

ALLEGHENY COUNTY HEALTH DEPARTMENT AIR QUALITY PROGRAM

December 28, 2011

SUBJECT: **Moorhead Federal Building**
1000 Liberty Avenue
Pittsburgh, PA 15222
Allegheny County

Synthetic Minor Source Operating Permit No. 0829

TO: Sandra L. Etzel
Chief Engineer

FROM: David D. Good
Air Quality Engineer

FACILITY DESCRIPTION

Moorhead Federal Building is used by the United States General Services Administration to conduct their day to day operations. The building contains a 1,545 kW emergency power generator to use in instances of interruption to their main power supply to the building.

This facility is a synthetic minor source of nitrogen oxides (NO_x), and a minor source of particulate matter (PM), particulate matter <10 µm in diameter (PM₁₀), particulate matter <2.5 µm in diameter (PM_{2.5}), sulfur dioxide (SO₂), carbon monoxide (CO), and volatile organic compounds (VOCs) as defined in §2101.20 of Article XXI.

PERMIT APPLICATION COMPONENTS:

1. Operating Permit Application No. 0829, dated March 10, 2011

EMISSION SOURCES:

Generator & Tanks

I.D.	Source Description	Control Device(s)	Maximum Capacity	Fuel / Material	Stack I.D.
P001	Emergency Generator Caterpillar 3512BDITA	turbocharger, aftercooler, electronic fuel injection	1,545 kW	No. 2 Fuel Oil	S001
D001	Diesel Fuel Storage Tank (underground)	none	2,000 gal	No. 2 Fuel Oil	--
D002	Diesel Fuel Storage Tank (aboveground)	none	150 gal	No. 2 Fuel Oil	--

METHOD OF DEMONSTRATING COMPLIANCE:

Compliance with the emission standards set in this permit will be demonstrated by maintaining records of generator operation and fuel use as well as supplier certification of sulfur content. See Operating Permit No. 0829 for the specific conditions for determining compliance with the applicable requirements.

REGULATORY APPLICABILITY:

1. Article XXI Requirements for Issuance:

See Permit Application No. 0829, Section 5: Applicable Requirements. The requirements of Article XXI, Parts B and C for the issuance of minor source operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

§2103.12.a.2.B (Standards for Issuance): Existing sources, where no limits have been established under Article XXI, are subject to Reasonably Available Control Technology (RACT) requirements.

a. The Department has determined that RACT shall be:

- The use of ultra low sulfur fuel oil with 15 ppm sulfur content, low usage option and good combustion practice.

2. Testing Requirements:

Testing is not required. However, the Department reserves the right to require additional testing if necessary in the future to assure compliance with the terms and conditions of Operating Permit No. 0829.

3. New Source Performance Standards (NSPS):

The facility is not subject to 40 CFR Part 60, Subpart III – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. The generator was installed in 2004, before the applicability date of the NSPS.

4. NESHAP and MACT Standards:

The facility is not subject to any NESHAP or MACT standards. 40 CFR Part 63, Subpart ZZZZ does not apply to this facility based on §63.6590(b)(3) which states: "...or an existing stationary residential, commercial, or institutional emergency stationary RICE located at an area source of HAP emissions, does not have to meet the requirements of this subpart and of subpart A of this part."

5. Risk Management Plan; CAA Section 112(r):

No materials stored at the facility meet the threshold for CAA §112(r). Therefore, the facility is not subject to CAA §112(r).

EMISSIONS CALCULATIONS:

Emergency Generator

Generator Rating:	1,545 kW (2,172 hp)
Fuel Use:	106.0 gal/hr
No. of Generators:	1 (one)
Fuel Oil Sulfur Limit:	0.0015%
Operation:	500 hrs/yr

Emissions are based on data supplied by the manufacturer (see permit application #0829). Because particulate matter and sulfur oxide emissions based on manufacturer information are less than the limit in Article XXI, §2104.02(a)(1)(B) and §2104.03(a)(2)(A), the Article XXI limits have been streamlined into the manufacturer's limits. All PM is assumed to be PM₁₀, and all PM₁₀ is assumed to be PM_{2.5}.

Article XXI: $0.28 \text{ lb}_{\text{PM}}/\text{MMBtu} \times 71.35 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 2.60 \text{ lb}_{\text{PM}}/\text{hr}$
 $1.0 \text{ lb}_{\text{SO}_x}/\text{MMBtu} \times 71.35 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 9.27 \text{ lb}_{\text{SO}_x}/\text{hr}$

Emissions are based on data supplied by the manufacturer (see permit application #0829). All PM is assumed to be PM₁₀, and all PM₁₀ is assumed to be PM_{2.5}.

NO_x: $8.76 \text{ g/hp-hr} \times 2,172 \text{ hp} \div 453.6 \text{ g/lb} = \mathbf{41.92 \text{ lb/hr}}$
 VOC: $0.21 \text{ g/hp-hr} \times 2,172 \text{ hp} \div 453.6 \text{ g/lb} = \mathbf{1.01 \text{ lb/hr}}$
 CO: $0.55 \text{ g/hp-hr} \times 2,172 \text{ hp} \div 453.6 \text{ g/lb} = \mathbf{2.63 \text{ lb/hr}}$
 PM-10: $0.11 \text{ g/hp-hr} \times 2,172 \text{ hp} \div 453.6 \text{ g/lb} = \mathbf{0.51 \text{ lb/hr}}$

The manufacturer supplied the following equation for sulfur emissions when combusting ultra low-sulfur diesel:

$\text{SO}_2 \text{ g/hr} = 0.01998 \times \text{fuel rate (g/hr)} \times \text{S\%}$
 $0.01998 \times 106.0 \text{ gal/hr} \times 3.79 \text{ L/gal} \times 838.9 \text{ g/L} \times 0.0015 \div 453.6 \text{ g/lb} = \mathbf{0.022 \text{ lb/hr SO}_x}$

From the manufacturer specifications, the maximum brake horsepower is 2,172 bhp.

Emergency Generator Emission Limits

Pollutant	Short-Term Emissions (lb/hr)	Long-Term Emissions [500 hours/year] (tons/year)
Particulate Matter	0.51	0.13
PM ₁₀	0.51	0.13
PM _{2.5}	0.51	0.13
Nitrogen Oxides	41.92	10.48
Sulfur Oxides	0.022	0.01
Carbon Monoxide	2.63	0.66
Volatile Organic Compounds	1.01	0.25

Diesel Fuel Storage Tank

VOC emissions from the diesel fuel storage tank are negligible (< 0.0005 tpy) using Tanks 4.0.9D.

RECOMMENDATION:

All applicable Federal, State, and County regulations have been addressed in the permit application and the facility was found to be in compliance. The Operating Permit for Moorhead Federal Building should be approved with the emission limitations and terms & conditions in Operating Permit No. 0829.