

**ENGINEERING EVALUATION for Public Notice for Schools
EAST SIDE UNIFIED HIGH SCHOOL DISTRICT
PLANT 15076
APPLICATION 6683**

BACKGROUND

East Side Unified High School District has applied for a permit for two Tecogen CM-75 gensets (S-1 and S-2) each with a natural gas-fueled spark-ignited engine used to power a generator. The 108 horsepower engine in each genset is a TecoDrive 7400 derived from a General Motors 454 cubic inch engine (with a rich-burn 4-cycle and natural aspiration). A Johnson Matthey 3-way catalyst is added to abate the engine exhaust emissions. The applicant has requested that each genset be allowed to operate 8,760 hours per year (i.e., continuous operation).

EMISSIONS

The gensets permitted under this application are considered new sources. Consequently, there is a cumulative emission increase associated with this permit application. The applicant has elected to add a Johnson Matthey 3-way catalyst to each genset engine so that emissions of NO_x, CO, and HC are each emitted into the atmosphere at a rate that does not trigger Best Available Control Technology (BACT). Although the applicant has indicated that the NO_x, CO, and HC emissions will be 0.15, 0.60 and 0.15 g/bhp-hr, respectively, the proposed emission limits are 1.60 g/bhp-hr for each. With this emission rate, operation at full load (108 hp), and continuous operation, NO_x, CO and HC emissions from each genset into the atmosphere could be 9.1 pounds per day and 3,337 pounds per year (1.669 tpy). Hence, the higher emission factor is approvable since BACT is not triggered.

Emissions of sulfur dioxide and PM₁₀ are calculated using the maximum natural gas firing rate times the energy content of natural gas (1020 Btu/cubic foot) times 8,760 hours per year operation times the SO₂ and PM₁₀ emission factors from Table 3.2-3 of Chapter 3.2, Natural Gas-fired Reciprocating Engines, of Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources. The emission factor for PM₁₀ is the addition of the PM₁₀ filterable plus PM₁₀ condensable. (This US EPA publication is commonly referred to as "AP-42" and it can be viewed online at <http://www.epa.gov/ttn/chief/ap42/index.html>.) Emissions for SO₂ and PM₁₀ are calculated using an Excel spreadsheet that is attached to show the results.

The cumulative increase is summarized below:

NOX = 3283 lb/yr = 1.642 tpy
CO = 3283 lb/yr = 1.642 tpy
HC = 3283 lb/yr = 1.642 tpy
PM10 = 132 lb/yr = 0.066 tpy
SO2 = 4 lb/yr = 0.002 tpy

TOXIC RISK SCREENING ANALYSIS

S-1 is subject to the District Risk Management Policy. Emissions of toxic air contaminants (TACs) are calculated using emission factors from a California Air Toxic Emission Factor II Database (CATEF) search and from Table 3.2-3 in AP-42. Benzene and formaldehyde emissions are preferentially calculated using CATEF emission factors for a controlled engine. These were the only TAC emission factors for a controlled engine. Since the engine has a 3-way catalyst, I have reduced the other TAC emissions by 80%. Using our standard protocol, I have assumed that the compounds with a "less than" emission factor are emitted at 50% of the "less than" emission factor. The CATEF website recommends not using the acrolein emission factor since the sampling method is "in doubt." Since Table 3.2-3 in AP-42 also references CATEF data, emissions of acrolein are ignored. CATEF data was generated in California using sampling methods approved by the State. Hence, CATEF emission factors for uncontrolled engines are preferentially used over AP-42 emission factors for the same compounds. AP-42 emission factors are used for compounds not included in the CATEF database. Although AP-42 reports total PAHs, it fails to give any indication as to what individual species are represented. Using guidance from "PAH Emissions," an email Brian Bateman posted to the Permit Bulletin Board on April 25, 2002, I therefore preferentially used the CATEF emission factors for speciated PAHs.

Emissions of TACs are calculated using the Excel spreadsheet mentioned above and shown on the attached spreadsheet.

Using the guidance emission factor selection discussed above, the calculated annual emission for each TAC is below its toxic trigger. In accordance with the District Risk Management Policy, the proposed project complies with the Risk Management Policy and no further risk analysis is required.

STATEMENT OF COMPLIANCE

Engines under 250 brake horsepower are not subject to NOx and CO standards in Regulation 9, Rule 8. S-1 and S-2 are

subject to the SO₂ limitations of 9-1-301 (ground-level concentration) and 9-1-302 (300 ppm_{dv} in exhaust). Compliance with both of these requirements is very likely since the applicant will use utility-supplied natural gas. Like all sources, S-1 and S-2 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.

The project is considered to be ministerial under the District's CEQA Regulation 2-1-311 because it is evaluated in accordance with Chapter 2.3 of the Permit Handbook 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.

The project is less than 1000 feet from the nearest school (since it is on the school site) and is therefore subject to the public notification requirements of Regulation 2-1-412. A public notice was prepared for this application and distributed by the school to the parents and guardians of the students and mailed by the District to all addresses within 1,000 feet of the gensets.

A paragraph will be added after the comment period expires to discuss comments and responses to the public notice.

As discussed above, S-1 complies with the District Risk Management Policy.

Prevention of Significant Deterioration (PSD), Standards Of Performance For New Stationary Sources (NSPS) (40 CFR Parts 60) and National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Parts 61) are not applicable to this source.

BACT and Offsets

BACT does not apply since emissions will be indirectly conditioned to not exceed 9.14 pounds per day. Total facility emissions, which only include this project, will be less than 15 tons per year of POC and NO_x. Therefore, offsets are not required per Offset Requirements (2-2-302).

PERMIT CONDITIONS

For: S-1 Cogeneration Unit, 75 kW, Tecogen CM-75 w/TecoDrive 7400 engine, 108 HP, abated by A-1, 3-Way Catalyst, Johnson Matthey Bandito CX6-4

S-2 Cogeneration Unit, 75 kW, Tecogen CM-75 w/TecoDrive 7400 engine, 108 HP, abated by A-2, 3-Way Catalyst, Johnson Matthey Bandito CX6-4

1. The owner/operator shall fire each source exclusively with natural gas. (Basis: cumulative increase)
2. The owner/operate shall not operate either engine unless NOx, CO and POC emissions are abated by the 3-Way Catalyst system. (Basis: cumulative increase, TBACT)
3. The owner/operator shall not operate either engine such that emissions exceed any of the following limits:
 - a. NOx as nitrogen dioxide: 1.60 gr/hp-hr (approximately 350 ppm at actual exhaust conditions, full load);
 - b. CO: 1.60 gr/hp-hr (approximately 570 ppm at actual exhaust conditions, full load);
 - c. POC: 1.60 gr/hp-hr(Basis: cumulative increase, BACT)
4. To demonstrate compliance with Condition 3, the owner/operator shall measure the NOx and CO concentration from each engine, according to the following schedule:
 - a. within 30 days of startup of each engine;
 - b. at least once per consecutive 12-month period, following startup.

Measurements may be made using a District-approved source test, or using hand-held portable NOx and CO monitors. Hand-held monitors shall be operated, maintained and calibrated in accordance with manufacturer guidelines. (Basis: cumulative increase)

5. The owner/operator shall keep the following records, for a period of at least 2 years following the date on which the record was made, and shall make these records available to the District upon request.
 - a. NOx and CO concentration measurements taken per Condition 4.
 - b. Any source tests.(Basis: cumulative increase, BACT)

RECOMMENDATION

Issue Authority to Construct to East Side Unified High School District for:

For: S-1 Cogeneration Unit, 75 kW, Tecogen CM-75 w/TecoDrive 7400 engine, 108 HP, abated by A-1, 3-Way Catalyst, Johnson Matthey Bandito CX6-4

S-2 Cogeneration Unit, 75 kW, Tecogen CM-75 w/TecoDrive 7400 engine, 108 HP, abated by A-2, 3-Way Catalyst, Johnson Matthey Bandito CX6-4

By:

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