Bay Area Air Quality Management District

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Permit Evaluation
and
Statement of Basis
for
MINOR REVISION to the
MAJOR FACILITY REVIEW PERMIT

for

San Jose/Santa Clara
Water Pollution Control
Facility #A0778

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Application: 17638

Title V Statement of Basis

Minor Revision of Title V permit for San Jose/Santa Clara Water Pollution Control

This minor revision includes the addition of two new portable diesel engine sources (S-218 and S-219) approved under NSR application 17627 and a change to the description of S-16 to correctly reflect the source description. A copy of the evaluation report for the portable diesel engines (S-218 and S-219) is provided in the Appendix.

Changes to the Permit

Section II

- Changed description of source for S-16 to correct source description.
- Add S-218 and S-219 portable diesel engines to permitted sources table.

Section IV

- Changed description of source for S-16 to correct source description in Table IV-C.
- Add Table IV-M for S-218 and S-219.

Section VI

- Changed description of source for S-16 to correct source description in Condition # 17737.
- Add Condition # 24188 for S-218 and S-219.

Section VII

- Changed description of source for S-16 to correct source description in Table VII-C.
- Add Table VII-M for S-218 and S-219.

APPENDIX
ENGINEERING EVALUATION REPORT
San Jose/Santa Clara Water Pollution Control Plant, Plant No. 778
APPLICATION No. 17627

BACKGROUND

San Jose/Santa Clara Water Pollution Control Plant (SJSCWPCP) submitted an application to obtain an Authority to Construct and/or Permit to Operate for the following sources:

S-218 LWT BOOSTER Pump Portable Diesel Engine (City ID # 26701), John Deere, Model 6068HF-285, 200 HP
S-219 LWT BOOSTER Pump Portable Diesel Engine (City ID # 26702), John Deere, Model 6068HF-285, 200 HP

which will replace existing permitted engines (S-64 and S-65) which are used to pump sludge from the sludge lagoons to the drying beds. In addition, to provide emission offset credits, the facility will also shutdown S-8 generator.

EMISSIONS

Basis:
Annual emissions from S-218 and S-219 are based on each having prime usage of 1040 hours per year (8 hrs/day, 5 days/week, and 26 weeks/year). Worst-case daily emissions are based on 24 hours per day operation. However, the facility anticipates that typical operation to be 8 hours per day (maximum of 10 hours per day), 5 days per week, and 26 weeks per year. Emissions of NOx, CO, and PM will be calculated using emission factors provided by Executive Order U-R-004-0282. The SO2 emission factor is from mass balance, which is based on full conversion of fuel sulfur to SO2 and which will therefore be considered applicable to any diesel engine (sulfur content is based on B-20 biodiesel, which is used at the facility and is less than 15 ppm sulfur):

SO2 = 9.6 gals/hr (7 lb/gal)(15 x 10^{-6}) x 2 mole SO2/S = 0.002 lb/hr
NOx + NMHC = 3.6 g/kw-hr(0.742 kw/hp) = 2.7 g/bhp-hr
NMHC (5% of NOx + NMHC) = 0.13 g/bhp-hr
NOx (95% of NOx + NMHC) = 2.6 g/bhp-hr
CO = 1.3 g/kw-hr(0.742 kw/hp) = 1.0 g/bhp-hr
PM_{10} = 0.18 g/kw-hr(0.742 kw/hp) = 0.13 g/bhp-hr

For S-218 and S-219 (each)

Pollutant	Emission Factor (g/bhp-hr)	Maximum Annual Emissions (Cumulative Increase)[1] (TPY)	Maximum Daily Emissions per Engine[2] (lb/day)
NO_x	2.6	0.6	28
CO	1.0	0.23	11
PM_{10}	0.13	0.03	1
POC	0.13	0.03	1
SO2	0.002 lb/hr	0 (negligible)	0.05

[1] Emissions are determined by the following calculation:
lb/yr = (1040 hr/yr) (200 bhp) (Emission Factor [=] g/bhp-hr) (1 lb/453.6 g)(1 T/2000 lb)
[2] Maximum daily emissions based on 24 hours per day. Emissions are determined by the following calculation:
lb/day = (24 hr/day) (200 bhp) (Emission Factor [=] g/bhp-hr) (1lb/453.6 g)

Combined Emissions of S-218 and S-219

Pollutant	S-218 (TPY)	S-2 (TPY)	TOTAL (TPY)
NO_x	0.6	0.6	1.2
CO	0.23	0.23	0.5
PM_{10}	0.03	0.03	0.06
POC	0.03	0.03	0.06
SO2	0.00001	0.00001	0.00002

BACT

As per Regulation 2, Rule 2, Section 301, BACT is triggered for S-218 and S-219, because NOx and CO emissions are in excess of the 10-lb/highest day trigger level for BACT. Document number 96.1.2 of the District's BACT/TBACT Workbook gives BACT guidelines for the source category of IC Engines-Compression Ignition at or above 175 hp output rating.

The BACT guidelines per this section are as follows:

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC	1. *0.30 g/bhp-hr [62 ppmvd @ 15% O_2]* [a,b] 2. *1.5 g/bhp-hr [309 ppmvd @ 15% O_2]* [b,c]	1. *Catalytic Oxidation and CARB or EPA (or equivalent) low-total hydrocarbon emitting certified engine* [a,b] 2. *CARB or EPA (or equivalent) low-total hydrocarbon emitting certified engine* [b,c]
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]*	1. *Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler* [a,b] 2. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler* [a,b,c] 3. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler*
SO_2	1. *n/d* 2. *fuel oil < 0.05% sulfur* [a,b]	1. *n/d* 2. *Fuel Selection* [a,b]
CO	1. *n/s* 2. *2.75 g/bhp-hr [319 ppmvd @ 15% O2]* [b,c]	1. *Catalytic Oxidation* [b] 2. *CARB or EPA (or equivalent) low-CO emitting certified engine* [b,c]
PM_{10}	1. *n/d* 2. *If practical, gas-fueled engine or electric motor. If not, "California Diesel Fuel" (fuel oil w/ < 0.05% by weight sulfur and < 20% by volume aromatic hydrocarbons)* [b]	1. *Catalyst Guard Bed* [a,b] 2. *Fuel Selection* [b,d]

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
	3. *0.1 grams/bhp-hr*	3. *CARB or EPA (or equivalent) low-particulate matter emitting certified engine, or particulate*

a. CARB/CAPCOA Clearinghouse

b. *BAAQMD NOTE: IC Engine BACT and TBACT is a low emitting, spark-ignited, gas-fueled engine with lean burn combustion or rich burn with non-selective catalytic reduction, or electric motor. A diesel engine will be permitted only if a gas-fueled engine, or electric motor, is not practical (e.g., a remote location without natural gas availability or electric power, or only a diesel engine will meet the portability and/or power/torque/rpm requirements of the application under review, or the engine is used exclusively for emergency use during involuntary loss of power).*

c. Timing retard, etc. controls alone may be acceptable only in very limited situations for temporary sources.

Gas-fueled engines or electric motors are not practical and only a diesel engine will meet the portability and power requirements that are needed to pump solids from the lagoons to the drying beds. There are 28 lagoons, each 1200 feet by 300 feet, and there are 15 hydrants for connections to the booster pumps. There are no gas pipelines or electric lines in the lagoon area. To serve the area with gas or electricity would require installation of more than 15,000 feet of 4160-volt electric lines or gas pipelines, which is not practical. In addition, there are no propane-fired engines, which are certified for use to power a 200 hp-portable pump. Deutz and John Deere do not make propane-fired engines. Cummins and General Motors does not a certified propane engine for portable use in the 200 hp-size. Hence, use of diesel engines for this prime use is acceptable.

BACT (1) for NOx is typically achieved using a selective catalytic reduction (SCR) system with timing retard and a turbocharger with an intercooler. There is no certified SCR system available for the proposed engines to reduce NOx emissions. It is not technically feasible to add a SCR system to these portable engines because the engines are moved about the facility as needed to pump sludge. Typically, SCR units are bulky and should be left stationary due to its weight and size. As a result, BACT2 applies.

BACT(2) limits NO_x emissions to 6.9 g/bhp-hr. The certified data indicates that the NO_x emissions from S-218 and S-219 are less than 2.7 g/bhp-hr. Therefore, S-218 and S-219 meet the BACT(2) limits for NOx emissions. Similarly, for CO emissions (1.0 g/bhp-hr) will also meet the BACT2 requirements (2.75 g/bhp-hr) will be met. As a result, the sources (S-218 and S-219) meet BACT2 requirements.

OFFSETS

Because SJSCWPCP is a major facility, offsets are required any existing cumulative and for application increase for NOx and POCs, per Regulation 2-2-302. There is no current pre-existing cumulative increase for this facility for either NOx or POC. Hence, the only offsets required are those from this application.

The application increase resulting from this application is the following:

NOx Increase = 1.2 TPY
POC Increase = 0.06 TPY

SJSCWPCP will shutdown S-64, S-65, and S-8 upon the startup of S-218 and S-219. Per Regulation 2-2-605, the baseline period is September 11, 2005 through September 10, 2008 (date of receipt of S-8 logs via fax).

In reviewing the operation log of S-64 and S-65, source S-64 ran a total of 307 hours and S-65 ran a total of 1094 hours over the baseline period. The hourly logs were taken by facility staff.

Emission data (for Cummin's NT engines, configuaration D091327FX02, ESN 30125637, CPL 413, rated 235 HP) was obtained from Cummins, the manufacturer of S-64 and S-65. The emissions data from Cummins indicated the following emission factors:

NOx = 7.5 g/bhp-hr
POC = 0.16 g/bhp-hr

However, the ATCM for portable diesel engines requires the following Tier 1 limits in 2010 for these "in-use" engines:

NOx = 6.9 g/hhp-hr
POC = 1 g/bhp-hr

As a result, to RACT-adjust the emissions, the lower emission factor for NOx from the ATCM shall be used with the Cummins provided POC emission factor. Based on the emission data and the number of hours of operation during the baseline period, the following contemporaneous reductions were calculated for the shutdown of S-64 and S-65:

NOx Emissions Credit = (307 + 1094 hours/3 yr)(6.9 g/bhp-hr)(235 hp)(lb/453.6 g)(ton/2000 lb)
NOx Emissions Credit = 0.8 TPY

POC Emissions Credit = (307 + 1094 hours /3 yr)(0.16 g/bhp-hr)(235 hp)(lb/453.6 g)(ton/2000 lb)
POC Emissions Credit = 0.02 TPY

Recordkeeping logs for S-8 for the baseline period between 2005 and 2008 were provided by the facility and accounted for 2,117 hours over the baseline period. The logs were taken by facility staff.

2005 Source test data for S-8 was used to estimate the resulting NOx emission reduction credits. The source test indicated that the level of POCs was below the detection level. In accordance with District practice, we have taken half the detection level as the emission factor for emission reduction calculations.

Based on the emission data and the number of hours of operation during the baseline period, the following contemporaneous reductions were calculated for the shutdown of S-8:

NOx Emissions Credit = (2,117 hours/3 yr)(day/24 hr)(47.5 lb/day)(ton/2000 lb)
NOx Emissions Credit = 0.70 TPY

POC Emissions Credit = (2,117 hours/3 yr)(day/24 hr)(3.8 lb/day)(ton/2000 lb)
POC Emissions Credit = 0.05 TPY

CO Emission Credit = (2,117 hours/3 yr)(day/24 hr)(254lb/day)(ton/2000 lb)
CO Emission Credit = 3.7 TPY

SO2 Emission Credit = (2,117 hours/3 yr)(day/24 hr)(11.1 lb/day)(ton/2000 lb)
SO2 Emission Credit = 0.2 TPY

There is no RACT-adjustment for S-8 credits because the source tested emissions are below Regulation 9-8 requirements for gas-fired engines now and for those applicable in 2012 (Regulation 9-8-304). From these contemporaneous reductions, POC and NOx emissions were fully offset with NOx credits remaining. As a result, the following remaining credits should be issued to the facility as emission reduction credits:

POC = 0.06 TPY – 0.02 TPY – 0.05 = 0 (fully offset)
NOx = 1.2 TPY – 0.8 TPY – 0.70 TPY = (0.3 TPY) returned as credit
CO = 0.5 - 3.7 TPY = (3.2 TPY) returned as credit
SO2 = 0 - 0.2 TPY = (0.2 TPY) returned as credit

TOXIC RISK SCREEN ANALYSIS

Per the April 8, 2008 Risk Screening Assessment from the District's Toxics Evaluation Section, a risk screening analysis was performed on this application. The cancer risk is calculated based on the emission rate of diesel exhaust particulate matter. Diesel exhaust particulate matter is used as a surrogate for all toxic contaminants found in diesel exhaust. The District's Regulation 2, Rule 5 requires that the cumulative impacts from all related projects be evaluated in the risk screen.

For 1040 hours of operation per year for each engine (S-218 and S-219), the maximum cancer risk was calculated to be 0.5 chances in a million for resident and 8.2 chances in a million for an off-site worker. This level of risk is acceptable under District's Regulation 2, Rule 5, because the engines meet the TBACT and ATCM.

STATEMENT OF COMPLIANCE

S-218 and S-219 portable engines are subject to the Ringelmann No. 2 limitations of Regulation 6-1-303 (emissions opacity limitations). Per Regulation 6, Rule 1, Section 303, 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. Properly operated and maintained diesel engines are expected to meet this requirement.

S-218 and S-219 are also subject to the SO_2 limitations of Regulation 9-1-302 (ground level concentration) and 9-1-304 (0.5% by weight in fuel). Per Regulation 9, Rule 1, Section 302, a person shall not emit from any source a gas stream containing sulfur dioxide in excess of 300 ppm (dry). Additionally, per Regulation 9, Rule 1, Section 304, a person shall not burn any liquid fuel having sulfur content in excess of 0.5% by weight. Compliance with both Regulations 9-1-302 and 9-1-304 is likely since California law mandates using diesel fuel with a 0.05% by weight sulfur.

The proposed portable engines (S-218 and S-219) will be subject to emission standards of Regulation 9-8 starting in January 1, 2012. In addition, the proposed engines (S-218 and S-219) are subject to Tier 3 standards per the ATCM for new portable engines. The proposed engines (S-218 and S219) will meet the Tier 3 standards:

Tier 3 Standards:	Proposed Engines (S-218 & S-219)
POC = 3.0 g/bhp-hr	POC = 0.13 g/bhp-hr
NOx = 2.6 g/bhp-hr	NOx = 2.6 g/bhp-hr
PM10 = 0.15 g/bhp-hr	PM10 = 0.13 g/bhp-hr

This application is considered to be ministerial under the District's CEQA guidelines (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.

Pursuant to the results of the Toxic Risk Screening Analysis, S-218 and S-219 shall be limited to 1040 hours per year of operation.

PSD, NSPS, and NESHAPS are not triggered.

The facility is not located within 1000 feet of any school. As a result, school public notice is not triggered.

PERMIT CONDITIONS

I recommend that each of the engines (S-218 and S-219) be subject to the following permit conditions:

1. The owner/operator shall not exceed 1,040 hours per year per engine. [Basis: Cumulative Increase, Toxics Risk Screening]

2. The owner/operator shall operate each 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: Cumulative Increase, Toxics Risk Screening]

3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 60 months from the date of entry. 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.
   b. Fuel usage for each engine.

   [Basis: Cumulative Increase, Toxics Risk Screening, Regulation 2-6-501]

RECOMMENDATION

Authority to Construct be waived and Permit to Operate be issued to SJSCWPCP for the following:

S-218 LWT BOOSTER Pump Portable Diesel Engine (City ID # 26701), John Deere, Model 6068HF-285, 200 HP
S-219 LWT BOOSTER Pump Portable Diesel Engine (City ID # 26702), John Deere, Model 6068HF-285, 200 HP

Archive the permits for the following sources:

S-8 Stationary Engines
S-64 IC Engine
S-65 IC Engine

Issue Banking Certificate to SJSCWPCP for the following:

NOx 0.3 TPY
CO: 3.2 TPY
SO2: 0.2 TPY

BY: [signed by M.K. Carol Lee] 11/05/2008
M.K. Carol Lee, Senior AQ Engineer Date