



west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: 13-3029
Plant ID No.: 073-00029
Applicant: The Ruhlin Company
Facility Name: Willow Island Plant
Location: St. Marys, Pleasants County
NAICS Code: 327320
Application Type: Modification
Received Date: December 18, 2012
Engineer Assigned: Mindy Hendrickson
Fee Amount: \$1,000.00
Date Received: May 14, 2012
Complete Date: January 10, 2013
Applicant Ad Date: December 22, 2012
Newspaper: *Pleasants County Leader*
UTM's: Easting: 471.683 km Northing: 4355.643 km Zone: 17
Description: Applicant proposes the modification and operation of a concrete batch plant. A 4.5 MMBtu/hr liquid petroleum gas fired water heater will be added to the facility. Facility is currently permitted under general permit registration G50-B093.

DESCRIPTION OF PROCESS

Aggregate and sand will be delivered by barge to a dock facility approximately 2,500 feet from the stockpile location. The sand and coarse aggregate will be transferred to dump trucks by clam shell crane and transported to the stockpiles. The stockpiles will be maintained by front end loader. Aggregate (OS-1, OS-2, and OS-3) and sand (OS-4 and OS-5) will be stored on outside storage piles. Watering will be used to suppress dust.

The cement and flyash will be pneumatically transferred from trucks to storage silos (BS-1 and BS-2). The silos are controlled by anti-overfill devices and the central dust collector (APCD-1). All bulk powder storage and transfer points including cement silo (BS-1) and auxiliary silo (BS-2) are controlled by the central dust collector.

For the chilled concrete production, the plant will utilize stockpiles of the three (3) coarse gradations of aggregates that are sprinkled with water to eliminate nearly all aggregate dusting from the loader scoop transfer to the primary feed hoppers. The plant will utilize a volumetric feeding of the three (3) coarse gradations to a wash deck whereby nearly all silt and dust particulate is washed from the coarse aggregate. The aggregate is then transported on a perforated “wet belt” where the temperature is adjusted with a spray of chilled water. Then the aggregate is then rescreened to separate it into the various sizes and to remove most of the remaining water. From the rescreen, the damp, chilled aggregates are transported to the weigh batcher on partially enclosed conveyor belts. The sand for the concrete mixture is chilled (or warmed) with temperature-controlled air, and then transported on a partially enclosed conveyor to the weigh batcher.

All bulk powder storage and transfer points including cement silo, auxiliary silo, weigh batcher, and an enclosed high-intensity mixer (rather than an open drum type of mixer), are provided a state of the art centralized negative dust collector model SOS 6100 from Stephens Mfg. Co. Inc. This dust collector has 18 filter cartridges with a total surface area of 2700 square feet of filter surface and a 20 hp motor to filter 8000 CFM from the cement silo, auxiliary silo, mixer, and weigh batcher. The dust collector also has a reclaim system with a 10 hp motor to return the cement dust from the dust collector filters to the auxiliary 2 silo. The (18) filter cartridges for this dust collector are the Eco 23W pleated Izumi Spunbond Polyester material with 99.95% efficiency for removing particles at 1 micron and above.

Aggregate, sand, cement, flyash, and water are combined in precise volumes in the central mixer. The mixer is an Eagle RCC MAO 1200 twin shaft compulsory mixer with liquid nitrogen injection. The wet concrete is discharged into a hopper and then onto a conveyor to trucks.

The plant is to be enclosed in a fabric structure to attain both passive solar benefits and to further prevent any release of stray dust.

Water will be heated as needed with a newly proposed 4.5 MMBtu/hr Robert Ober & Associates, Inc. liquid petroleum gas fired water heater. The water heater will have a maximum fuel consumption limit of 49.2 gallons per hour and 430,992 gallons per year of liquid petroleum gas.

The Ruhlin Company (Ruhlin) will utilize the following equipment at the Willow Island Plant site:

Table 1: Equipment Summary

Equipment ID No.	Description	Year Installed	Maximum Capacity		Control Equipment
Equipment					
WH-1	Eagle MAO 1200 twin shaft compulsory central mixer	2012	200 tons/hr	480,000 tons/yr	
APCD-1	Stephens SOS 6100 Reverse Pulse Jet Baghouse	2012			
HWH1	Water Heater - 4.5 MBtu/hr Liquified Petroleum Gas (LP) Robert Ober & Associates Inc. RM (2012)	2013	49.2 gal / hr (LP)	430,992 gal / yr (LP)	
Conveyors					
BC-1	Belt Conveyor – Aggregate	2012	180 tons/hr	62,500 tons/yr	PE
BC-2	Belt Conveyor – Aggregate	2012	180 tons/hr	62,500 tons/yr	PE
BC-3	Belt Conveyor – Aggregate	2012	180 tons/hr	62,500 tons/yr	PE
BC-4	Belt Conveyor – Sand	2012	130 tons/hr	34,750 tons/yr	PE
BC-5	Belt Conveyor – Aggregate and Sand	2012	180 tons/hr	62,500 tons/yr	PE
BC-6	Belt Conveyor – Wet Concrete	2012	50 tons/hr	9,300 tons/yr	
Storage			Storage Capacity	Maximum Yearly Throughput	
OS-1	Open Stockpile – Aggregate	2012	31,800 tons	34,500 tons/yr	WS
OS-2	Open Stockpile – Aggregate	2012	22,500 tons	14,500 tons/yr	WS
OS-3	Open Stockpile – Aggregate	2012	22,500 tons	13,200 tons/yr	WS
OS-4	Open Stockpile – Sand	2012	29,500 tons	34,750 tons/yr	WS
OS-5	Open Stockpile – Sand	2012			WS
BS-1	Storage Bin – Cement	2012	100 tons	9,250 tons/yr	FE
BS-2	Storage Bin – Fly Ash	2012	100 tons	4,400 tons/yr	FE

SITE INSPECTION

Because the applications consists only of the addition of a water heater, a site inspection was not deemed necessary. Directions to facility: From I-77 take exit 179 (Parkersburg). Follow State Route 2 north for 10 miles. Turn left onto Fishing Access Road (Willow Island Lock/Dam).

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Potential sources of fugitive particulate emissions from open stockpiles, haulroad surfaces, and aggregate/sand deliveries will be controlled utilizing water sprays. The cement silo and auxiliary silo are both equipped with anti-overfill devices. A centralized negative dust collector, APCD-1, will control all bulk powder storage and transfer points including cement silo, auxiliary silo, weigh batcher, and an enclosed high-intensity mixer. The Stephens SOS 6100 has a reclaim system to return cement dust from the dust collector filters to the auxiliary silo. APCD-1 provides 99.95% controls emissions with a 99.95% efficiency. The plant is to be enclosed with a fabric structure to attain passive solar benefits, in addition to particulate matter control.

A liquid petroleum gas fired 4.5 MMbtu/hr water heater will be utilized by the facility to heat water that is added to the concrete mixture when necessary. The Robert Ober & Associates, Inc. water heater can use up to 49.2 gallons per hour and 430,992 gallons per year of liquid petroleum gas.

Emission calculations were performed by Lori Steele of MSES Consultants, Inc. on behalf of Ruhlin. Calculations for concrete production were performed in application G50-B093 using General Permit G50-B Emissions Calculation Spreadsheet G50ECALC for Concrete Batch Plants. Water heater HWH1 emissions were calculated using emission factors from AP-42 Chapter 1, Section 5.

The proposed maximum controlled emissions for Ruhlin’s concrete batch facility are summarized in the following table:

Table 2: Concrete Production Emissions Summary

Emission Source	Controlled PM Emissions		Controlled PM ₁₀ Emissions	
	lb/hour	TPY	lb/hour	TPY
Fugitive Emissions				
Stockpile Emissions	1.64	7.18	0.77	3.38
Unpaved Haulroad Emissions	14.25	8.51	4.21	2.51
Fugitive Emissions Total	<i>15.89</i>	<i>15.69</i>	<i>4.98</i>	<i>5.89</i>
Point Source Emissions				
Transfer Point Emissions	11.60	1.11	5.33	0.53
Point Source Emissions Total (PTE)	<i>11.60</i>	<i>1.11</i>	<i>5.33</i>	<i>0.53</i>
FACILITY EMISSIONS TOTAL	27.50	16.80	10.31	6.41

Table 3: Water Heater (HWH1) Emissions:

Source ID	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
HWH1	Carbon Monoxide	0.37	1.62
	Nitrogen Oxides	0.64	2.80
	Sulfur Dioxide	0.01	0.04
	Total Particulate Matter	0.03	0.15
	Particulate Matter less than 10 microns	0.03	0.15
	Volatile Organic Compounds	0.05	0.22

Table 4: Total Facility Emissions Summary

Pollutant	Maximum Emissions (Including Fugitives)		Maximum Emissions (NOT Including Fugitives)	
	Hourly (lb/hr)	Annual (tons/yr)	Hourly (lb/hr)	Annual (tons/yr)
Total Particulate Matter	27.53	16.95	11.63	1.26
Particulate Matter Less than 10 Microns	10.34	6.56	5.36	0.69
Carbon Monoxide	0.37	1.62	0.37	1.62
Nitrogen Oxides	0.64	2.80	0.64	2.80
Sulfur Dioxide	0.01	0.04	0.01	0.04
Volatile Organic Compounds	0.05	0.22	0.05	0.22

REGULATORY APPLICABILITY

NESHAPS, NSPS, and PSD have no applicability to the proposed facility. The proposed construction of a ready mix concrete batch plant is subject to the following state rules:

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

The purpose of this rule is to establish limitations for smoke and particulate matter which are discharged from fuel burning units. Per this rule, Section 2.14 defines an indirect heat exchanger as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. Section 2.10 defines a fuel burning unit as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The facility is exempt from sections 4, 5, 6, 8, and 9 because the water heater (4.5 MMBtu/hr) is below 10 MMBtu/hr. The facility will be subject to the opacity requirements in this rule, which is 10% opacity based on a six minute block average.

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

The facility is subject to the requirements of 45CSR7 because it meets the definition of “Manufacturing Process” found in subsection 45CSR7.2.20. The facility will need to be in compliance with Subsection 3.7 -- no visible emissions from any storage structure pursuant to subsection 5.1 which is required to have a full enclosure and be equipped with a control device (storage bins BS-1 and BS-2 are fully enclosed), Subsection 4.1 – PM emissions shall not exceed those allowed under Table 45-7A (see paragraph below), Subsection 5.1 – manufacturing process and storage structures must be equipped with a system to minimize emissions (a baghouse APCD-1 controls emissions from the mixer WH-2, while storage bins BS-1 and BS-2 will be fully enclosed), Subsection 5.2 – minimize PM emissions from haulroads and plant premises (Water sprays will be used when needed for dust control on haul road surfaces and open stockpiles and during aggregate/sand deliveries). All requirements should be met when the particulate matter control methods and devices proposed within applications G50-B093 and R13-3029 are in operation.

According to Table 45-7A, for a type ‘a’ source with a maximum process weight rate of 400,000 lb/hour, the maximum allowable emission rate is approximately 43 lb/hour of particulate matter. The maximum point source emission rate at the facility is 11.63 lb/hour of particulate matter according to calculated emissions in permit application 13-3029.

45CSR10 To Prevent and Control Air Pollution from Emissions of Sulfur Oxides

The purpose of this rule is to prevent and control air pollution from the emission of sulfur oxides. Per this rule, Section 2.9 defines an indirect heat exchanger as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. Section 2.8 defines a fuel burning unit as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. This facility is exempt from sections 3 and 6 because the hot water heater (4.5 MMBtu/hr) is below 10 MMBtu/hr. It is also exempt from section 8 because it combusts natural gas. According to section 4.1., sulfur dioxide concentrations must fall below 2,000 parts per million by volume (included in permit as 4.1.3.(e)).

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

The proposed modification is subject to the requirements of 45CSR13 because the proposed addition of the liquid petroleum gas fired water heater, the facility will no longer be eligible for general permit registration. The proposed modification requires an application to construct. The applicant submitted an application fee of \$1,000. The applicant published a Class I legal advertisement in the *Pleasants County Leader* on December 22, 2012.

45CSR22 Air Quality Management Fee Program

This rule establishes a program to collect fees for certificates to operate and for permits to construct, modify or relocate sources of air pollution. Funds collected from these fees will be used to supplement the Director's budget for the purpose of maintaining an effective air quality management program.

The proposed construction of a ready mix concrete batch plant will NOT be subject to the following state rules:

45CSR14 Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

In accordance with 45CSR14 Major Source Determination, the proposed concrete batch plant is not listed in Table 1. The facility will have a potential to emit 2.80 TPY of a regulated air pollutant (NO_x), which is less than the 45CSR14 threshold of 250 TPY. This St Mary's site is not listed in Table 2, and so fugitive emissions are not included when determining source applicability. Therefore, the proposed construction is not subject to the requirements set forth within 45CSR14.

45CSR30 Requirements for Operating Permits

The facility's potential to emit will be 2.80 TPY of a regulated air pollutant (NO_x), which is less than the 45CSR30 threshold of 100 TPY for a major source.

40CFR63 Subpart JJJJJ

National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Per 63.11195(3), gas-fired boilers as defined in this subpart are exempt. Therefore, the proposed liquid petroleum gas fired water heater is not subject to the requirements set forth within 40CFR63 Subpart JJJJJ.

AIR QUALITY IMPACT ANALYSIS

Air dispersion modeling was not performed due to the size and location of this facility and the limit of the proposed construction permit. This facility will be located in Pleasants County, WV, which is designated attainment for PM_{2.5} (particulate matter less than 2.5 microns in diameter). The facility is a minor source and not subject to 45CSR14.

MONITORING OF OPERATIONS

Maximum concrete production, liquid petroleum gas usage, and visible emissions will be monitored:

- 4.2.1. For the purpose of determining compliance with maximum throughput and emission limits set forth in 4.1.1. and 4.1.2., the permittee shall monitor concrete production and maintain certified daily records. An example form is included as Appendix A. Such records shall be retained onsite by the permittee for at least five (5) years. Certified records shall be made available to the Director or his duly authorized representative upon request.
- 4.2.2. For the purpose of determining compliance with the maximum fuel usage limits set forth in 4.1.3. and 4.1.4., the permittee shall maintain monthly liquified petroleum fuel records for the 4.5 MMBTU/hr water heater HWH1 utilizing the form identified as Appendix C.
- 4.2.3. For the purpose of determining compliance with the opacity limits of 45CSR§2 and 45CSR§7, the permittee shall conduct visible emission checks and / or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit.
 - a. The visible emission check shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40CFR Part 60, Appendix A, Method 22 or from the lecture portion of the 40CFR Part 60, Appendix A, Method 9 certification course.
 - b. Visible emission checks shall be conducted at least once per calendar month with a maximum of forty-five (45) days between consecutive readings. These checks shall be performed at each source (stack, transfer point, fugitive emission source, etc.) for a sufficient time interval, but no less than one (1) minute, to determine if any visible emissions are present. Visible emission checks shall be performed during periods of facility operation and appropriate weather conditions.
 - c. If visible emissions are present at a source(s) for three (3) consecutive monthly checks, the permittee shall conduct an opacity reading at that source(s) using the procedures and requirements of Method 9 as soon as practicable, but within seventy-two (72) hours of the final visual emission check. A Method 9 observation at a source(s) restarts the count of the number of consecutive readings with the presence of visible emissions.

CHANGES TO PERMIT G50-B093

A 4.5 MMBtu/hr liquid petroleum gas fired water heater will be added. Because the water heater is subject to 45CSR2 and 45CSR10, the facility will no longer be eligible for the G50-B general permit registration. Ruhlin's current permit registration, G50-B093, is being converted to a Rule 13 permit with the addition of the water heater.

RECOMMENDATION TO DIRECTOR

The information contained in this modification application indicates that compliance with all applicable regulations should be achieved when all proposed particulate matter control methods are in operation. Due to the location, nature of the process, and control methods proposed, adverse impacts on the surrounding area should be minimized. Therefore, the granting of permit 13-3029 to The Ruhlin Company for the modification of a concrete batch plant located in St. Marys, Pleasants County, WV is hereby recommended.

Mindy Hendrickson
Permit Writer

June 7, 2013

Date