west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2852
Plant ID No.:	035-00048
Applicant:	Carbonyx International USA, Inc.
Facility Name:	Ravenswood Facility
Location:	Ravenswood, Jackson County
SIC Code:	2999
Application Type:	Construction
Received Date:	August 17, 2010
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$2,000.00
Date Received:	August 19, 2010
Complete Date:	October 22, 2010
Due Date:	January 18, 2010
Applicant Ad Date:	September 23, 2010
Newspaper:	*Jackson Newspapers*
UTM's:	Easting: 427.93 km Northing: 4,307.67 km Zone: 17
Description:	Construction of a 1,000,000 ton per year "Cokonyx" facility.

DESCRIPTION OF PROCESS

The facility will be composed of four 250,000 ton per year modules for a total production rate of 1,000,000 tons per year. Each 250,000 ton per year module will consist of two production lines. The Carbon Alloy Synthesis (CASP) system can be divided into five general steps.

RAW MATERIAL RECEIVING AND HANDLING

The first step in the CASP system is the raw material receiving and preparation area. The raw material (coal) will be delivered to the facility either by rail or barge. Barged raw materials will be unloaded by crane and transferred to dump trucks for the short drive to the facility raw material storage area. Materials will be unloaded from the rail cars through bottom dumps and transferred by conveyor belts to storage piles. A dust collector will be used to minimize emissions at the rail car unloading station. Front end loaders may be used to assist in the material handling activities.

The wet coal will be stored in outdoor storage piles in quantities sufficient to maintain approximately two weeks of production.

RAW MATERIAL PREPARATION

Prior to use in the CASP production lines, the raw, wet coal is dried and crushed. Each of the two proposed CASP production lines within the 250,000 tpy module will include its own dryer and crusher. The proposed units each have a capacity of 50 tons per hour, with typical operating rates of 35 tph expected.

The coal is transferred via front-end loader from the outdoor storage piles to one feed bin, from which it is transferred via belt conveyors to the coal dryers. The coal is dried using air heated by exhaust gases from the Feed Enhancement Reactors (FERs) discussed later. The exhaust from the dryers is treated by a dust collector, and the dried coal is transferred via screw conveyors to a crusher. The crushed, dried coal is then transferred by a drag conveyor to one of several feed silos for immediate storage. The dried coal storage silos will serve both of the drying and crushing lines in each 250,000 tpy module.

FIRST STAGE PROCESSING

After the coal is received and prepared (dried and crushed), it is blended in predetermined proportions and fed to the first processing unit, the Feed Enhancement Reactor (FER). The FER provides the first step in the alloy synthesis process, as certain organic elements are driven off from the raw material. The off gases produced in the FER have significant residual heat content, and are recycled for combustion in the afterburner, which provides all the necessary energy for both the FER and the coal dryers. The afterburner exhaust passes through an air to air heat exchanger (providing heat for the coal dryers), and then passes through an SO_2 and PM control device (scrubber and baghouse respectively) prior to release to the atmosphere. While virtually all of the heat required by the system will be provided by the coal off-gas during steady state operations, natural gas will be used as a backup fuel to both the FER and afterburner. Natural gas will also be fired during system startup, until sufficient fuel is available for the coal off gas.

Each of the two CASP lines will include two FERs, for a total of four per module, with a maximum production rating of six tph and typical production rates of five tph. The product from the four FERs , referred to as “Carborec”, is cooled, aggregated, crushed and transferred to a single Carborec storage silo.

SECOND STAGE PROCESSING

The Carborec is transferred from its storage silo and blended with dried coal and other additives to meet product requirements. The blended Carborec feed is then molded into a billet form. These billets are loaded onto transfer cars and sent to the Particle Fusion Reactor (PFR) for final processing. The PFR is a tunnel-type kiln with various

processing zones in which several reactions occur, converting the Carborec into a semi-crystalline carbon alloy product, “Cokonyx”. The proposed facility will include two PFRs operating in parallel per module (one per CASP production line); each designed to produce 20 tph of Cokonyx from 30 tph of Carborec and coal input. The typical production rates for each PFR will be 23 tph of total input and 16 tph of Cokonyx produced. The total annual production target for the two lines is 250,000 tpy of Cokonyx.

As with the FER, the exhaust gas from the PFR is recycled for combustion, providing all heat necessary to drive the alloying process in the PFR. The exhaust gases pass through a low-NO_x afterburner, virtually eliminating CO and VOC emissions. As with the FER, the PFRs and associated afterburners are equipped with natural gas for use during process startup and as a backup fuel.

Following the heat recovery system, the afterburner exhaust passes through a scrubber then a baghouse and is then exhausted to the atmosphere.

A cogeneration system will be added to the plant in the future and is included in this permit application. When the cogeneration system is in place, the exhaust will pass through a steam generation system after passing through the after burner, in which a heat exchanger utilizes residual heat in the exhaust stream in order to generate steam. The steam is then used to generate electricity via a turbine. The electricity generated by the cogeneration system will be used to power the facility, and excess power will be sold to the grid or third party. The proposed future cogeneration system will include two steam generators, one for each PFR and a single cogeneration turbine per module. The capacity of the cogeneration system is approximately 20-25 megawatts per module.

FINISHED PRODUCT HANDLING

Upon exiting the PFR, the Cokonyx is cooled with water sprays, and classified by size according to product specifications. Products from both CASP production lines will be stored outdoors in storage piles prior to shipment from the facility either by barge or rail.

DISTINCTION BETWEEN COKONYX AND COKE

The CASP system is distinct from existing coke production technologies, such as slot or beehive ovens. While the Cokonyx product is similar to traditional coke, the process is different from the existing technologies. Current coke production systems take metallurgical coal and apply heat in order to remove hydrocarbons. In essence, they are refining processes that remove impurities from a raw material to yield a more concentrated product. The Cokonyx CASP system mixes different types of coal (i.e., thermal coal and anthracite coal) and synthesizes a new carbon alloy structure that has properties similar to coke produced from metallurgical coal.

Aside from the fundamental difference vis-á-vis refining and synthesis, the PFR of the CASP system uses a different mechanism for heat transfer from the existing coke

production processes. The beehive coke production process combines combustion and raw materials in a single zone, and heat transfer to the raw materials is accomplished via convection. Slot oven processes separate the combustion zone from the raw materials and heat transfer is accomplished via conduction. In the PFR, combustion occurs in a zone distinct from the raw materials and combustion gases heat the barrier that divides the two zones. Unlike slot ovens, though, the raw materials do not contact this barrier directly. Instead, the barrier heats the raw material through radiative heat transfer. The applicant states that this provides greater heat transfer efficiency for the temperature ranges under consideration and that this increased efficiency results in a lower energy burden for the CASP system compared to traditional coke production systems.

SITE INSPECTION

A site inspection of the proposed site was performed by the writer on September 1, 2010. The proposed site will be adjacent to the existing Alcan/Century Aluminum facility near Ravenswood. To get to the facility, take I-77 north to Ripley (exit 138). Turn left on WV Route 62 and proceed approximately 8.5 miles. Then turn right on WV Route 2. Proceed approximately 2 miles and the site will be located on the left near the south entrance to the Alcan/Century access road.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Controlled emissions from the facility shall not exceed the following:

Source	PM		PM_{10}		NO_x		VOC		SO_2		CO		HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1A-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
2A-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
3A-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
4A-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
5A-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
6A-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
7A-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
8A-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
9A-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
10A-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--

11A-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
12A-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
13A-E	--	--	--	--	--	--	0.01	0.04	--	--	--	--	0.01	0.04
14A-E	0.01	0.04	0.01	0.04	0.05	0.1	0.01	0.04	0.01	0.01	0.05	0.09	0.01	0.04
15A-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
16A-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
17A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
18A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
19A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
20A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
21A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
22A-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
23A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
24A-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
25A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
26A-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
1B-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
2B-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
3B-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
4B-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
5B-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
6B-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
7B-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
8B-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
9B-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
10B-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
11B-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
12B-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
13B-E	--	--	--	--	--	--	0.01	0.04	--	--	--	--	0.01	0.04
14B-E	0.01	0.04	0.01	0.04	0.05	0.1	0.01	0.04	0.01	0.01	0.05	0.09	0.01	0.04

15B-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
16B-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
17B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
18B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
19B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
20B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
21B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
22B-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
23B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
24B-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
25B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
26B-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
1C-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
2C-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
3C-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
4C-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
5C-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
6C-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
7C-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
8C-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
9C-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
10C-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
11C-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
12C-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
13C-E	--	--	--	--	--	--	0.01	0.04	--	--	--	--	0.01	0.04
14C-E	0.01	0.04	0.01	0.04	0.05	0.1	0.01	0.04	0.01	0.01	0.05	0.09	0.01	0.04
15C-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
16C-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
17C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
18C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--

19C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
20C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
21C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
22C-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
23C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
24C-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
25C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
26C-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
1D-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
2D-E	1.0	4.0	1.0	4.0	--	--	0.01	0.04	--	--	--	--	--	--
3D-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
4D-E	0.5	2.0	0.5	2.0	--	--	--	--	--	--	--	--	--	--
5D-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
6D-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
7D-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
8D-E	0.01	0.04	0.01	0.04	0.39	1.54	0.38	1.50	0.20	0.80	0.40	1.60	0.01	0.04
9D-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
10D-E	0.50	2.0	0.50	2.0	--	--	--	--	--	--	--	--	--	--
11D-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
12D-E	0.01	0.04	0.01	0.04	2.2	8.8	2.1	8.4	2.66	10.6	2.0	8.0	0.01	0.04
13D-E	--	--	--	--	--	--	0.01	0.04	--	--	--	--	0.01	0.04
14D-E	0.01	0.04	0.01	0.04	0.05	0.1	0.01	0.04	0.01	0.01	0.05	0.09	0.01	0.04
15D-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
16D-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
17D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
18D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
19D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
20D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
21D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
22D-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--

23D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
24D-E	0.10	0.40	0.10	0.40	--	--	--	--	--	--	--	--	--	--
25D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
26D-E	0.05	0.20	0.05	0.20	--	--	--	--	--	--	--	--	--	--
Stock Piles	0.24	1.03	0.12	0.48	--	--	--	--	--	--	--	--	--	--
Haul Rd.	2.32	9.29	0.50	1.92	--	--	--	--	--	--	--	--	--	--
Gen. 1	0.47	0.03	0.47	0.03	16.05	0.89	0.47	0.03	0.27	0.02	3.68	0.21	0.47	0.03
Gen. 2	0.47	0.03	0.47	0.03	16.05	0.89	0.47	0.03	0.27	0.02	3.68	0.21	0.47	0.03
Gen. 3	0.47	0.03	0.47	0.03	16.05	0.89	0.47	0.03	0.27	0.02	3.68	0.21	0.47	0.03
Gen. 4	0.47	0.03	0.47	0.03	16.05	0.89	0.47	0.03	0.27	0.02	3.68	0.21	0.47	0.03
Fire Pump Engine	0.56	0.03	0.56	0.03	7.88	0.44	0.56	0.03	0.52	0.03	1.70	0.10	0.56	0.03
Total	**24.5**	**88.4**	**22.5**	**80.5**	**96.1**	**99.4**	**25.5**	**92**	**26.1**	**97.8**	**39**	**90.9**	**2.76**	**1.43**

Note that annual emissions for all 4 emergency generators and the fire pump engine are based on 110 hours of operation each per year to be representative of an average across all the generators/fire pump engine. The permit will limit hours of operation to a combined 548 hours per year. These emissions are also based on AP-42 table 3.4-1 for the generators and table 3.3-1 for the fire pump engine. Also note that annual emissions from the Liquid Additive Tank Heaters are based on 4,000 hours of operation per year each and the permit will limit those hours of operation accordingly.

REGULATORY APPLICABILITY

The following state and federal regulations apply to the facility:

STATE RULES:

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

The facility is subject to the requirements of §45-2-5 “Control of Fugitive Particulate Matter.” The only requirement under this section is the proscription of any source of fugitive particulate matter “that is not equipped with a fugitive particulate matter control system.”

Each of the Feed Enhancement Reactors (FERs) and Particle Fusion Reactors (PFRs) produce hot exhaust gasses which pass through an air to air heat exchanger which sends hot air to other pieces of equipment in the

facility. Therefore they appear to be indirect heat exchangers subject to 45CSR2.

Per §45-2-3.1 visible emission from the source shall not exceed 10% opacity based on a six minute block average. Because the equipment will use gas volatilized off of the coal as a fuel, and because the emissions will be well controlled with both scrubbers and baghouses, the facility should have no problem meeting this requirement.

§45-2-4.1 limits the amount of PM released into the air. The PFRs under this rule are defined as “type a” sources since the heat they generate will be used to generate steam to produce electricity. The FERs are defined as “type b” sources.

The facility will consist of a total of 8 PFRs each rated at 50 mmbtu/hr for a total of 400 mmbtu/hr. Therefore, the limit under §45-2-4.1.a is 20 pounds per hour. The permit will limit PM emissions from the 8 PFRs to a total of less than 0.1 pound per hour.

The facility will consist of a total of 16 FERs each rated at 4 mmbtu/hr for a total of 64 mmbtu/hr. Therefore, the limit under §45-2-4.1.b is 5.76 pounds per hour. The permit will limit PM emissions from the 16 FERs to a total of less than 0.2 pounds per hour.

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations.

The main requirement of 45CSR7 is the process weight rate based PM stack emission rate in section 4 of the rule. Twenty four point sources at the facility have significant PM emissions.

There are a total of 8 coal dryers at the facility which meet the definition of duplicate source operations. The maximum process weight rate through each dryer is 50 tph for a total of 400 tph. Since the dryers are type a sources, this means that the Rule 7 PM limit is 50 pounds per hour. The permit will limit total PM emissions from the 8 dryers combined to 8 pounds per hour. Therefore, this limit should be met.

There are 24 crushers at the facility which meet the definition of duplicate source operations. The maximum process weight rate through the crushers is a total of 876 tph. Since the crushers are type a sources, this means that the Rule 7 PM limit is 50 pounds per hour. The permit will limit total PM emissions from the 24 crushers combined to 8 pounds per hour.

Note that this is a conservative estimate since some of the emission points that the crushers are vented through contain additional emissions from equipment other than crushers. Therefore, this limit should be met.

The facility is also subject to a twenty (20) percent opacity limit on all process source operations and must have a plan to minimize fugitive emissions. Carbonyx proposes to meet these requirements mainly through the use of baghouses and water sprays.

The facility is also subject to the fugitive particulate matter control systems requirement of section 5.1 of 45CSR7.

45CSR10 To Prevent and Control Air Pollution From the Emission of Sulfur Oxides.

45CSR10 section 4.1 limits the in stack SO_2 concentration to 2,000 ppm. The only sources of SO_2 emissions from the facility are the FERs and PFRs. According to information submitted with the applicants emission calculations, exhaust from the combined FERs and combined PFRs will be approximately 29,000 acfm and 226,000 acfm respectively. Temperatures of the exhaust are approximately 302°F. Total SO_2 emissions from the four FERs will be limited to 0.8 pounds per hour. This yields an in stack SO_2 concentration of approximately 4 ppm. Total SO_2 emissions from the two PFRs will be limited to 5.32 pounds per hour. This yields an in stack SO_2 concentration of approximately 3.41 ppm.

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).

Because emissions from the facility exceed 6 pounds per hour and 10 tons per year of all criteria pollutants, the applicant is required to obtain a Rule 13 permit prior to construction.

45CSR16 Standards of Performance for New Stationary Sources.

The facility is subject to 45CSR16 because it is subject to 40 CFR 60 Subparts Y, IIII, and Dc.

45CSR30 Requirements for Operating Permits.

The facility is subject to 45CSR30 because it is subject to 40 CFR 60 Subparts Y, IIII, and Dc. However, the facility remains a

minor source of all pollutants and therefore will be a deferred source under Title V.

FEDERAL RULES:

40 CFR 60 Subpart Dc Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

The PFRs exhaust to afterburners which combust the off-gases prior to the gas stream passing through a heat recovery system, which converts water to steam via a heat exchanger. Therefore, the afterburners are considered steam generating units under 40 CFR 60, Subpart Dc, and are subject to the requirements of the NSPS. Pursuant to 40 CFR 60.41c, coal-derived synthetic fuels are derived from coal for the purpose of creating useful heat. Although the synthetic gas stream for the PFRs is derived from coal, the synthetic gas stream is not created for the purpose of useful heat. It is, essentially, an impurity that needs to be removed from the raw material in order to produce the finished product. Therefore, the afterburners associated with the PFRs are not subject to the requirements for coal combustion.

Since the affected sources are not subject to the requirements for coal combustion, they are only subject to the reporting and recordkeeping requirements of the rule.

40 CFR 60 Subpart Y Standards of Performance for Coal Preparation and Processing Plants.

Because the dryers will be constructed after May 29, 2009, they are subject to §60.252(b)(1), (b)(2) and (b)(3). §60.252(b)(1)(i) requires that the dryers not exhaust gasses which will contain PM in a concentration of greater than 0.01 grains per dry standard cubic feet nor exhibit opacity greater than 10%. §60.252(b)(2)(iii) exempts sources from the SO_2 requirement of the rule if the dryer receives it's thermal input from a source other than coal or if it receives the input from waste heat. Similarly, §60.252(b)(3)(iii) exempts the dryers from the CO and NO_x standards of the rule. It should be noted that, in the writers opinion, it is somewhat unclear whether Carbonyx qualifies for the exemptions under §60.252(b)(2)(iii) and §60.252(b)(3)(iii) since the fuel comes from coal volatiles and is not waste heat from the "combustion" of coal. However, the Indiana Department of Environmental Management issued a permit for an identical process on August 4, 2010 and in this permit stated that the facility did indeed qualify for the exemptions. During the notice period of the draft permit, USEPA was given the chance to comment on the draft permit and while making other comments (in a July 16, 2010 letter) did not object to this interpretation.

§60.253(b) requires that any pneumatic coal cleaning equipment not emit gasses into the air that contain PM in excess of 0.01 gr/dscf nor exhibit opacity of greater than 5%.

§60.254(b) requires that coal processing and conveying equipment, storage systems and transfer and loading systems not emit gasses into the air that contain PM in excess of 0.01 gr/dscf (from any mechanical vent) nor exhibit opacity of greater than 10% (except for loading, unloading and transfer operations of open storage piles).

§60.254(c) requires the permittee to prepare, submit and operate in accordance with a fugitive dust emission control plan specifically relating to the open stockpiles.

The permittee must perform the testing requirements of §60.255(b) through (f) and (h) using the test methods of §60.257(a) and (b)(1) through (b)(5).

The permittee must perform the reporting and recordkeeping requirements of §60.258.

40 CFR 60 Subpart IIII — Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

The permittee intends to install up to 4 (four) 500kw diesel fired emergency generators and one 190kw emergency fire pump engine. 40 CFR 60 Subpart IIII requires that subject engines meet specific emission standards and fuel specifications. Specifically, the fire pump engine must meet the emission requirements of Table 4 of the Subpart and the emergency generators must meet the emission requirements of §60.4205(b) or (d) as applicable.

It should be noted, that the facility also seems to be subject to 40 CFR 63 Subpart ZZZZ. However, WVDAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. For all practical purposes though, compliance with 40 CFR 60 Subpart IIII should ensure compliance with 40 CFR 63 Subpart ZZZZ.

The proposed modification is **not** subject to the following state and federal rules:

45CSR5 — To Prevent and Control Air Pollution From the Operation of Coal Preparation Plants and Coal Handling Operations.

The facility is not subject to 45CSR5 because it is regulated by 45CSR2.

40 CFR 60 Subpart Kb — Standards of Performance for Volatile Organic Storage Vessels.

Subpart Kb applies to tanks containing volatile organic liquids with a capacity of greater than 75 cubic meters. Carbonyx has stated in their application that all storage tanks to be installed at the facility will have capacities of less than 75 cubic meters.

Therefore, Subpart Kb does not apply.

40 CFR 60 Subpart RRR Standards of Performance for Volatile Organic Compound Emissions Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes.

Subpart RRR applies to reactor processes which produce products, co-products or by-products which are listed in 40 CFR 60.707. The products produced in both the FERs and PFRs are not listed in §60.707. Therefore Subpart RRR does not apply.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The applicant has stated that only "trace" amounts of HAPs will be emitted from the facility. In order to be conservative, the permit will limit HAP emissions from each combustion source to 0.01 pounds per hour and 0.01 tons per year. The permittee will be required to perform appropriate testing to confirm these limits. Emissions of this level will be far under any threshold which would trigger additional regulations.

AIR QUALITY IMPACT ANALYSIS

Because this is a minor source no modeling was performed.

MONITORING OF OPERATIONS

In addition to the monitoring required under NSPS, the permittee will maintain the following records:

* Coal throughput into the facility on a monthly basis
* Cokonyx shipped out of the facility on a monthly basis
* Afterburner temperatures on a daily basis.
* Pressure drop across each baghouse on a daily basis.
* Liquor flow rate into each scrubber on a daily basis.
* pH of the scrubbing liquor into each scrubber on a daily basis.
* Amount of water or chemical solution applied to haul roads and stockpiles on a daily basis.

* Hours of operation of each PFR and FER on a monthly basis.

* Hours of operation of each emergency generator on a monthly basis.

* Hours of operation of the fire pump engine on a monthly basis.

* Total amount of natural gas consumed by the facility on a monthly basis.

* Sulfur content of the feed coal sampled on a monthly basis.

* Volatile content of the feed coal sampled on a monthly basis.

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 R13-2852 for the construction of a "cokonyx" manufacturing facility near Ravenswood, Jackson County, be granted to Carbonyx International USA, Inc.

Steven R. Pursley, PE
Engineer

Date