west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2988A
Plant ID No.:	033-00015
Applicant:	Monongahela Power Company
Facility Name:	Harrison Power Station
Location:	Haywood, Harrison County
NAICS Code:	221112
Application Type:	Class II Administrative Update
Received Date:	February 2, 2016
Engineer Assigned:	John Legg
Fee Amount:	$300.00
Date Received:	February 12, 2016
Complete Date:	February 12, 2016
Due Date:	April 12, 2016
Applicant Ad Date:	February 4, 2016
Newspaper:	*The Exponent Telegram*
UTM's:	Easting: 557.4 km Northing: 4,359.5 km Zone: 17
Description:	Class II update to install a Refined Coal System for the application of sorbent chemicals to coal for NOx and possible Hg, and SO_2 reduction/control. Also added to the permit: seasonal (Oct - April; May - Sept) NOx emission rates (lb/mmBtu) for Units 1, 2 and 3 boilers based on a 30 day rolling average.

DESCRIPTION OF PROCESS

The Harrison Power Station is planning on using a clean coal technology known as Refined Coal to take advantage of federal income tax credits. In order to qualify for this tax credit the law requires that Refined Coal, which is burned to produce electricity, result in the reduction of NO_x and Mercury (Hg) or SO_2 emissions. In order to achieve these reductions two sorbents (S-Sorb: dry; and MerSorb: liquid) are applied to the coal.

The Refined Coal facility will be locate in an area between Harrison's existing cooling towers as is shown in the permit application diagrams on pages 11, 13, and 14 (note pages are hand-numbered).

The following information comes from the permit application, page 21 (hand-numbered), entitled, "Gallagher Clean Energy, Refined Coal System Process Description, FirstEnergy - Harrison Plant:"

Introduction

What follows is a detailed description of the layout and operation of the proposed Refined Coal System that will be installed at the Harrison Plant. For a general introduction to the Refined Coal program please refer to Attachment A to this evaluation entitled "Production of Refined Coal Using the Chem Mod Process." This attachment provides a description of the Refined Coal Program (IRS Section 45), information on the sorbents used in the process, how the sorbents reduce emissions, and description of a typical installation.

System Overview

The Refined Coal System at Harrison will consist of a mixer and the associated chemical application equipment necessary to add the required Chem-Mod sorbents to the coal necessary to produce Refined Coal. The unit numbers called out in this document reference the equipment unit number designated in the process flow diagram (Farnham & Pfile drawing 550-FS-0001; hand-numbered application page 14) which provides a graphic presentation of the system.

Pug Mill Mixer

The mixer (UNIT 3100) will be installed in a new process building which received coal from conveyors 4A/B via a new pugmill feed conveyor (UNIT 2500). Conveyors C4A/B will be tripped via flop gates that allow the coal to either be fed to the mixer to produce Refined Coal or to bypass the mixer so that the boiler can be operated on coal directly reclaimed from the yard to minimize detrimental impact on the power station availability. The mixer will be a twin screw pug mill which has a capacity of processing 1500+ tons of coal per hour. The sorbents (MerSorb and S-Sorb) will be added to the mixer along with the coal at the feed end of the mixer.

MerSorb (liquid) System

The MerSorb (liquid) application system will be located in a new pumphouse adjacent to the Refined Coal process building.The primary components of this system will be a 405 gallon day storage tank (UNIT 3700), application pumps (UNITS 3720, 3730), and a flow meter (UNIT 3750).

S-Sorb (dry) System

The S-Sorb (dry) application system will be installed inside the Refined Coal process building. The primary components will be a 15 ton day bin (UNIT 3200), rotary vane feeder (UNIT 3210) to control the application rate, and a screw conveyor (UNIT 3220) to move the S-Sorb to the mixer.

Bulk Storage

In addition to the application systems there will be bulk storage systems for MerSorb and S-Sorb. For S-Sorb there will be two 150 ton capacity silos (UNITS 8200/8300) and a transfer blower (UNIT 8100). For MerSorb there will be a 4,400 gallon storage tank (UNIT 3500) and transfer pumps (UNITS 3510/3520). These systems provide for bulk storage of sorbents on site to ensure availability. They also provide the means to transfer from the bulk storage containers to the day bin/tank for application.

Power and Control

The facility has a new Motor Control Center (MCC) to provide power to all components. The MCC will be fed from the station bus via a new transformer. The facility has a PLC based control system. The PLC receives input from process instrumentation and provides output control signals to all components in the system. The PLC will be installed along with the MCC in a new electrical building.

Process

The coal being fed to the boiler house will be diverted from the discharge of Conveyors 4A and 4B at the trip installed in a new transfer tower. Coal will be transported from the trip via a new conveyor (UNIT 2500) into the mixer. Scales installed in the new pugmill discharge conveyor (UNIT 5100) senses the coal flow rate through the system and transmits that information to the PLC. The facility PLC calculates the required flow rates of MerSorb and S-Sorb for the given coal flow.

MerSorb (liquid) will be pumped from the day tank by an application pump, through a flow meter and into distribution manifold in the mixer where it will be applied to the coal. The application pumps will be fitted with variable frequency drives that will be controlled by the PLC. The measured flow rate will be communicated to the PLC which continuously adjusts the pump speed to match the flow of MerSorb to the coal flow.

S-Sorb (dry) will be fluidized in the day bin and discharged via a rotary vane feeder. The vane feeder will be fitted with a variable frequency drive that will be controlled by the PLC. The day bin sits on load cells which supply net weight indication to the PLC. As S-Sorb is discharged from the bin the change in weight will be used by the PLC to calculate the application rate of the S-Sorb. The PLC continuously adjusts the vane feeder to match flow of S-Sorb to the coal flow. The S-Sorb will be discharged from the vane feeder into a transfer screw conveyor which discharges the S-Sorb to the mixer where it will be applied to the coal.

The mixer discharges the now Refined Coal to the pugmill discharge conveyors (Units 5100/5600). The pubmill discharge conveyor discharges the Refined Coal back to Conveyors 4A/B downstream of the extraction point in another new transfer structure via a flop gate (UNIT 5700) where the coal can be sent to Conveyor 4A or 4B.

Table 1: Emission Unit Table for Refined Coal System.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
RC 3100	1E	Pug Mill Mixer	2016	1,500 TPH	FE
RC 3200	2E	S-Sorb Day Bin	2016	15 ton	(1) Bin Vent Filter/FE
RC 3500	3E	MerSorb Storage Tank	2016	6,100 gallons	FE
RC 3700	4E	MerSorb Day Storage Tank	2016	405 gallon	FE
RC 8200	5E	S-Sorb Storage Silo	2016	150 tons	(2) Bin Vent Filter
RC 8300	6E	S-Sorb Storage Silo	2016	150 tons	(2) Bin Vent Filter
PHaul	PHaul	Existing paved facility roadways	N/A	N/A	Water Truck

(1) Passive Bin Vent MAC 39AVSC25. Total Area of Filter Media: 900 ft^2. Filter Efficiency: 99.92%.
(2) Passive Bin Vent C&W CP-LPR-8-S. Total Filtration Area 356 ft^2. Number of filter cartridges: 8. Minimum Design Efficiency: 99.99%.

MSDS (Attachment H)

Attachment H to the permit application contained two (2) Material Safety Data Sheets (MSDS):

1. **S-Sorb III** (application hand-numbered pages 25 -36):

   CAS No. 7789-41-5; A mineral composite of calcium aluminosilicate compounds and other calcium compounds containing iron, magnesium, and sulfur; Synonyms: Calcium Aluminosilicate, **Cement Kiln Dust**. Coal additive for Mercury emission reduction.

   Gray to White Power; Odorless; pH (in water) 10 to 12.5; Relative Density 2.6 to 2.8 (water = 1.0); Solubility 2 to 20% (in water).

2. **MerSorb** (application hand-numbered pages 37 - 46):

   CAS No. 7789-41-5; Halide Salt Solution; Synonyms: Calcium Bromide Solution, Brine Solution. Coal additive for Mercury emission reduction.

   Clear Liquid; Odorless; pH 6 to 8; Relative Density > 1.68 (water = 1.0); Miscible.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following paragraph from the application cover letter dated 1/29/16 discusses emissions from the Refined Coal facility:

> The Refined Coal facility will consist of a mixer and the associated application equipment needed to apply the sorbents to the coal supply from the existing crusher house conveyors. The installed equipment will also consist of storage silos, storage tanks, conveyors and pumps. As detailed in the enclosed application, the conveyors will be fully-enclosed, as well as the two storage tanks. The silos will be equipped with bin vents to significantly reduce potential particulate emissions to de minimus levels. As a result, the only emissions increase of any pollutant will be the particulate emissions resulting from the increased delivery truck traffic on the existing paved facility roadways.

Haul Road Emissions will increase due to the delivery of the S-Sorb and MerSorb. Emissions from the haulroads were based on AP-42 Section 13.2.1.3 for paved roads. Annual emissions were based on yearly throughputs. Hourly emissions assume a steady delivery of sorbent over 8 hours per day, 365 days per year. Monongahela also assumed an 80% control efficiency for the use of water sprays on the road ways.

Sorbent Material and Amount Delivered		Pollutant	Controlled (80% - water spray dust suppression)	
S-Sorb	MerSorb		(lb/hr)	(ton/yr)
950 deliveries 25 ton/truck 23,750 ton/yr	36 deliveries 3,200 gallon/truck 115,200 gallon/yr	PM	0.29	0.43
		PM10	0.06	0.09
		PM2.5	0.02	0.02

REGULATORY APPLICABILITY

The proposed modification is subject to the following state rules (no federal air rules apply to the installation of the Refined Coal System):

STATE RULES

45CSR2: To Prevent And Control Particulate Air Pollution From Combustion Of Fuel In Indirect Heat Exchangers.

The main requirement of 45CSR2 applicable to this modification is the requirement that all sources of fugitive particulate matter to be equipped with a fugitive particulate matter control system. Transfer of the S-Sorb will be controlled by bin vent filters until the material is fluidized.

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

- Monongahela submitted a permit application to make several substantive changes to it's existing permit.

- Since these changes do not result in an increase of emissions of more than 6 pounds per hour and 10 tons per year, the changes can be made as a Class II Administrative Update.

- As required under §45-13-8.3 ("Notice Level A"), Monongahela placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on February 4, 2016 in *The Exponent-Telegram* and the affidavit of publication for this legal advertisement was submitted on February 10, 2016.

45CSR30: Requirements For Operating Permits.

The facility is an existing Title V major source with an issued Title V permit (R30-03300015-2015). Monongalela must update their Title V permit in accordance with 45CSR30.

MONITORING OF OPERATIONS

In addition to the monitoring already required by R13-2988, the Reduced Coal system will require the following monitoring:

* Records of the amount of each type of sorbent delivered to the facility.

CHANGES TO PERMIT R13-2988

A compare file highlighting the differences between R13-2988A (New) and R13-2988 (Old) is given in Attachment B to this evaluation. Listed below are changes made to the permit resulting from the addition of the Reduced Coal System:

* Table 1.0 was updated to include the new equipment.
* Condition 4.1.1 was updated to include permit application R13-2988A.
* New conditions 4.1.8 through 4.1.12 were added. Old condition 4.1.8 was renumbered to 4.1.14.
* New conditions 4.2.3 through 4.2.5 were added.

ADDITION OF SEASONAL NOX EMISSION RATES

Seasonal NOx emission rates were added to permit R13-2988A (New). The language, provided below, was developed as a result of permitting a similar Refined Coal System at Allegheny Energy Supply Company, LLC's Pleasants Power Station under Class II Administrative Update R13-3082A. (This permit was appealed by the company to the West Virginia Air Quality Board on January 5, 2016. A settlement was reached between the company and the DAQ with a settlement agreement and order (16-01-AQB) being signed by both parties on April 18, 2016.) Exception language specific to the Harrison Power Station was developed for Unit 2 boiler and is provided below in 4.1.13.b., footnote 1.

4.1. Limitations and Standards

4.1.13. NOx emissions from the Units 1, 2 and 3 boilers shall not exceed the following based on a rolling 30 day average. For the purposes of this permit, a rolling 30 day average shall mean the average daily (calendar day) emission rate from the last 30 operating days, excluding NOx emissions during periods that urea injection to the selective catalytic reduction system must be discontinued due to low flue gas temperature to avoid damaging the catalyst. Low flue gas temperature conditions shall mean when the temperature of the flue gas is less than 605°F during any operating hour and this time shall be excluded from the operating day for the purpose of averaging. An operating day shall mean a calendar day in which either boiler is operated for at least one hour.

a. The NOx emission rate shall not exceed 0.25 lb/mmbtu on a 30 day rolling average; and

b. Beginning the 30 day period that commences on May 1 and ends on May 30 and for each succeeding 30 day period through September 30, the NOx emission rate shall not exceed [(1)] 0.20 lb/mmbtu.

[(1)] But for the following one-time exception for Unit 2 boiler only, during the five (5), consecutive 30 day periods of May through September 2016, preceding and during a catalyst replacement: The NOx emission rate shall not exceed 0.28 lb/mmbtu on a 30 day rolling average.

c. The permittee shall monitor the catalyst flue gas temperature and record it as rolling block hourly averages. The recorded information shall include the date, hour, catalyst flue gas temperature, urea flow and an indicator that shows if the urea flow has been discontinued due to low flue gas temperature.

d. The permittee shall maintain on-site the records required in 4.1.13.c. for a period of five (5) years. Such records may be in electronic form but must be available for inspection by designated agents of the DAQ and exportable to standard database/spreadsheet formats.

4.2. Testing Requirements

4.2.5. In order to determine compliance with condition 4.1.13, the permittee shall install, certify, operate and maintain continuous emissions monitoring systems (CEMS). Said CEMs shall be designed, installed, operated and maintained in accordance with 40 CFR 75 as applicable.

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 R13-2988A for the installation of a Refined Coal System at the Harrison Power Station near Haywood be granted to Monongahela Power Company.

John Legg
Permit Writer

May 24, 2016

Attachment A

Production of Refined Coal Using the Chem-Mod Process

Fact Sheet R13-2988A

Monongahela Power Company

Harrison Power Station

Haywood, Harrison County, WV

The attached information was found in Attachment G of permit application R13-2988A. It is provided to given the reader additional background information of the Refined Coal System using the Chem-Mod Process.

Purpose

The facility and process described in this report is designed to produce a Refined Coal fuel as described in Title 26, Section 45 of the United States Code. This code requires that for a fuel of qualify as a Refined Coal, it must exhibit reduced emission of Nitrogen Oxides (NO_x) combined with reduced emission of either Sulfur Dioxide (SO_2) or Mercury (Hg) when burned in the production of steam.

Most Refined Coal production facilities will be constructed at the facility which will burn the fuel (host facility). This eliminates the need to protect the Refined Coal from weathering as it can be produced and supplied on a just in time basis. Likewise it allows for reliable compliance with the regulatory requirement that the Refined Coal be burned in the production of steam. This report is written to describe such an installation.

Process

The Chem-Mod Process uses proprietary chemical sorbent additives to reduce the formation of NO_X and for the capture of Hg when coal is burned to produce steam for commercial use, industrial processes, or the generation of electricity.

The Chem-Mod solution is a dual-reagent coal pretreatment method which uses a halogen for mercury oxidation and a dry-powder sorbent for capture of mercury and other oxidized metals. The halogen is added to the coal as a salt solution, in this case 52% $CaBr_2$ in water. The Chem-Mod trade name for this additive is MerSorb. The dry powder sorbent is made from raw feed, product and by-product materials from the cement industry. The Chem-Mod trade name for this additive is S-Sorb. The S-Sorb properties are specified for different rank coals to avoid unwanted balance-of-plant (BoP) or emissions issues. The component materials in the S-Sorb are dictated by the applicable specification. These two reagents are typically added to the coal when the coal is bunkered for firing in the stream generator. The product of the coal and additives is called Refined Coal.

When coal is burned Mercury (Hg) is released from the mineral matrix in elemental form (Hg^0). Mercury in coal is mainly associated with sulfide minerals such as pyrite. The Hg^0 is gaseous at all temperatures throughout the boiler and air quality control (AQC) system, and as it is comparatively non-reactive, most all is released up the stack. When Refined Coal is burned the MerSorb is thermally decomposed in the furnace and the Bromine (Br) reacts with Hg^0 to produce the oxidized from (Hg^{2+}). The Hg^{2+} form is very reactive and can be removed from the flue gases in a number of ways. It can react with solid particles such as the S-Sorb. It also can be absorbed on powdered activated carbon (PAC) or in wet scrubber liquor. The metals captured by the S-Sorb, including Hg are bound in a zeolite-type structure, which are not leachable to the environment. TCLP data show that Chem-Mod Refined Coal ash has lower levels of most constituents compared to untreated coal. TCLP levels are consistently less than RCRA limits and in most all cases are below Drinking Water limits. In the Chem-Mod solution, NO^x emissions are reduced by reaction with the S-Sorb. NO_x is reduced by simple base-acid chemical reactions with elements in the S-Sorb.

Chem-Mod in cooperation with B&W also offers an alternative TriSorb (three-sorbent) solution, which includes the use of MitagentTM in conjunction with the original solution (MerSorb plus S-Sorb). Mitagent reduces the amount of BR required for Hg oxidation, and also reacts with non-metal gas-phase species such as Selenium (Se), Phosphorus (P) and Arsenic (As). The latter two elements are known to cause SCR catalyst deactivation. Phosphorus occurs in higher concentrations in some Powder River Basin coals, and As is common in high-sulfur Eastern coals. It should be added that the S-Sorb also is known to react with gas-phase AS and consequently improve catalyst lifetimes.

Facility

Sorbents are delivered to the facility in various ways, depending upon the production capacity of the facility. S-Sorb and Mitagent are delivered as a dry bulk product usually supplied in pneumatic tank trucks or rail cars. MerSorb is provided as an aqueous solution delivered in tank trucks, rail cars, or chemical totes.

Upon receipt, the sorbents are conveyed or pumped to appropriate on site storage facilities; tanks or tote storage areas for the liquid MerSorb and silos for the dry S-Sorb. Again, the size of the on site storage containers are determined by the production capacity of the facility to provide a reasonable on site volume for production. Containment structures will be constructed to comply with applicable regulations.

Coal is diverted from the existing host plant feed system to the Refined Coal facility for the purpose of adding the sorbents to produce a Refined Coal. The conveyors and mixers of the Refined Coal facility are of sufficient capacity to process all coal used by the host facility at the maximum rate the host facility reclaims the coal from its storage yard. The coal is conveyed to the mixer where it is combined with the S-Sorb, Mer Sorb, and possible Mitagent. The MerSorb is pumped from the storage tank(s) to the mixer using a metering pump which can be controlled to provide the required mass of sorbent to the coal stream. The coal and sorbents are then thoroughly mixed in a mechanical device sized to provide even distribution of the sorbents with the coal. The Refined Coal is then conveyed back to the host facility's coal reclaim system for use in the furnaces.

Scales, flow meters, volumetric controls, pressure, temperature, and other instrumentation is provided as necessary to properly control the process. Inputs from the measuring devices are fed to a process control system which controls all components to properly proportion and blend the components to produce a consistent product.

The facility is designed such that all coal flow can bypass the facility at any time so as not to adversely impact operation of the host facility in the unlikely event that the Refined Coal facility is inoperable.

Effects on Host Facility

The primary effect on the host facility is the reduction of NOx and Hg air emissions from the facility. NOx is reduced by adsorption in the boiler. Hg is reduced by the oxidation of elemental mercury and the subsequent capture of mercuric compounds in ceramicized matrices in the ash which is captured as fly ash or bottom ash in the host facility's collection systems.

The Refined Coal facility may add three to five transfer points to the fuel handling system, depending on the configuration of the existing reclaim system. These transfer points will be controlled for fugitive dust in the same manner as existing systems or as required by regulation.

The sorbent additives essentially increase the "ash" component to the fuel and report to the ash collection equipment of the host facility. The sorbents will typically increase the ash percentage of the fuel 0.3%. The host facility must be capable of handling this increase ash loading in the fuel gas particulate removal and handling systems.

In some facilities burning sub-bituminous coals, boiler deposits and corrosion of downstream flue gas components have been observed. These detrimental effects have been resolved by changes in plant operating procedures and in some cases material retrofits.

Stations have benefitted from increased SCR catalyst life due to S-Sorb and Mitagent reacting with gas phase Arsenic and Phosphorous.

Stations equipped with wet flue gas desulfurization equipment may utilize the Tri-Sorb version of Refined Coal to allow use of halogen oxidizers for Hg control by counteracting the effect halogens have on selenium species which may cause water quality issues in scrubbed units.

Attachment B

Compare File Highlighting the Changes Made

to Permit R13-2988 (Old) to Arrive at Permit R13-2988A (New)

WordPerfect Document Compare Summary

Original document: Q:\AIR_QUALITY\J_LEGG\Monongahela Power Company\R13-2988A\033-00015_PERM_13-2988.wpd
Revised document: @PFDesktop\:MyComputer\Q:\AIR_QUALITY\J_LEGG\Monongahela Power Company\R13-2988A\033-00015_PERM_13-2988A.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 25 Deletions, 50 Insertions, 0 Moves.

West Virginia Department of Environmental Protection
Division of Air Quality

Earl Ray Tomblin
Governor

Randy C. Huffman
Cabinet Secretary

Permit to ~~Modify~~Update

R13-2988A

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45 C.S.R. 13 — Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the facility listed below is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

~~Alleg~~Monongahe~~ny Energy Supply~~la Power Company~~, LLC~~
Harrison Power Station
033-00015

~~John A~~William F. ~~Benedict~~Durham
Director

Issued: ~~November 9~~May 25, ~~2012 • Effective: November 9, 2012~~2016

Facility Location:	Haywood, Harrison County, West Virginia
Mailing Address:	800 Cabin Hill Drive (Room ~~C-109~~A-301) Greensburg, PA 15601
Facility Description:	Power Plant
NAICS Codes:	221112
UTM Coordinates:	557.392 km Easting • 4,359.489 km Northing • Zone 17
Permit Type:	~~Modification~~
~~Description of Change:~~	~~Replacement of a rotary railcar dump with a new rapid discharge rail unloading system.~~Class II Administrative Update
Description of Change:	Class II update to install a Refined Coal System for the application of sorbent chemicals to coal for NOx and possible Hg, and SO_2 reduction/control. Also added to the permit: seasonal (Oct - April; May - Sept) NOx emission rates (lb/mmBtu) for Units 1, 2 and 3 boilers based on a 30 day rolling average.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

The source is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

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1.0 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
RDRU	EP-1	Rapid Discharge Rail Unloader to Belt Feeder	2012*	3,000 TPH	Chemical Fogging System
BF-01	EP-2	72" Unloading Belt Feeder	2012*	3,000 TPH	Enclosure/CFS
CV-01	EP-3	54" Load -out Conveyor	2012*	3,000 TPH	Enclosure/CFS
CV-02	EP-4	60" Conveyor	2012*	3,000 TPH	Enclosure/CFS
CV-03	EP-5	48" Conveyor (to Transfer Tower)	2012*	3,000 TPH	Enclosure/CFS
CV-04	EP-6	60" Conveyor ~~to~~ (Stacking Tubes)	2012*	3,000 TPH	Enclosure/CFS
ST-003	EP-7	Stacking Tube/Coal ~~Pile~~Pile/Bulldozing	2012*	3,000 TPH	None
RC 3100	1E	Pug Mill Mixer	2016	1,500 TPH	FE
RC 3200	2E	S-Sorb Day Bin	2016	15 ton	(1)Bin Vent Filter/FE
RC 3500	3E	MerSorb Storage Tank	2016	6,100 gallons	FE
RC 3700	4E	MerSorb Day Storage Tank	2016	405 gallon	FE
RC 8200	5E	S-Sorb Storage Silo	2016	150 tons	(2) Bin Vent Filter
RC 8300	6E	S-Sorb Storage Silo	2016	150 tons	(2)Bin Vent Filter
PHaul	PHaul	Existing paved facility roadways	N/A	N/A	Water Truck

* Year Installed changed from 2012 to "To be installed" under R13-2988A submitted 2/2/2016.
(1) Passive Bin Vent MAC 39AVSC25. Total Area of Filter Media: 900 ft^2. Filter Efficiency: 99.92%.
(2) Passive Bin Vent C&W CP-LPR-8-S. Total Filtration Area 356 ft^2. Number of filter cartridges: 8. Minimum Design Efficiency: 99.99%.

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Law W.Va. Code §§22-5-1 et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

2.4.1. This permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any applicable legislative rule.

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-2988, R13-2988A and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to; **[45CSR§§13-5.11 and 13-10.3]**

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses and/or approvals from other agencies; i.e., local, state and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State-Enforceable only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345

If to the USEPA:

Associate Director
Office of Air Enforcement and ~~Permits Review~~
Compliance Assistance
(~~3AP12~~3AP20)
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

(5) The Administrator or delegated authority may object to the fugitive coal dust emissions control plan as specified in paragraphs (c)(5)(i) of this section.
[40CFR§60.254(c)(5)]

(i) The Administrator or delegated authority may object to any fugitive coal dust emissions control plan that it has determined does not meet the requirements of paragraphs (c)(1) and (c)(2) of this section.
[40CFR§60.254(c)(5)(i)]

(ii) If an objection is raised, the owner or operator, within 30 days from receipt of the objection, must submit a revised fugitive coal dust emissions control plan to the Administrator or delegate authority. The owner or operator must operate in accordance with the revised fugitive coal dust emissions control plan. The Administrator or delegated authority retain the right, under paragraph (c)(5) of this section, to object to the revised control plan if it determines the plan does not meet the requirements of paragraphs (c)(1) and (c)(2) of this section.
[40CFR§60.254(c)(5)(ii)]

(6) Where appropriate chemical dust suppressant agents are selected by the owner or operator as a control measure to minimize fugitive coal dust emissions, (1) only chemical dust suppressants with Occupational Safety and Health Administration (OSHA)-compliant material safety data sheets (MSDS) are to be allowed; (2) the MSDS must be included in the fugitive coal dust emissions control plan; and (3) the owner or operator must consider and document in the fugitive coal dust emissions control plan the site-specific impacts associated with the use of such chemical dust suppressants.
[40CFR§60.254(c)(6)]

4.1.8. The process rates contained in Table 1.0 of this permit shall not be exceeded. Additionally, the permittee shall install, maintain and operate all control devices listed in Table 1.0 of this permit.

4.1.9. The total amount of S-Sorb delivered to the two S-Sorb Silos (RC Units 8200 and 8300) combined shall not exceed 23,750 tons per year. Compliance with this condition shall be based on a rolling twelve month total.

4.1.10. S-Sorb Silos (RC Units 8200 and 8300) shall be equipped with fabric filters. Said filters shall be designed, installed, operated and maintained so as to reduce particulate matter emissions by at least 99.99%.

4.1.11. S-Sorb Day Bin (RC Unit 3200) shall be equipped with a fabric filter. Said filter shall be designed, installed, operated and maintained so as to reduce particulate matter emissions by at least 99.92%.

4.1.12. The total amount of MerSorb delivered to the MerSorb storage tank (RC Unit 3500) shall not exceed 115,200 gallons per year. Compliance with this condition shall be based on a rolling twelve month total.

4.1.13. NOx emissions from the Units 1, 2 and 3 boilers shall not exceed the following based on a rolling 30 day average. For the purposes of this permit, a rolling 30 day average shall mean the average daily

(calendar day) emission rate from the last 30 operating days, excluding NOx emissions during periods that urea injection to the selective catalytic reduction system must be discontinued due to low flue gas temperature to avoid damaging the catalyst. Low flue gas temperature conditions shall mean when the temperature of the flue gas is less than 605°F during any operating hour and this time shall be excluded from the operating day for the purpose of averaging. An operating day shall mean a calendar day in which either boiler is operated for at least one hour.

a. The NOx emission rate shall not exceed 0.25 lb/mmbtu on a 30 day rolling average; and

b. Beginning the 30 day period that commences on May 1 and ends on May 30 and for each succeeding 30 day period through September 30, the NOx emission rate shall not exceed [(1)]0.20 lb/mmbtu.

[(1)] But for the following one-time exception for Unit 2 boiler only, during the five (5), consecutive 30 day periods of May through September 2016, preceding and during a catalyst replacement: The NOx emission rate shall not exceed 0.28 lb/mmbtu on a 30 day rolling average.

c. The permittee shall monitor the catalyst flue gas temperature and record it as rolling block hourly averages. The recorded information shall include the date, hour, catalyst flue gas temperature, urea flow and an indicator that shows if the urea flow has been discontinued due to low flue gas temperature.

d. The permittee shall maintain on-site the records required in 4.1.13.c. for a period of five (5) years. Such records may be in electronic form but must be available for inspection by designated agents of the DAQ and exportable to standard database/spreadsheet formats.

4.1.~~9~~14. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

4.2. Testing Requirements

4.2.1. The permittee shall comply with all applicable standards of 40 CFR 60 Subpart Y including but not

(ii) Conduct monthly visual observations of all processes and control equipment. If any deficiencies are observed, the necessary maintenance must be performed as expeditiously as possible.
[40CFR§60.255(f)(1)(ii)]

(iii) Conduct a performance test using Method 9 of Appendix A-4 of this part at least once every 5 calender years for each affected facility.
[40CFR§60.255(f)(1)(iii)]

(2) Prepare a written site-specific monitoring plan for a digital opacity compliance system for approval by the Administration or delegated authority. The plan shall require observations of at least one digital image every 15 seconds for 10-minute periods (during normal operation) every operating day. An approvable monitoring plan must include a demonstration that the occurrences of visible emissions are not in excess of 5 percent of the observation period. For reference purposes in preparing the monitoring plan, *see* OAQPS "Determination of Visible Emission Opacity from Stationary Sources Using Computer-Based Photographic Analysis Systems." This document is available from the U.S. Environmental Protection Agency (U.S. EPA); Office of Air Quality and Planning Standards; Sector Policies and Programs Division; Measurement Group (D243-02), Research Triangle Park, NC 27711. This document is also available on the Technology Transfer Network (TTN) under Emission Measurement Center Preliminary Methods. The monitoring plan approved by the Administrator delegated authority shall be implemented by the owner or operator.
[40CFR§60.255(f)(2)]

4.2.2. The permittee shall perform daily monitoring and recordkeeping of the total daily sorbent usage rate, and records of startups, shut-downs, malfunctions, and maintenance of the Refined Coal System. Daily records maintained in accordance with this paragraph shall be available upon request at the facility.

4.2.3. In order to determine compliance with condition 4.1.9, the permittee shall monitor and record the amount of S-Sorb delivered to the facility on a daily basis.

4.2.4. In order to determine compliance with condition 4.1.12, the permittee shall monitor and record the amount of MerSorb delivered to the facility on a daily basis.

4.2.5. In order to determine compliance with condition 4.1.13, the permittee shall install, certify, operate and maintain continuous emissions monitoring systems (CEMS). Said CEMs shall be designed, installed, operated and maintained in accordance with 40 CFR 75 as applicable.

4.3. Monitoring and Recordkeeping Requirements

4.3.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;