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.:	R13-3348
Plant ID No.:	049-00195
Applicant:	MEC CONSTRUCTION LLC
Facility Name:	Fairmont Plant
Location:	Fairmont, Marion County, WV
NAICS Code:	237120
Application Type:	Construction
Received Date:	November 16, 2016
Engineer Assigned:	Thornton E. Martin Jr.
Fee Amount:	$1,000.00
Date Received:	November 17, 2016
Complete Date:	December 05, 2016
Newspaper:	*Times West Virginian*
Applicant Ad Date:	November 11, 2016
UTMs:	Easting: 572.49 km Northing: 4363.28 km Zone: 17
Description:	Construct and operate equipment to cut, weld, clean, test and paint pipe.

DESCRIPTION OF PROCESS

MEC CONSTRUCTION LLC proposes to construct and operate a facility for preparing pipe for pipeline construction. Pipe, fittings and materials are received from off site. Pipes and fittings are cut, welded, inspected, hydrostatically tested, cleaned and painted per customer specification. The facility will have two (2) heated paint booths and a media blasting unit that will result in air pollutant emissions.

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

Paint Operation
Equipment – Paint Booth (1S) – 50' x 60' with natural gas fired make-up air unit
– Paint Booth (2S) – 18' x 60' with natural gas fired make-up air unit

The spray paint process will apply a surface coating onto miscellaneous steel parts. 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/NESHAP Standard 40 CFR Part 63) 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 (make-up air unit and filter). All coatings and solvents have been identified and documentation included with the Application.

Each Paint Booth utilizes a 1.5 MMBtu/hr (MDHI) natural gas fired burner for the make-up air unit and emissions from the overspray (5%) is collected by an Air Flow Technology Inc., Model 15g, two-stage, fiberglass filter (1C and 2C, respectively) which will provide a 98.81% capture efficiency.

Mechanical Cleaning
Equipment – Media Blast Booth (3S)

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.

MEC CONSTRUCTION LLC will primarily utilize carbon steel but, small amounts of garnet or black beauty may be used for small projects. The Applicant estimates 62.5 lb/hr of abrasive media will be utilized over the 200 hours/year operating schedule of the Blast Booth. Emissions from the Blast Booth are controlled through a Denray, Model 85120, single compartment baghouse. The baghouse will have a guaranteed minimum collection efficiency of 99%.

There are nine (9) categories of Coatings/Thinners/Solvents identified for use at the proposed facility. They are as follows: Carboline 890, Carboline 635, Carboline 859, Carboline 134, Sherwin Williams Zinc Clad III, Sherwin Williams Macropoxy 646, Sherwin Williams Zinc High Solids Polyurethane, Sherwin Williams Acrolon 218 HS and Sherwin Williams 235 Dura Plate.

SITE INSPECTION

Karl Dettinger of the Compliance and Enforcement Section of the North Central Regional Office provided information regarding the proposed facility: I am familiar with the former Ruskin facility in Fairmont (the building is right across Pleasant Valley Road from the DEP's Fairmont office). I did some research on the Ruskin activities, and they were involved in grit blasting, welding, solvent cleaning, and painting in the building, similar to what is being proposed by MEC Construction. I feel that this site is acceptable for this use, as it is in a commercial/industrial area, and there are no houses in the immediate vicinity. The building is a 2-story metal building.

Directions – Take I-79 to exit 133 (Kingmont Road). Travel East on Kingmont Road to Pleasant Valley Road (<0.25 miles). Go North on Pleasant Valley Road (<0.5 miles) to 2030 Pleasant Valley Road. Facility will be on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions generated at this facility are mainly from applying surface coatings, the media blasting room, and combustion of natural gas. The pollutants emitted are Particulate Matter and VOCs, which include hazardous air pollutants (HAPs).

The maximum particulate matter emissions (PM) from the paint booths are based on the worst case category (highest solids content %), maximum hourly usage (5 gal/hr/booth), maximum annual usage (800 gal/yr/both booths) and a transfer efficiency of 95%. VOC estimates are determined by using a mass balance approach and assuming that all of the VOCs in the coating were emitted. The hourly VOC emissions are estimated using the worst case category (highest VOC content by weight) applied at a maximum rate of 5 gal/hour. Hourly emissions are not based on the average hourly rate but a spike use of 5 gallons per hour for each material category. The annual VOC emissions are the sum total for each material category applied in both paint booths for a combined maximum of 800 gal/yr for each category. Maximum hourly and annual HAP emissions are based on the percentage by weight of the HAPs present in each material within a category and listing the worst case value for each HAP (hourly) and the sum total of all categories for each HAP (annual).

The PM, PM_{10}, & $PM_{2.5}$ emissions associated with the Media Blast Booth (3S) were calculated using 500 lb/day (62.5 lb/hr for 8 hours/day) of blast media and operating for 2,000 hours/yr. Emission factor for Abrasive Blasting was obtained from AP-42, Chapter 13, Section 2.6 (Table 13.2.6-1.).

Emissions from the heating units were calculated using emission factors from AP-42 Chapter 1, Section 4 (7/98).

The following table provides a summary of the proposed emissions from the MEC CONSTRUCTION LLC's Fairmont facility:

Table # 1								
Criteria Pollutant	Controlled Emissions							
	(1S)		(2S)		(3S)		**Total**	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
CO	0.13	0.55	0.13	0.55			0.26	**1.10**
NOx	0.15	0.66	0.15	0.66			0.30	**1.32**
PM	0.097	0.062	0.097	0.062	0.017	0.017	0.21	**0.14**
PM_{10}	0.096	0.061	0.096	0.061	0.008	0.008	0.20	**0.13**
$PM_{2.5}$	0.095	0.065	0.095	0.065	0.001	0.001	0.19	**0.13**
SO_2	0.001	0.004	0.001	0.004			0.002	**0.008**
VOC	13.35	6.445	13.35	6.445			26.70	**12.88**
Total HAPs	17.27	3.72	17.27	3.72			34.54	**7.44**
Cumene	0.21	0.011	0.21	0.011			0.42	0.021
Ethylbenzene	1.17	0.355	1.17	0.355			2.34	0.711
Ethylene Glycol	0.074	0.0037	0.074	0.0037			0.149	0.0074
Hexamethylene Diisocyanate	0.09	0.0065	0.09	0.0065			0.187	0.013
Methyl Isobutyl Ketone	5.68	0.395	5.68	0.395			11.35	0.79
Napthalene	0.10	0.0039	0.10	0.0039			0.19	0.01
Toluene	10.52	1.17	10.52	1.17			21.04	2.34
Xylenes	9.05	1.775	9.05	1.775			18.09	3.55

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 from 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. Using 62.5 pounds per hour as the maximum weight of material processed through the operation in a single hour, for an 'a' source Table 45-7A results in a maximum allowable particulate matter emission rate of 0.075 lbs/hour. The baghouse having a control efficiency of 99%, yields a maximum controlled PM emission rate of 0.02 pounds per hour.

The process activities involved with the coating process is classified as type "a" source operation. Using the maximum hourly application rate of 139.8 pounds per hour (5 gallons) of the Sherwin Williams Zinc Clad III (highest solids percentage) along with an overspray rate of solids at 5% and a control efficiency of 98.81% for the fiberglass filter control device, it was determined that the paint rooms' maximum controlled PM to be 0.093 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.

MEC CONSTRUCTION LLC has proposed to operate two paint rooms that have a potential to emit after controls greater than 6 pounds per hour and 10 tons per year of volatile organic compounds including hazardous air pollutants. Thus, MEC CONSTRUCTION LLC must obtain a permit for the paint rooms 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 *Times West Virginian* on November 11, 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.

Hexamethylene Diisocyanate

Hexamethylene diisocyanate (HDI) is an organic compound in the class known as isocyanates. More specifically, it is an aliphatic diisocyanate. It is produced in relatively small quantities, accounting for (with isophorone diisocyanate) only 3.4% of the global diisocyanate market in the year 2000.[2] Aliphatic diisocyanates are used in special applications, such as enamel coatings which are resistant to abrasion and degradation from ultraviolet light. These properties are particularly desirable in, for instance, the exterior paint applied to aircraft and vessels. This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

Ethylene Glycol

Ethylene glycol (IUPAC name: ethane-1,2-diol) is an organic compound with the formula $(CH_2OH)_2$. It is mainly used for two purposes, as a raw material in the manufacture of polyester fibers and for antifreeze formulations. It is an odorless, colorless, sweet-tasting syrup. Ethylene

glycol is moderately toxic. This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

Napthalene

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.

Cumene

Cumene is used in a variety of petroleum products. Acute (short-term) inhalation exposure to cumene may cause headaches, dizziness, drowsiness, slight incoordination, and unconsciousness in humans. Cumene has a potent central nervous system (CNS) depressant action characterized by a slow induction period and long duration of narcotic effects in animals. Cumene is a skin and eye irritant. No information is available on the chronic (long-term), reproductive, developmental, or carcinogenic effects of cumene in humans. Animal studies have reported increased liver, kidney, and adrenal weights from inhalation exposure to cumene. EPA has classified cumene 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.

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.

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.

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 R13-3348 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 R13-3348 indicates that MEC CONSTRUCTION LLC 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 pipe preparation facility.

Shannon E. Martin J.
Permit Engineer

December 05, 2016
Date

Non-Confidential