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**west virginia** department of environmental protection

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## **ENGINEERING EVALUATION / FACT SHEET**

### BACKGROUND INFORMATION

Application No.: R13-3115  
Plant ID No.: 079-00179  
Applicant: Mountaineer Fabricators, Inc.  
Facility Name: Nitro Facility  
Location: Putnam County  
NAICS Code: 332996  
Application Type: Construction  
Received Date: August 23, 2013  
Engineer Assigned: Steven R. Pursley, PE  
Fee Amount: \$1,000.00  
Date Received: August 26, 2013  
Complete Date: September 23, 2013  
Due Date: December 23, 2013  
Applicant Ad Date: August 27, 2013  
Newspaper: *The Charleston Gazette*  
UTM's: Easting: 426.725 km    Northing: 4,254.419 km    Zone: 17  
Description: After the fact installation of a blast/paint shop.

### DESCRIPTION OF PROCESS

Material is received from the nearby weld shop. Upon entering the paint/blast facility, the steel fabricated materials are staged to be blasted. Blast dust is removed by a pneumatic dust collection system to a baghouse.

After blasting, the materials are moved to the paint area for coatings to be applied as specified by the customer. Painting is performed using a network of dual filtered vent units. The dual filtration system is made up of an "Air Flow Technology Series 99 Overspray Exhaust Media" and a Kem Wove #12-011 filter. Filters are monitored by Charleston Filter and replaced as needed. The materials are allowed to dry in place and then loaded on trucks for delivery.

## SITE INSPECTION

A site inspection of the area was performed by the writer on November 20, 2013. The facility is located in a primarily industrial area although there are a couple residences adjacent to the facility and commercial buildings nearby. To get to the facility take I-64 west to exit 45. Turn left on State Route 25 and go 0.7 miles and turn right on Pickens Rd. Go 0.1 miles and turn right on McJunkin Road. Go approximately 400 feet and the facility is on the left. Pictures of the facility taken by the writer follow (front and back of building):



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Mountaineer Fabricators, Inc.  
Nitro Facility

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

All VOC and HAP emissions are based on a simple mass balance assuming all VOCs/HAPs from all substances are emitted to the atmosphere. This methodology utilized specific usages of each particular coating/stain/solvent. However, in order to give maximum flexibility while ensuring compliance with the annual emission limits, the permit will simply limit the amount of each HAP used along with total VOCs used. Hourly emissions are based on the material with the highest VOC content and a maximum 10 gallons per hour of material (in this case lacquer thinner) used

PM emissions from the coating operations were based upon a mass balance approach. For each given coating the solids content was obtained and then a transfer efficiency of 30% and a settling chamber efficiency of 80% was assumed. Hourly emissions were based on the coating with the highest solids content and a maximum 10 gallons per hour of paint used. In order to be overly conservative all PM emissions are assumed to be PM<sub>2.5</sub>.

PM emissions from the Abrasive Blasting booth used AP-42 controlled emission factors from Chapter 13.2.6. Annual emissions are based on 90,000 pounds of abrasive used per year (will be limited to that amount in permit). Hourly emissions are based on a conservative 1,000 hours per year.

	PM/ PM <sub>10</sub> /PM <sub>2.5</sub>		VOCs	
	lb/hr	tpy	lb/hr	tpy
Coating Area	3.67	10.60	57.4	20.35
Abrasive Blast Booths	0.07	0.04	--	--
<b>Total</b>	<b>3.74</b>	<b>10.64</b>	<b>57.4</b>	<b>20.35</b>

HAP emissions from the facility (coating area) will be limited to the following (no controls):

HAP	lb/hr*	tpy
Xylene	48	7.17
Toluene	78	4.99
Naphthalene	1.4	0.05
Benzene	12	0.29

MIBK	21.51	1.31
Hexamethylene Diisocyanate	1.08	0.05
Formaldehyde	1.76	0.08
Methanol	39	2.33
Ethylbenzene	12	1.63
<b>Total HAPs*</b>	<b>117.00</b>	<b>17.90</b>

\*Hourly rates based on using 10 gallons per hour (which is the maximum physically possible at the facility) of the substance with the highest content of the particular HAP. Total hourly emissions is not the sum of the individual emissions because all of the different coatings/stains/solvents cannot be used at the same time. Instead it is the emission rate assuming 10 gallons per hour of lacquer thinner (material with highest total HAP content (7.8 lb/gal toluene, 3.9 lb/gal methanol) is being used.

#### REGULATORY APPLICABILITY

The following state and federal regulations apply to the facility:

##### STATE RULES

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. As can be seen in the table below the sources meet this requirement.

Source	Permit Limit (lb/hr)	Rule 7 Limit (lb/hr)
Coating Area	3.67	28.00
Abrasive Blast Booths	0.07	10.00

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. The applicant proposes to meet these requirements through the use of enclosures and baghouses.

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

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 uncontrolled PM and VOC emissions from the facility will exceed 6 pounds per hour and 10 tons per year and because HAP emissions from the facility will exceed 2 pounds per hour and 5 tons per year, the facility is required to submit a construction permit application under 45CSR13. Additionally, the facility is subject to several substantive rule requirements (as outlined in this section). Because this permit is a synthetic minor for HAPs, (Rule 34) "notice level C" is required. The facility will be a synthetic minor mainly because the facility would be major without the usage limits proposed in the application and that will be required in the permit. Those usage limits will also make the facility a synthetic minor source for HAPs under Title V.

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

Because the facility will be located in Putnam County and coats "Miscellaneous Metal Parts", it is subject to §45-21-19. The main requirement of the rule (that is applicable to the facility) is the VOC content limit of §45-21-19.3.a.3. This limits the VOC content of any coating used to 3.5 pounds per gallon. The facility uses a few coatings that do not meet this limit, however, §45-21-19.4 allows the facility to comply with the rule by using a daily-weighted average.

45CSR22 Air Quality Management Fee Program

The facility's potential to emit will be less than the 45CSR30 threshold of 100 TPY for any criteria pollutant and will be less than 10 tons per year of any individual HAP and less than 25 tons per year of all combined HAPs by taking a synthetic minor limitation. Additionally, no NSPS or MACT appears to apply to the facility. Therefore, the facility will not be subject to 45CSR30. Since it is not subject to 45CSR30, it is subject to 45CSR22.

#### NON-APPLICABILITY DETERMINATION

The facility is potentially subject to 40 CFR 63 Subpart HHHHHH should it begin using coatings that contain one of the rules targeted HAPs (currently they do not use any coatings containing any of those HAPs). However, WV has not accepted delegation of this area source GACT and has no plans to accept delegation in the near future.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The following Hazardous Air Pollutants will be emitted from the facility (all information comes directly from EPA's Air Toxics Website):

### **Xylene**

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

### **Toluene**

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

### **Naphthalene**

Naphthalene is used in the production of phthalic anhydride; it is also used in mothballs. Acute (short-term) exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to

naphthalene by inhalation and ingestion. Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Hemolytic anemia has been reported in infants born to mothers who "sniffed" and ingested naphthalene (as mothballs) during pregnancy. Available data are inadequate to establish a causal relationship between exposure to naphthalene and cancer in humans. EPA has classified naphthalene as a Group C, possible human carcinogen.

## **MIBK**

Methyl isobutyl ketone is used as a solvent for gums, resins, paints, varnishes, lacquers, and nitrocellulose. Acute (short-term) exposure to methyl isobutyl ketone may irritate the eyes and mucous membranes, and cause weakness, headache, nausea, lightheadedness, vomiting, dizziness, incoordination, narcosis in humans. Chronic (long-term) occupational exposure to methyl isobutyl ketone has been observed to cause nausea, headache, burning in the eyes, weakness, insomnia, intestinal pain, and slight enlargement of the liver in humans. Lethargy and kidney and liver effects have been observed in rats and mice chronically exposed by gavage (experimentally placing the chemical in the stomach), ingestion, and inhalation. EPA has classified methyl isobutyl ketone as a Group D, not classifiable as to human carcinogenicity.

## **Methanol**

Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Exposure may occur from ambient air and during the use of solvents. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation or ingestion may result in blurred vision, headache, dizziness, and nausea. No information is available on the reproductive, developmental, or carcinogenic effects of methanol in humans. Birth defects have been observed in the offspring of rats and mice exposed to methanol by inhalation. EPA has not classified methanol with respect to carcinogenicity

## **Hexamethylene Diisocyanate**

Hexamethylene diisocyanate is used as a polymerizing agent in polyurethane paints and coatings. Acute (short-term) exposure to high concentrations of hexamethylene diisocyanate in humans can cause pulmonary edema, coughing, and shortness of breath. Hexamethylene diisocyanate is also extremely irritating to the eyes, nose, and throat. Human studies have suggested that chronic (long-term) exposure to hexamethylene diisocyanate may cause chronic lung problems. Animal studies have reported respiratory effects from chronic inhalation exposure and skin irritation and sensitization from dermal exposure to hexamethylene diisocyanate. No information is available on the reproductive, developmental, or carcinogenic effects of hexamethylene diisocyanate in humans. EPA has

not classified hexamethylene diisocyanate for carcinogenicity.

## **Formaldehyde**

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

## **Ethylbenzene**

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

## **Benzene**

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

## AIR QUALITY IMPACT ANALYSIS

Since this is a construction of a minor source as defined in 45CSR14, no modeling was performed.

## MONITORING OF OPERATIONS

The permit will require Mountaineer Fabricators, Inc. to monitor and record the following:

- \* VOC content of each coating/stain/solvent used.
- \* Type and amount of HAP in each coating/stain/solvent used.
- \* Amount of each coating/stain/solvent used (on a daily basis).
- \* The amount of abrasive used in the Abrasive Blasting Booths.
- \* Monthly visible emission checks of the baghouses.

## 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 R13-3115 for the construction of the Nitro Facility in Putnam County, be granted to Mountaineer Fabricators, Inc.

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Steven R. Pursley, PE  
Engineer

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November 12, 2013

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