

June 1, 2009

Mr. Ted Webster
Alternate Designated Representative
Genesee Power Station
G-5310 North Dort Highway
Flint, Michigan 48505

Re: Petition to Use a Default SO₂ Emission Rate for Unit 01 at the Genesee Power Station
(Facility ID (ORISPL) 54751)

Dear Mr. Webster:

The United States Environmental Protection Agency (EPA) has reviewed the July 18, 2007 petition submitted under §75.66 by Genesee Power Station (Genesee), in which Genesee requested to use a default emission rate to report hourly sulfur dioxide (SO₂) mass emissions for Genesee Unit 01. EPA approves the petition in part, with conditions, as discussed below.

Background

Unit 01 at the Genesee Power Station in Genesee County, Michigan, is a 35 MW, wood-fired stoker boiler at an independent power plant. The unit burns primarily waste wood and uses natural gas for start-ups and to maintain load when necessary. According to Genesee, Unit 01 is subject to the Clean Air Interstate Rule (CAIR) annual and ozone season programs. Therefore, for this unit, Genesee is required to continuously monitor and report nitrogen oxides (NO_x) mass emissions and heat input by January 1, 2008 and to monitor and report SO₂ mass emissions by January 1, 2009, in accordance with 40 CFR Part 75.

In the July 18, 2007 petition, Genesee states that SO₂ emissions from Unit 01 are about 1.05 tons annually and that the sulfur content of the wood fired in Unit 01 is less than 0.05% by weight (based on fuel analyses submitted with the petition). Supplementary information provided by Genesee on October 10, 2008 indicates that the natural gas combusted in Unit 01 is required to have no more than 5.0 grains of total sulfur per 100 standard cubic feet. According to Genesee, both the wood and natural gas combusted in the unit meet the definition of “very low sulfur fuel” in 40 CFR 72.2.

Before certain revisions to Part 75 became effective on January 24, 2008, §75.11(f) required the owner or operator of a solid fuel-fired unit such as Genesee Unit 01 to install, certify and operate a continuous emission monitoring system (CEMS) for SO₂. However, the July 18, 2007 petition states that in the early 1990s an SO₂ monitor was installed on Unit 01 and that, due to the extremely low levels of SO₂ in the stack, it was not possible to meet the data accuracy

requirements.

Section 75.11(e)(3)(iii) requires hourly average SO₂ concentrations recorded by a CEMS to be adjusted upward to a default value of 2 ppm for every hour in which very low sulfur fuel is combusted and the CEMS records an hourly average SO₂ concentration less than 2 ppm. It is entirely possible that using a CEMS to measure the very low SO₂ concentrations at Genesee Unit 01 would result in the 2 ppm default value being reported for the vast majority of the unit's operating hours. Therefore, in the July 18, 2007 petition, Genesee proposed to quantify Unit 01's SO₂ emissions using Equation F-23 in Appendix F to Part 75, in lieu of using an SO₂ CEMS.

Equation F-23 uses a default SO₂ emission rate (lb/mmBtu), together with heat input rates measured by certified flow rate and diluent gas (CO₂ or O₂) monitors, to determine hourly SO₂ mass emission rates. In the July 18, 2007 petition, Genesee (incorrectly) proposed to use a default SO₂ concentration of 2 ppm, rather than an SO₂ emission rate, in Equation F-23, but subsequently corrected this error (on October 10, 2008) and requested to use a default SO₂ emission rate of 0.0006 lb/mmBtu, instead.

At the time of Genesee's petition, the use of Equation F-23 was restricted to units with certified SO₂ monitors and was further limited to hours in which only gaseous fuel is being combusted in the affected unit. However, on January 24, 2008, §75.11(f) and section 7 of Appendix F to Part 75 were amended to allow the owner or operator of a unit that combusts very low sulfur fuel, regardless of the state of matter (i.e., solid, liquid, or gas), to petition the Administrator for approval to use a site-specific default SO₂ emission rate and for permission to use Equation F-23 to quantify SO₂ mass emissions (see 73 FR 4315, January 24, 2008).

EPA's Determination

Applying the current provisions of §75.11(f) to Genesee's petition, EPA approves the petition to use Equation F-23 to quantify SO₂ mass emissions from Genesee Unit 01, in lieu of installing and certifying an SO₂ monitor. However, the Agency disapproves the 0.0006 lb/mmBtu default SO₂ emission rate requested by Genesee. The approved default SO₂ emission rates for Unit 01 are, instead, 0.014 lb/mmBtu for natural gas combustion and 0.17 lb/mmBtu for the combustion of wood.

The 0.014 lb/mmBtu default SO₂ emission rate for natural gas was calculated using the gas quality standard of a total sulfur of 5.0 grains per 100 cubic feet and a default gross calorific value (GCV) of 100,000 Btu per 100 cubic feet. Equation D-1h from section 2.3.2.1.1 of Appendix D to Part 75 was used for the calculation. The 0.17 lb/mmBtu default emission rate for wood combustion was calculated by substituting the "worst case" fuel sampling and analysis results provided by Genesee with the July 18, 2007 petition (i.e., 0.04% sulfur and a GCV value of 4,674 Btu/lb) into the following equation¹:

¹ Equation 1 is derived from a mass balance, assuming that all of the sulfur in the fuel is oxidized to SO₂, as follows: S + O₂ → SO₂. The equation is a variant of Equation 19-25 in EPA Method 19, in Appendix A-7 to 40 CFR Part 60, and has been adapted for wood sampling in lieu of coal.

$$ER = 2.0 \times 10^4 \left(\frac{\%S}{GCV} \right) \quad (\text{Equation 1})$$

Where:

ER = Default SO₂ emission rate for wood combustion (lb/mmBtu)

%S = Total sulfur content of the wood (percent)

GCV = Gross calorific value of the wood (Btu/lb)

2.0 x 10⁴ = Conversion factor (lb SO₂-Btu / %S-mmBtu-lb wood)

Conditions of Approval

The conditions of this approval are as follows:

1. Genesee shall use Equation F-23 in section 7 of Appendix F to Part 75 to calculate all hourly SO₂ mass emission rates for Genesee Unit 01. Genesee shall make appropriate modifications to the electronic monitoring plan for Unit 01, to represent this SO₂ monitoring methodology.
2. The approved default SO₂ emission rate of 0.014 lb/mmBtu shall be used when the unit combusts natural gas alone, and the approved 0.17 lb/mmBtu default SO₂ emission rate shall be used whenever any amount of wood is combusted. Alternatively, Genesee may elect to use the 0.17 lb/mmBtu default for all hours of operation, including those hours where the unit combusts only natural gas.
3. At least once a year, Genesee shall sample the wood combusted in Unit 01 and shall analyze it for total sulfur and GCV.. Based on the results of the analysis, Equation 1, above, shall be used to calculate an SO₂ emission factor. If multiple analyses are performed during the year, the highest sulfur and lowest GCV value from the analyses shall be used in the calculation. If, for a particular year, the SO₂ emission rate calculated in this manner is higher than the default rate currently in use, Genesee shall report the new value in the quarterly electronic data report and shall apply the new value, starting on January 1 of the next year.
4. Genesee shall continue to monitor and report NO_x mass emissions and heat input for Unit 01, in accordance with Part 75.

EPA's determination relies on the accuracy and completeness of the information provided by Genesee in the July 18, 2007 petition and by e-mail on October 10, 2008, and is appealable under Part 78. If you have any questions about this determination, please contact Louis Nichols, at (202) 343-9008. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: Constantine Blathras, EPA Region V
Tom Gasloli, Michigan DEQ
Louis Nichols, EPA CAMD