SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	PAGES	PAGE 1
STATIONARY SOURCE COMPLIANCE DIVISION	APPL NO See Below	DATE 8/10/10
PERMIT APPLICATION PROCESSING AND CALCULATIONS	PROCESSED BY TK	CHECKED BY AD

Applicant

LA County Sanitation Districts
P.O.Box 4998
Whittier, CA 90607

Equipment Location

Puente Hills Landfill
2800 Workman Mill Road
Whittier, CA

Equipment Description

A/N 501721 (Previous A/N 394362)

LANDFILL GAS TO ENERGY SYSTEM NO. 1 CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE NO. 1, CATERPILLAR, MODEL G3616, SIXTEEN CYLINDER, 4261 BHP, LEAN BURN, LANDFILL GAS/NATURAL GAS FIRED, TURBOCHARGED AND AFTERCOOLED, DRIVING A 3MW ELECTRICAL GENERATOR.

2. COMPRESSOR, 1,468 CFM, 300 HP.

3. ANCILLARY RADIATOR AND AFTERCOOLER WITH ELECTRIC FANS.

4. ANCILLARY MUFFLER AND EXHAUST STACK.

A/N 501722 (Previous A/N 394363)

LANDFILL GAS TO ENERGY SYSTEM NO. 2 CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE NO. 2, CATERPILLAR, MODEL G3616, SIXTEEN CYLINDER, 4261 BHP, LEAN BURN, LANDFILL GAS/NATURAL GAS FIRED, TURBOCHARGED AND AFTERCOOLED, DRIVING A 3MW ELECTRICAL GENERATOR.

2. COMPRESSOR, 1,468 CFM, 300 HP.

3. ANCILLARY RADIATOR AND AFTERCOOLER WITH ELECTRIC FANS.

4. ANCILLARY MUFFLER AND EXHAUST STACK.

A/N 501723 (Previous A/N 394364)

LANDFILL GAS TO ENERGY SYSTEM NO. 3 CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE NO. 3, CATERPILLAR, MODEL G3616, SIXTEEN CYLINDER, 4261 BHP, LEAN BURN, LANDFILL GAS/NATURAL GAS FIRED, TURBOCHARGED AND AFTERCOOLED, DRIVING A 3MW ELECTRICAL GENERATOR.

2. COMPRESSOR, 1,468 CFM, 300 HP.

3. ANCILLARY RADIATOR AND AFTERCOOLER WITH ELECTRIC FANS.

4. ANCILLARY MUFFLER AND EXHAUST STACK.

History

The Puente Hills landfill is an operating Class III landfill. The gas generated by the landfill is presently collected and flared or used to produce electricity by driving electric generators with landfill gas fired engines. These applications were submitted to change Condition No. 11 and 12 to allow the use of natural gas in the pre-combustion chamber. The pre-combustion chamber is used to ignite the main combustion chamber. Fluctuating BTU content of the landfill gas results in unstable firing in the pre-combustion chamber. When the pre-combustion chamber misfires, the main combustion chamber fails to ignite. This affects the safety of the operation and impacts emissions. There will be no increase in the usage of natural gas from the previous permit allowance of 25% of the total engine heat input on an average daily basis.

Previous A/N's 486508, 486509 and 486511 requested that the ECF (Efficiency Correction Factor) for NOX and ROG limits in accordance with Rule 1110.2. Condition No. 20 will be changed to show the revised limits as were verified by the source tests. These changes will be combined into this evaluation and the A/N's 486508, 486509 and 486511 will be cancelled. In addition condition No. 10 will be revised to allow for the usage of 10% natural gas on a monthly basis.

Process Description

The landfill gas, which is collected at this facility, is used to fuel three internal combustion engines and drive electrical generators in the production of electricity. The landfill gas, which is collected by the existing collection system, is diverted to the internal combustion engines. The engines in turn drive the electrical generators to produce electricity. The engines operate in lieu of the existing flares. As the landfill gas generation rate decreases and there is insufficient landfill gas to make the project viable to operate, the landfill gas to energy systems will be removed.

Calculations

There is no emission increase from this change of conditions.
Emissions from each engine as previously calculated.

ROG = 4,261 bhp x 0.18 gr/bhp-hr x lb/454 gr
= 1.69 lbs/hr
= 40.6 lbs/day

NOx = 4,261 bhp x 0.51 gr/bhp-hr x lb/454 gr
= 4.79 lbs/hr
= 115 lbs/day

SOx = 4,261 bhp x 0.20 gr/bhp-hr x lb/454 gr
= 1.86 lbs/hr
= 44.6 lbs/day

CO = 4,261 bhp x 2.5 gr/bhp-hr x lb/454 gr
= 23.5 lbs/hr
= 564 lbs/day

PM10 = 4,261 bhp x 0.17 gr/bhp-hr x lb/454 gr
= 1.58 lb/hr
= 38 lb/day

Evaluation

Rule 212: There is no school within 1000 feet, no emission increase and no increase in toxic risk. Therefore a public notice is not required.

Rule 401: Visible emissions are not expected.

Rule 402: Nuisance is not expected.

Rule 404: Compliance is expected.

Rule 431.1 Equipment has met the 150 ppmv H2S limit. Facility uses a continuous sulfur fuel gas meter.

Rule 1110.2: Source test dated 9/12/07 showed equipment in compliance with emission limits.
The following source tests were performed to verify ECF (Efficiency Correction Factor) and emission limits:
Engine No. 1 (S/T 11/17/09)
ECF = 9250/6226 = 1.49
NOx = 36 ppm x 1.49 = 54 ppm @15% O2
ROG = 40 ppm x 1.49 = 60 ppm @15% O2

Engine No. 2 (S/T 9/30/08)
ECF = 9250/6724 = 1.38
NOx = 36 ppm x 1.38 = 50 ppm @15% O2
ROG = 40 ppm x 1.38 = 55 ppm @15% O2

Engine No. 3 (S/T 12/3/09)
ECF = 9250/6273 = 1.47
NOx = 36 ppm x 1.47 = 53 ppm @15% O2
ROG = 40 ppm x 1.47 = 59 ppm @15% O2

Rule 1150.1: Equipment has met the NMOC outlet concentration of 20 ppm (dry, as hexane @ 3% O2) or 98% destruction efficiency.

Reg XIII: There is no emission increase from the change of conditions. Equipment is in compliance.

Modeling:
Previous detailed modeling was performed and showed compliance with AQMD rules and regulations. NOx was below California and Federal standards. See memo from Mike Nazemi and Fred Lettice dated 4/12/02.

Rule 1401: Toxic Risk Assessment:

Previous toxic risk had been evaluated and the results showed 0.249 in a million (0.083 in a million per engine). See memo from Mike Nazemi and Fred Lettice dated 4/12/02. Equipment is in compliance.

Reg XXX: A Title V permit was issued to this facility in November 2006. This is a Minor permit revision. No Public Notification is required. A 45 day EPA review is required. Compliance is expected.

Conclusions and Recommendations

This project is expected to comply with all applicable AQMD rules and regulations. Recommend issuing a permit to construct/operate.