any calendar year. Operation while mitigating emergency conditions is unlimited.

(Basis: Regulation 9-8-330, Cumulative Increase, Toxic Risk Screening)

“Emergency Conditions” is defined as any of the following:

(Basis: Regulation 9-8-231)

- a. Loss of regular natural gas supply
- b. Failure of regular electric power supply
- c. Flood mitigation
- d. Sewage overflow mitigation
- e. Fire
- f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor

“Reliability-related activities” is defined as any of the following:

(Basis: Regulation 9-8-232)

- a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
- b. Operation of an emergency standby engine during maintenance of a primary motor

3. The owner/operator of S-1 shall provide this engine with either:

(Basis: Regulation 9-8-530)

- a. a non-resettable totalizing meter that measures and records the hours of operation for the engine
- b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

4. The owner/operator of S-1 shall maintain the following monthly records. These records shall be kept in a District-approved log for at least 2 years and shall be made available for District inspection upon request:

(Basis: Regulations 9-8-530, 1-441)

- a. Total hours of operation
- b. Hours of operation under emergency conditions and a description of the nature of each emergency condition
- c. Fuel usage.

RECOMMENDATION

Issue an Authority to Construct to Trinet Construction for the following source:

S-1 Emergency Standby Generator Set: Diesel Engine; Make: International Truck and Engine Corporation; Model: GCA325; Rated Horsepower: 325 HP

EXEMPTIONS

None.

By: _____ Date: _____
Henry Leung
Air Quality Engineering Intern