west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET
BACKGROUND INFORMATION

Application No.:	R13-3325
Plant ID No.:	045-00153
Applicant:	HUNTINGTON STEEL AND SUPPLY COMPANY
Facility Name:	Holden, West Virginia Plant
Location:	Holden, Logan County, WV
NAICS Code:	423510
Application Type:	Construction
Received Date:	May 31, 2016
Engineer Assigned:	Thornton E. Martin Jr.
Fee Amount:	$1,000.00
Date Received:	June 01, 2016
Complete Date:	June 24, 2016
Newspaper:	*Logan Banner*
Applicant Ad Date:	June 08, 2016
UTMs:	Easting: 407.259 km Northing: 4,186.886 km Zone: 17
Description:	Permit for the construction of an abrasive blasting and painting facility for metal parts.

DESCRIPTION OF PROCESS

HUNTINGTON STEEL AND SUPPLY COMPANY is proposing to convert one of their existing steel warehouses into an abrasive blasting and painting area. The warehouse will be sectioned off into three areas: a staging room, an abrasive blasting room and a paint room.

The following are the identified emission sources (proposed) at the facility:

Paint Operation
Equipment – Paint Room (1S)

The spray paint process will apply a surface coating onto miscellaneous steel parts. Utilizing an airless spray gun (Graco XTR 7), the paint is atomized and emitted from the nozzle of the spray gun onto the part or parts. Due to the nature of the process, some paint is introduced into the ambient air known as spray off. The spray off is collected using a ventilation fan drawing the atomized paint into a fiberglass filter (1C) meeting the regulatory standards for paint booth operations (EPA, NFPA #33, OSHA #1910.107) and the Maximum Achievable Control Technology requirements with West Virginia State Regulation (45CSR13). The entire process is enclosed within a room and all spray off is collected within the control technology (fan and filter). All coatings and solvents have been identified and documentation included with the Application.

HUNTINGTON STEEL AND SUPPLY COMPANY receives parts from numerous suppliers which are stored in the staging area. The primary materials that are used for coating the metal parts are as follows: LORD Chemlok® 220 adhesive is a covercoat adhesive designed for use over Chemlok 205 primer. This adhesive system will bond a wide variety of elastomers such as natural rubber (NR), styrene-butadiene (SBR), polychloroprene (CR), nitrile (NBR) and polyisoprene (IR) to various metals and other rigid substrates during vulcanization of the elastomer. It is composed of a mixture of polymers, organic compounds and mineral fillers dissolved or dispersed in an organic solvent system. It is estimated that 2500 gallons of each coating will be utilized annually. The solvent used to thin Chemlock 220 / Chemlock 205 and / or cleanup equipment will be Methyl Ethyl Ketone (MEK). It is estimated that 1250 gallons of MEK will be utilized annually.

Mechanical Cleaning
Equipment – Abrasive Blasting (2S)

Grit blasting is the most widely used method of mechanical cleaning. However, machining, grinding or wire brushing can be used. Use of steel grit is used to blast clean steel, cast iron and other ferrous metals. Use of aluminum oxide, sand or other nonferrous grit is used to blast clean stainless steel, aluminum, brass, zinc and other nonferrous metals.

HUNTINGTON STEEL AND SUPPLY COMPANY will utilize VBlast. VBlast is a brown fused aluminum oxide. VBlast is comprised of Aluminum Oxide (>90% M/W), Silicon Fused (<5% M/W), Titanium Dioxide (<5% M/W), Iron Oxide (<5% M/W) and Titanium Dioxide (<5% M/W). VBlast will be replenished as needed. It is estimated that 100,000 pounds of VBlast will be utilized annually.

SITE INSPECTION

This will be a new source and as such will be placed in the appropriate category for periodic inspections by the Compliance and Enforcement Section of the Division of Air Quality. Based on the size and scope of the facility proposed, a site inspection by the writer was deemed unnecessary at this time.

Take the exit for Copperas Fork Road from State Route 119 South. Turn left onto Copperas Fork Road then turn right onto Trace Avenue. From Trace Avenue, turn left onto Old Delta Road. From Old Delta Road, turn left onto Lyman Terrace. From Lyman Terrace, turn right into the Business Park.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions generated at this facility are mainly from applying surface coatings, the parts blasting room, and cleaning activities. The pollutants emitted are particulate matter and VOCs, which include hazardous air pollutants (HAPs).

VOC estimates from the paint room at this facility are determined by using a mass balance approach and assuming that all of the VOCs in the coating were emitted. To estimate the annual VOC emissions, it is assumed that the operation will use 2,500 gal/yr of Chemlok 205 and Chemlok 220 each and 1,250 gal/yr of MEK (solvent). The maximum annual particulate emissions (PM) were based on the coating PM content (lb/gal), annual coating usage (gal/yr), transfer efficiency of 45% and settling chamber efficiency of 80%. Maximum annual HAP emissions are based on the percent by weight of the HAPs present in the materials, usage rates of 2,500 gal/yr of Chemlok 205 and Chemlok 220 each and 1,250 gal/yr of MEK (solvent), and the unit weight of the specific material (density). Hourly emissions are not based on the average hourly rate but a spike use of 5 gallons per hour for each material.

The PM, PM_{10}, & $PM_{2.5}$ emissions associated with the Parts Blasting Room (2S) were calculated using 100,000 lbs/yr of VBlast and operating for 200 hours/yr. Emission factor for Abrasive Blasting was obtained from AP-42, Chapter 13, Section 2.6 (Table 13.2.6-1.).

The following table is a summary of the emissions from the HUNTINGTON STEEL AND SUPPLY COMPANY's Holden Facility:

Table # 1				
Criteria Pollutant	Total Controlled Emissions			
	(1S)		(2S)	
	lb/hr	ton/yr	lb/hr	ton/yr
VOC	33.40	19.46	0	0
PM	0.49	0.063	9.0	1.35
PM_{10}	0.23	0.03	4.3	0.64
MIBK	23.50	5.89	0	0
Tetrachloroethylene	8.90	2.04	0	0
Xylene	20.40	7.58	0	0
Ethyl Benzene	6.25	2.02	0	0
MEK	33.40	4.66	0	0
Total HAPs	92.45	19.77	0	0

REGULATORY APPLICABILITY

45CSR4 To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The facility is subject to the requirements of 45CSR4 and shall not allow the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

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

The facility will not cause, suffer, allow or permit particulate matter to be vented into the open air form any type source operation or duplicate source operation, or from all pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity specified under the appropriate source operation type in Table 45-7A of the rule.

The purpose of this rule is to prevent and control particulate matter air pollution from manufacturing process and associated operations.

The facility performs abrasive blasting of metal parts varying in size to allow for the paint/coating to adhere to the rough surface. The Regulation 7 particulate mass standard limit was used to estimate the emissions. Using 10,000 pounds per hour as the maximum weight of material processed through the operations in a single hour, for an 'a' source Table 45-7A results in a particulate matter emission rate of 10.0 lbs/hour.

The process activities involved with the coating process is classified as type "a" source operation. Using the maximum hourly application rate of 44.65 pounds per hour (5 gallons) listed in the application as hourly emissions (Attachment N), along with a transfer efficiency rate of solids at 45%, settling chamber efficiency of 80% and a control efficiency of 90% for the fiberglass filter control device, it was determined that the paint rooms' maximum controlled PM to be 0.49 pounds per hour. Thus, this operation should have no problem achieving compliance with the process weight limits of this rule.

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

The purpose of this rule is to set forth the procedures for stationary source reporting, and the criteria for obtaining a permit to construct and operate a new stationary source which is not a major stationary source, to modify a non-major stationary source, to make modifications which are not major modifications to an existing major stationary source and to relocate non-major stationary sources within the State of West Virginia.

HUNTINGTON STEEL AND SUPPLY COMPANY has proposed to install a paint room that has a potential to emit before controls greater than 6 pounds per hour and 10 tons per year of volatile organic compounds including hazardous air pollutants. Thus, HUNTINGTON STEEL AND SUPPLY COMPANY must obtain a permit for the paint room as required in 45CSR§13-5.1. The company has complied with the public review procedures in 45CSR§13-8.3. by publishing a legal ad in the *Logan Banner* on June 08, 2016. In addition, the applicant submitted a complete application and paid the permit application fees.

The source has the potential to emit of less than 100 tons per year of VOCs. In addition, emissions of HAPs are below the major source trigger levels of 10 tons per year of single HAPs and 25 tons per years of total combined HAPs. Thus, the source is not subject to a MACT standard as a major source or required to obtain a Title V operating permit in accordance with 45 CSR 30. Therefore, the source is subject to 45 CSR 22 as a 9E – Miscellaneous Surface Coating.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Ethyl benzene

Ethyl benzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethyl benzene 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 ethyl benzene 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 ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Xylene

Commercial or mixed xylene usually contains about 40-65% *m*-xylene and up to 20% each of *o*-xylene and *p*-xylene and ethyl benzene. 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.

Methyl Isobutyl Ketone

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.

Tetrachloroethylene
Tetrachloroethylene is widely used for dry-cleaning fabrics and metal degreasing operations. Effects resulting from acute (short term) high-level inhalation exposure of humans to tetrachloroethylene include irritation of the upper respiratory tract and eyes, kidney dysfunction, and neurological effects such as reversible mood and behavioral changes, impairment of coordination, dizziness, headache, sleepiness, and unconsciousness. The primary effects from chronic (long term) inhalation exposure are neurological, including impaired cognitive and motor neurobehavioral performance. Tetrachloroethylene exposure may also cause adverse effects in the kidney, liver, immune system and hematologic system, and on development and reproduction. Studies of people exposed in the workplace have found associations with several types of cancer including bladder cancer, non-Hodgkin lymphoma, multiple myeloma. EPA has classified tetrachloroethylene as likely to be carcinogenic to humans.

Methyl Ethyl Ketone
Methyl ethyl ketone is used as a solvent. Acute (short-term) inhalation exposure to methyl ethyl ketone in humans results in irritation to the eyes, nose, and throat. Limited information is available on the chronic (long-term) effects of methyl ethyl ketone in humans. Chronic inhalation studies in animals have reported slight neurological, liver, kidney, and respiratory effects. No information is available on the developmental, reproductive, or carcinogenic effects of methyl ethyl ketone in humans. Developmental effects, including decreased fetal weight and fetal malformations, have been reported in mice and rats exposed to methyl ethyl ketone via inhalation and ingestion. EPA has classified methyl ethyl ketone as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not required, because the proposed construction does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Per Section 4.1.4.a., the identity of any new coating containing a HAP(s) not listed in permit application R13-3325 must be identified to the Director in writing within thirty (30) days of using the coating. An MSDS sheet for the coating must also be supplied.

- Per Section 4.1.4., a 12-month rolling total must be used to determine that an individual HAP does not exceed 10 ton/yr.

- To determine if the VOC, HAP and PM limits given in Section 4.1.1. and 4.1.2. are met, the permittee will need to monitor and record:

• name and id number of each coating applied.
• number of hours used to apply each coating.
• date applied and amount of each coating applied, and
• amount of each coating disposed of as waste.

Using the above information, an annual combined VOC emission rate is to be calculated based on paint and solvent usage using a rolling total for any continuous span of 12 months.

- To determine if the PM limits in Section 4.1.2. are met, the permittee is to maintain records showing that the dry filters were changed out.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application R13-3325 indicates that HUNTINGTON STEEL AND SUPPLY COMPANY should meet all the requirements of the applicable rules when operated according to the permit application. Therefore, the writer recommends granting the applicant a Rule 13 construction permit for their metal parts painting facility.

Thornton E. Martin Jr.
Permit Engineer

June 24, 2016
Date