



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3389
Plant ID No.: 039-00677
Applicant: Byrd of Pray Creations, LLC (BOP)
Facility Name: St. Albans
Location: 691 Austin Dr., St. Albans, Kanawha County
NAICS Code: 3813
Application Type: Construction
Received Date: October 27, 2017
Engineer Assigned: John Legg
Fee Amount: \$1,000.00
Date Received: October 27, 2017
Complete Date: December 21, 2017
Due Date: March 21, 2018
Applicant Ad Date: November 15, 2017 (advertised VOC emissions too big) and
December 14, 2017 (affidavit of publication received 12/21/17)
Newspaper: *The Charleston Gazette*
UTM's: Easting: 423.81 km Northing: 4,250.15 kn Zone: 17
Description: Construction permit for a facility that abrasive blasts metal parts
and occasionally paints them.

SUMMARY

The application was first received on October 17, 2017, but was returned for several deficiencies: no business registration certificate, no process description, no process flow diagram, no plot plan, no air pollution control device sheets, no calculations, and no MSDS sheets.

On October 27, 2017, BOP re-submitted the application to construct a sandblasting and painting facility. The \$1,000.00 application fee was paid on October 27, 2017. The company's legal ad ran in *The Charleston Gazette* on November 15, 2017 and was re-run on December 14, 2017, because of an error with VOC emissions being listed too high (1,356 TPY instead of 13.56 TPY). There were no public comments resulting from either of the Company's legal notices. Potential emissions are estimated to be: PM10 = 1.5 TPY; PM = 3.2 TPY; VOC = 13.56 TPY; Total HAPs = 7.61 TPY; Xylene = 5.51 TPY; Ethylbenzene = 0.63 TPY; Toluene = 0.63 TPY and Methyl Isobutyl Keytone (MIBK) = 0.85 TPY.

DESCRIPTION OF PROCESS

From Attachment G of permit application, page 7 is BOP’s process description:

Building is used to abrasive blast metal parts and occasionally paint them. Metal is brought into abrasive blast room (1S) and blasted, then if needed is taken to the paint area (2S) and painted, then loaded on truck to take back to customer.

From Attachment M of the permit application, “Blast Bay Collector Info”:

All blasting material is contained on a concrete floor in the Blast Bay/Room for reuse until it is no longer usable. Then it is disposed of through Safety Kleen.

Table 1 : Abrasive Blast Room (1S) PM/PM10 Collector (1C).	
Manufacturer:	Self-manufactured by Byrd of Pray Creations, LLC.
Method/Type of Collector:	Silo-type (long) wet collecting system
Exhaust Fans:	<p>Uses three (3), 18 inch Global Industrial exhaust fans to force particulate laden air from the blasting bay into a silo type collector located outside the building.</p> <p>The 3 fans are located in the North wall of the building, after the pre-inlet dust filter box which is located inside the building. The pre-inlet dust filter box is 54" wide X 30" thick X 60" in height.</p> <p>The 3 fans and the pre-inlet dust filter box are located high (16 feet) above the concrete floor.</p>
Info about Silo Portion of Collector:	The exhausted air from the pre-inlet filter box blows into a sealed silo type duct/collector located on the outside of the North building wall. The silo type collector is 54" wide X 36" thick X 125" (10 ft 5 in.) in height.
Dust Catching Water Basin Tank:	<p>At the bottom of the silo type portion of the collector is a removable 300 gallon water, dust catch basin tank. The bottom of the water catch basin sits at ground-level.</p> <p>The air containing particulate matter travels through the silo to below the water level in the catch basin tank and must work its way back through the water to the top of the catch basin tank before exiting into the air. The particulate matter is caught/left in the water in the catch basin.</p>
Disposal of Solids:	Safety Kleen is used to dispose of the solids left behind in the catch basin.

Table 1 : Abrasive Blast Room (1S) PM/PM10 Collector (1C).	
PM Removal Efficiency:	80% (based on emission calculations/Attachment J: "Emission Points Data Summary Sheet")
Monitored	Daily checks.
Record-keeping and Reporting	Weekly
Testing	Upon Request.

Table 2 : Paint Area (2S) Filter (2C).	
Manufacturer:	Self-manufactured by Byrd of Pray Creations, LLC.
Method/Type of Collector:	Filter Box containing three (3) or four (4) bi-fold tacky filters.
Exhaust Fan:	<p>Uses one, 36" exhaust fan mounted in the North wall to force particulate laid paint fumes from the Paint Area (2S) through the Filter Box located inside the building through to the fan located in the wall through to the outside air.</p> <p>The filter box is 48" wide X 36" thick X ? (at least 36") in height.</p> <p>The filter box are located high (14 feet above) the concrete floor.</p>
Info on Bi-Fold Filters	Manufacturer Part Number 0552048 and 0155204810. Manufacturer in United States. Part Brand FSS.
Disposal of Filters	Safety Kleen to pick up.
PM Removal Efficiency:	90% efficient (based on emission calculations/Attachment J: "Emission Points Data Summary Sheet")
Monitored	Check and clean weekly.
Record-keeping and Reporting	Date and condition recorded weekly.
Testing	Upon request.

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MSDS SHEETS

BOP submitted six MSDS's for coating, three MSDS's for abrasive blasting materials, and two MSDS for solvents/thinners. They are summarized below:

Carboguard 890 Part A	Cycloaliphatic Amine Epoxy - for industrial use only
Carboguard 890 Part B	Cycloaliphatic Amine Epoxy - for industrial use only
3.5 VOC Epoxy Primer (Part A), Gray	Manufacturer: Sherwin-Williams Company; A two-component primer offering very good corrosion resistance over properly cleaned CRS and aluminum substrates. This primer is recommended for use on agricultural and construction OEM equipment, related attachments and accessories, trailers and general metal markets.
3.5 VOC Epoxy Primer Activator (Part B)	
Xylenes (o-, m -, and p- isomers)	Solvent/thinner. 100% VOC/HAP
Mineral spirits	Solvent/thinner. 100% VOC
Bar-Rust 235, Surface Tolerant Epoxy	Devoe High Performance Coatings. A high performance, multi-purpose, surface tolerant, two-component chemically-cured epoxy semi-gloss coating. Mixing: Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied.
Bar-Rust 235, Base Neutral Tint Part A	
3-Mix-Processed Glass Abrasive	Abrasive blasting media/material. 100% by weight glass oxides of silicon, calcium, sodium, aluminum, iron, magnesium, and/or potassium.
Hold*Blast (Surface Passivator & Soluble Salt Remover)	Chemically changes the active surface of metal to a much less reactive state. This product passivates the surface to stop the formation of surface rust for several days.
GlassBlast - Crushed Glass Abrasive Media	Amorphous Silica, Soda-lime Glass, Glass Oxide or Silicon Dioxide

SITE INSPECTION

BOP was last inspected by Andy Grimm, DAQ Enforcement Inspector, on December 20, 2017. The facility was found to be out of compliance for sandblasting and painting without an air permit. Prior to this, BOP had been warned in October and May of 2017 by Andy Grimm not to sandblast or paint without obtaining a permit. BOP worked with Gene Coccari of the DAQ's Small Business Assistance Program to submit a permit application.

Directions to the facility as given in permit application are as follows: From Rt 60/Rt 35 intersection, proceed west for approximately one mile. Austin Drive is a sharp right turn off. 691 is the first building on the right.

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ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Gene Coccari of DAQ's Small Business Assistance Program worked with BOP to estimate emissions from the Abrasive Blast Room (1S) and Paint Area (2S). These emissions are discussed and summarized below in Tables 3, 4, and 5.

Abrasive Blast Room (1S) PM/PM10 Emissions

BOP assumed they used 1 MM lb/yr of abrasive blast material. According to AP-42, Table 13.2.6-1., the PM emission factor (at 5 mph wind speed) is 27 lb/1,000 lb of abrasive blast material used.

$$1\text{MM lb/yr} \times 27 \text{ lb/1,000 lb} = 27,000 \text{ lb} = 13.5 \text{ ton/yr}$$

BOP assumed that they would blast 40 hr/wk x 52 wk/yr = 2,080 hr/yr:

$$13.5 \text{ ton/yr} \times 2,000 \text{ lb/ton} \times 1 \text{ yr/2,080 hr} = 13 \text{ lb/hr}$$

Table 3: PM/PM10 Emissions BOP's Abrasive Blast Room (1S).				
Pollutant	Abrasive Blast Room (1S)			
	Uncontrolled		Controlled⁽¹⁾	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
PM	13	13.5	2.6	2.7
PM ₁₀	6.25	6.5	1.25	1.3
<small>(1) The PM/PM10 control efficiency of the Abrasive Blast Room PM/PM10 Collector (1C) is 80%.</small>				

Paint Area (2S) PM/PM10 & VOC/HAP Emissions

PM/PM10 Emissions

Hourly PM Emissions

BOP assumed that they could spray paint a maximum of 11.6 gal/hr of Carboguard 890 coating containing 10.8 lb/gal of solids.

Worst Case

Hourly PM emissions: 11.6 gal/hr X 10.8 lb/gal = 125 lb/hr of PM

Annual PM Emissions

BOP calculated (using the PM spreadsheet in Attachment N of the application) that they would spray 6,000 gallons of various coatings per year containing a total of 28.8 tons of PM.

The transfer efficiency of the paint to the object being painted was assumed to be 30% and it was assumed that 80% of the paint remaining in the air settled out in the paint area, i.e., the settling chamber efficiency was 80%.

Thus the annual PM emissions before passing through the paint area filters was calculated to be:

$$\begin{aligned} \text{Annual PM emissions} &= 28.8 \text{ ton/yr} \times (1 - 0.3) \times (1 - 0.8) \\ \text{(Before paint area filters)} &= 4.03 \text{ ton/yr} \end{aligned}$$

Assuming the paint area filters to be 90% efficient, the annual controlled PM emissions from the paint area would be:

$$4.03 \text{ ton/yr} \times (1 - 0.9) = 0.403 \text{ ton/yr}$$

Table 4: PM/PM10 Emissions from BOP's Paint Area (2S).				
Pollutant	Paint Area (2S)			
	Uncontrolled		Controlled ⁽¹⁾	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
PM	125 ⁽²⁾	4.03 ⁽³⁾	12.5	0.403
PM ₁₀	62.5	2.0	6.25	0.20
<p>(1) The PM/PM10 control efficiency of the Paint Area filters is 90%..</p> <p>(2) Worst case hourly PM is based on spraying 11.6 gal/hr of Carboguard 890 coating containing 10.82 lb/gal of solids.</p> <p>(3) The annual uncontrolled ton/yr value of 4.03 is emissions before control by the Paint Area filter, but it is calculated by assuming a transfer efficiency of 30% and a settling chamber efficiency of 80% before being controlled by the Paint Area filter.</p>				

VOC/HAP Emissions

Hourly VOC Emissions

BOP assumed that they could spray paint a maximum of 10 gal/hr of Xylene containing 100% xylene (7.2 lb/gal).

Worst Case
Hourly VOC/HAP
Emissions: $10 \text{ gal/hr} \times 7.2 \text{ lb/gal} = 72 \text{ lb/hr of VOC}$

Annual VOC/HAP Emissions

BOP calculated (using the VOC and HAP spreadsheets in Attachment N of the application) that they would spray 8,000 gallons of various coatings/thinner/solvents per year containing a total of 13.56 tons of VOCs and 7.61 tons of HAPs.

Table 5: VOC/HAP Emissions from BOP's Paint Area (2S).					
Pollutant		Paint Area (2S)			
		Uncontrolled		Controlled	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC		72	13.56	72	13.56
HAPs	Xylene	72 ⁽¹⁾	5.51	72	5.51
	Ethyl-benzene	6.25	0.63	6.25	0.63
	Toluene	6.25	0.63	6.25	0.63
	MIBK	8.4	0.85	8.4	0.85
Total HAPs		72 ⁽¹⁾	7.61	72	7.61
(1) Worst case hourly HAP emissions is based on spraying approximately 10 gal/hr of xylene.					

Total PM/PM10 from Facility

The PM/PM10 emissions from Tables 4 and 5 were added together to get the total PM/PM10 emissions from BOP facility.

Table 6: PM/PM10 Emissions from BOP's Facility [Abrasive Blasting (1S + Paint Area (2S))]					
Pollutant		Uncontrolled		Controlled	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Abrasive Blast Room (1S)	PM	13	13.5	2.6 ⁽¹⁾	2.7 ⁽¹⁾
	PM ₁₀	6.25	6.5	1.25 ⁽¹⁾	1.3 ⁽¹⁾
Paint Area (2S)	PM	125	4.03	12.5 ⁽²⁾	0.403 ⁽²⁾
	PM ₁₀	62.5	2.0	6.25 ⁽²⁾	0.20 ⁽²⁾
Facility Total	PM	138	17.53	15.1	3.11
	PM ₁₀	68.75	8.5	7.50	1.50
(1) The PM/PM10 control efficiency of the Abrasive Blast Room PM/PM10 Collector (1C) is 80%.					
(2) The PM/PM10 control efficiency of the Paint Area filters is 90%.					

REGULATORY APPLICABILITY

The facility is a minor source for criteria pollutants, and HAPs.

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

Rule 7 applies to particulate matter emissions from the following equipment:

- The **Abrasive Blast Room (1S)**. PM/PM10 emissions to the atmosphere are controlled by the Abrasive Blast Room Collector (C1) which has a removal/control efficiency of 80%.
- The **Paint Area (2S)**. PM/PM10 emissions to the atmosphere are controlled by the Paint Area Filter (2C) which has a PM/PM₁₀ emission removal/control efficiency of 90%.

Applicable Sections of 45CSR§7 quoted in the permit are:

- 45CSR§7-3.1 - Opacity limit (> 20% opacity), quoted in permit Sections 6.1.4 and 7.1.11;
- 45CSR§7-4.1 - Calculate PM lb/hr limit, quoted in permit Section 6.1.5;
- 45CSR§7-5.1 - Control system for fugitive emissions, quoted in permit Sections 6.1.6 and 7.1.12;
- 45CSR§7-8.1 - PM testing of exhaust gases, quoted in permit Sections 6.1.7 and 7.1.13.
- 45CSR§7-8.2 - Testing by the Director, quoted in permit Section 6.1.8 and 7.1.14.
- 45CSR§7-9.1 - Application to Director for malfunctions, quoted in permit Section 6.1.9 and 7.1.15.

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

This application is for construction of an abrasive blast and painting facility.

In May of 2017, BOP was referred to and worked with Gene Coccari of the DAQ's Small Business Assistance Program to put together the necessary paperwork to obtain a Rule 13 air permit. The first application was first received at the DAQ on October 17, 2017 and was returned on October 19, 2017 because of several deficiencies (see Summary above). The application was re-submitted on October 27, 2017. The legal advertisement for the application was run on November 15, 2017 and because of an error in the advertisement (too high VOCs: 1,356 TPY) was re-run on December 14, 2017. The legal advertisement's affidavit of publication was received at the DAQ on December 21, 2017.

45CSR21 - Regulation to Prevent and Control Air Pollution From the Emission of Volatile Organic Compounds

This facility is located in Kanawha County which is subject to Rule 21, Section 19, "Coating of Miscellaneous Metal Parts"

- Section 19, "Coating of Miscellaneous Metal Parts"

BOP's Paint Area (2S) is used to refinish metal parts. Per 19.3.a. the permittee shall limit the VOC content of coatings used to 3.5 lb/gal as applied.

- Section 40, "Other Facilities that Emit Volatile Organic Compounds (VOC)"

BOP's facility will emit less than the Section 40. threshold applicability of aggregate maximum theoretical emissions of 90.7 megagrams (mg) (100 tons) or more of VOCs per calendar year in the absence of control devices.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

See MSDS Sheets in application.

AIR QUALITY IMPACT ANALYSIS

No air quality impact analysis was conducted for this application.

MONITORING OF OPERATIONS

- Maintenance and malfunction records are to be kept for all control equipment. See Section 3 of R13-3338 for additional information.
- The following records are to be kept for the Paint Area (2S) and Abrasive Blast Room (1S). See Section 5 of R13-3338 for additional information.
 - Monthly records:
 - Abrasive Blast Room (1S)
 - opacity/visible emission check
 - annual/12-month rolling abrasive blasting material addition/replacement (lb/yr)

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Paint Area (2S)

- opacity/visible emission check
- total monthly VOC and HAP emissions (lb)
- average hourly VOC and HAP emissions (lb)
- annual/12-month rolling VOC and HAP emission total (lb/yr)

- Daily records:

Abrasive Blast Room (1S):

- number of hours abrasive blasting took place (hr)
- amount of blast material used (lb)
- amount/pounds of blast added and/or replaced, if any (lb)
- filter replacement information (name and number of replacement filters), if needed,
- silo collector water replacement and/or solids removal and/or any other maintenance work performed, if needed

Paint Area (2S):

- date and duration/number of hours painting took place (hr)
- name/ID and amount of each coating applied (gal or lb)
- name/ID and amount of solvent/thinner added to each coatings applied, if needed (gal or lb)
- name/ID and amount of each solvent/thinner used for cleanup activities (gal or lb)
- filter replacement information (name & number of replacement filters) and/or any other maintenance work performed, if needed

RECOMMENDATION TO DIRECTOR

The writer has reviewed permit application R13-3389 and believes that compliance with all applicable regulations can be achieved. Therefore, the writer recommends that Permit R13-3389 be granted to Bird of Pray Creations, LLX. for the construction of an abrasive blasting and painting facility at 691 Austin Dr, St. Albans, Kanawha County, WV.

John Legg
Permit Writer

February 15, 2018

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