west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2663E
Plant ID No.:	079-00006
Applicant:	Appalachian Power Company
Facility Name:	John Amos Plant
Location:	Putnam County
NAICS Code:	221112
Application Type:	Modification
Received Date:	April 08, 2015
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$3,500
Date Received:	June 8, 2015
Complete Date:	July 20, 2015
Due Date:	October 16, 2015
Applicant Ad Date:	June 1, 2015
Newspaper:	*Charleston Gazette*
UTM's:	Easting: 428.16 km Northing: 4,258.42 km Zone: 17
Description:	Applicant is requesting a voluntary heat input capacity limit (10% of total capacity) on an annual basis to meet the definition of a limited use boiler per 40 CFR 63 Subpart DDDDD.

DESCRIPTION OF PROCESS

Appalachian Power Company's Mountaineer plant utilizes two (2) oil fired auxiliary boilers to provide steam during start ups and for building heating and chemical cleaning. One boiler (Aux 1) is 642 mmbtu/hr and the other (Aux 3) is 600 mmbtu/hr. These boilers are subject to 40 CFR 63 Subpart DDDDD (boiler MACT for major sources). They have a compliance date of January 31, 2016 for existing sources. The rule includes a category for limited use boilers. Boilers in this category have no numeric emission limits and are not subject to any stack testing requirements. To be eligible, the source must obtain a federally enforceable permit to limit the units annual capacity factor to 10% or less. This is the purpose of this permitting action.

SITE INSPECTION

No site inspection of the facility was performed for this permitting action. A full compliance inspection of the facility was performed by Mike Rowe of DAQ's Compliance and Enforcement Section on July 28, 2014. The facility was found to be in compliance. To get to the facility take I-64 west from Charleston to exit 44. At the end of the off ramp turn left on State Route 817. Go approximately 2.5 miles and the facility is on the right.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The auxiliary boilers were constructed in 1971. Therefore, they are grandfathered and have no existing emission limits (except for PM and SO_2 which are limited by rules 2 and 10 respectively). Therefore existing emissions are based on AP-42 Table 1.3-1 and assume they operate at full capacity 8,760 hours per day.

Emissions from Aux 1

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	128.40	562.4
Sulfur Dioxide	379.85	1,663.74
Carbon Monoxide	26.75	117.17
PM	10.70	46.87
PM_{10}	5.35	23.43
Volatile Organic Compounds	1.07	4.69

Emissions from Aux 3

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	120.00	525.60
Sulfur Dioxide	355.00	1,554.90
Carbon Monoxide	25.00	109.50
PM	10.00	43.80
PM_{10}	5.00	21.90
Volatile Organic Compounds	1.00	4.38

This means that combined emissions from the two boilers are as follows:

Combined Boiler Emissions

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	248.40	1,087.99
Sulfur Dioxide	734.85	3,218.64
Carbon Monoxide	51.75	226.67
PM	20.70	90.67
PM_{10}	10.35	45.33
Volatile Organic Compounds	2.07	9.07

Emission calculations submitted with this application were also based on AP-42. Hourly emissions are based on maximum design heat input (and therefore are identical to the existing emissions). Annual emissions are based on the 10% capacity factor. Emissions in the new permit will be limited to the following:

Emissions from Aux 1

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	128.40	56.24
Sulfur Dioxide	379.85	166.37
Carbon Monoxide	26.75	11.72
PM	10.70	4.69
PM_{10}	5.35	2.34
Volatile Organic Compounds	1.07	0.47

Emissions From Aux 3

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	120.00	52.56
Sulfur Dioxide	355.00	155.49
Carbon Monoxide	25.00	10.95
PM	10.00	4.38
PM_{10}	5.00	2.19
Volatile Organic Compounds	1.00	0.44

This means that combined emissions from the two boilers will be as follows:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	248.40	108.80
Sulfur Dioxide	734.85	321.86
Carbon Monoxide	51.75	22.67
PM	20.70	9.07
PM_{10}	10.35	4.56
Volatile Organic Compounds	2.07	0.91

This results in a net **decrease** in potential emissions of the following:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	--	-979.19
Sulfur Dioxide	--	-2,896.79
Carbon Monoxide	--	-204.00
PM	--	-81.60
PM_{10}	--	-40.77
Volatile Organic Compounds	--	-8.16

REGULATORY APPLICABILITY

The following state and federal rules apply to the auxiliary boilers.

STATE RULES

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.

The auxiliary boilers meet the definition of "fuel burning units" under 45CSR2 and are, therefore, subject to the applicable requirements therein. Each substantive requirement is discussed below:

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, the fuel burning units are subject to an opacity limit of 10%. Proper maintenance and operation of the oil fired units should keep the opacity of the units well below 10% during normal operations. The facility already has an approved Rule 2 monitoring plan which should ensure compliance.

45CSR2 Weight Emission Standard - Section 4.1.b

The allowable particulate matter (PM) emission rate for each auxiliary boiler, identified as a Type "b" fuel burning unit, per 45CSR2, Section 4.1.b, is the product of 0.09 and the total design heat input of the auxiliary boiler in million Btu per hour.

The maximum design heat input of auxiliary boiler AUX1 is 642 mmBtu/Hr. Using the above equation, the 45CSR2 PM emission limit of the auxiliary boiler would be 57.78 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM. The maximum potential hourly PM emissions from auxiliary boiler AUX 3 is estimated to be 10.70 lb/hr. This emission rate is significantly less the 45CSR2 limit.

The maximum design heat input of auxiliary boiler AUX 3 is 600 mmBtu/Hr. Using the above equation, the 45CSR2 PM emission limit of each auxiliary boiler would be 54.0 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM. The maximum potential hourly PM emissions from auxiliary boiler AUX 3 is estimated to be 10.00 lb/hr. This emission rate is significantly less than the 45CSR2 limit.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units". The auxiliary boilers are defined as a "fuel burning units". The applicable requirements are discussed below:

45CSR10 Fuel Burning Units - Section 3

The allowable sulfur dioxide (SO_2) emission rate for each auxiliary boiler, identified

as a Type "b" fuel burning unit, per 45CSR10, Section 3.3.f (note that Putnam county is in the Priority III region), is the product of 3.2 and the total design heat input of the auxiliary boiler in million Btu per hour.

The maximum design heat input of auxiliary boiler AUX 1 is 642 mmbtu/hr. Using the above equation, the 45CSR10 SO_2 emission limit of the auxiliary boiler is 2054.4 lb/hr. The maximum potential hourly SO_2 emissions from auxiliary boiler AUX 1 is estimated to be 379.85 lb/hr. This emission rate is far less than the 45CSR10 limit. The facility already has an approved Rule 10 monitoring plan which should ensure compliance.

The maximum design heat input of auxiliary boiler AUX 3 is 600 mmbtu/hr. Using the above equation, the 45CSR10 SO_2 emission limit of the auxiliary boiler is 1920 lb/hr. The maximum potential hourly SO_2 emissions from auxiliary boiler AUX 3 is estimated to be 355.00 lb/hr. This emission rate is far less than the 45CSR10 limit. The facility already has an approved Rule 10 monitoring plan which should ensure compliance.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

Appalachian Power Company applied for this permit modification on a voluntary basis, pursuant to §45-13-5.5.

As required under §45-13-8.3 ("Notice Level A"), Appalachian Power placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on June 1, 2015 in *The Charleston Gazette* and the affidavit of publication for this legal advertisement was submitted on July 1, 2015.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Amos Plant is an existing major source with an issued Title V permit. Said permit will have to be modified in accordance with 45CSR30.

FEDERAL RULES

40 CFR 63 Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters.

Subpart DDDDD includes requirements for several different subcategories of boilers. With the issuance of this permit, both auxiliary boilers will be classified as "Limited Use" boilers. The main requirement applicable to limited use boilers is the obligation to perform an initial tune up. Subsequently, a tune up will be required every 5 years.

NON APPLICABILITY DETERMINATIONS

40 CFR 60, Subpart Db: Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.

The auxiliary boilers are not subject to 40 CFR 60 Subpart Db because they were constructed before June 19, 1984 (they were constructed in 1971).

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The only HAPs emitted by the auxiliary boilers are those normally associated with fuel oil combustion. Since the purpose of this permitting action is only to limit the capacity factor of the two auxiliary boilers, annual potential emissions of HAPs will decrease.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing major stationary source, no modeling was performed.

MONITORING OF OPERATIONS

In addition to the monitoring already required in R13-2663E, the permittee will be required to monitor and record the following:

* Records of the monthly fuel feed rate and fuel heat content of the two auxiliary boilers.

CHANGES TO PERMIT R13-2663D

The following changes were made to R13-2663D:

* The permit was put into the most recent boilerplate.

* Auxiliary boilers AUX 1 and AUX 3 were added to Table 1.0.

* Conditions 4.1.17 through 4.1.23 were added. Conditions 4.1.19.1 and 4.1.20.1 were added to limit the two auxiliary boilers to an annual capacity factor of 10%.

* Condition 4.2.11 was added.

* Conditions 4.4.8 through 4.4.13 were added.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2663E to limit two auxiliary boilers at the John E. Amos Plant near Poca be granted to Appalachian Power Co.

Steven R. Pursley, PE
Engineer

7-20-15

July 20, 2015