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**west virginia** department of environmental protection

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## **DRAFT ENGINEERING EVALUATION / FACT SHEET**

### BACKGROUND INFORMATION

Application No.: R13-3148  
Plant ID No.: 061-00132  
Applicant: AES Environmental, LLC  
Facility Name: Morgantown  
Location: Morgantown, Monongalia County  
NAICS Code: 562112 (Hazardous Waste Collection)  
Application Type: Construction  
Received Date: October 25, 2013  
Engineer Assigned: Laura Jennings  
Fee Amount: \$2,000.00  
Date Received: October 31, 2013  
Complete Date: January 6, 2014  
Due Date: April 6, 2014  
Applicant Ad Date: November 12, 2013  
Newspaper: *The Dominion Post*  
UTM's: Easting: 587.883 km      Northing: 4384.922 km      Zone: 17  
Description: AES Environmental, LLC (AES) is installing aerosol/paint can crushers and natural gas/propane fired generator set.

Comment: This application was initially assigned to a plant ID number of 061-00198; however, this is an existing facility that has history under plant ID 061-00132. The application was reassigned to the current ID number and the necessary references were corrected in DAQ's database.

### DESCRIPTION OF PROCESS

AES Environmental, LLC (AES) is located at the Morgantown Industrial Park. AES operates an aerosol/paint can recycling center. AES plans to install an additional aerosol/paint can recycling unit with a generator set that will utilize either natural gas or propellants (propane) captured from the aerosol/paint cans.

Four (4) aerosol/paint can recycling units will be utilized [1S, 2S, 3S, and 5S] Aerosol/paint

cans are received by truck. The aerosol/paint cans are sorted by type for processing in the appropriate unit. The cans are punctured in the unit and any remaining liquids are collected. The collected liquids are properly disposed of. The metal from the cans is recycled. In source [1S], propellants (propane) will be recovered from the aerosol/paint cans to power the generator set [4S]. The generator set [4S] will utilize natural gas when propane is not sufficient. The model year for the engine in the generator set is 2013.

Units [2S, 3S, and 5S] will not recover any propellants for fuel use. Unit [5S] serves as a backup to unit [2S]. Only one of these units is operated at any time.

All four (4) of the units vent to carbon adsorption units. The control efficiencies of the carbon adsorption units were not considered in the emission calculations.

Shipping of products to and from the facility is on paved industrial park roadways and is provided by commercial shipping/delivery companies, which is typical of any warehouse operation. Therefore, roadway emissions are not included as a source of emissions for this facility.

The emission units and control devices are identified in the emission units table below. The control efficiencies are not provided in the table below because they were not used to calculate potential emissions.

Emission Units Table:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type and Date of Change	Control Device
1S	1E	Aerosol/ Paint Can Crusher	2014	2000 cans/hr	new	1C or 2C
2S	2E	Aerosol Can Crusher	2014	800 cans/hr	existing	1C or 2C
3S	3E	Aerosol/ Paint Cans Crusher	2014	300 cans/hr	existing	3C
4S	1E	Natural Gas/ Propane Engine; ECO 38-2LN/4	2014	142 HP	new	N/A
5S	2E	Aerosol Can Crusher	2014	800 cans / hr	existing	1C or 2C
Control Devices						
Control Device ID	Control Device Type		Control Device Description			
1C	Adsorber		Siemens VSC3000-STC			
2C	Adsorber		Siemens VSC3000-STC			
3C	Adsorber		Siemens VSC3000-STC			

Material Safety Data Sheets were provided for the processes.

## SITE INSPECTION

This facility is well known by DAQ. The facility has a hazardous waste air permit under 45CSR25. The last inspection was a full on-site inspection conducted on August 22, 2013 by Josh Woody of DAQ's Compliance and Enforcement Group. There were no violations found at the time of the inspection and they were found to be in compliance.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions were calculated for the Aerosol can/paint unit [1S], the Super 800 aerosol can crushers [2S and 5S], and the Super 6PJ-VC aerosol/paint can crusher [3S] based on information provided by the vendor. The emissions calculations use the maximum hourly production rate of the units and the annual emissions are based on 8,760 hours per year.

Emission unit [1S] vents to Carbon Adsorbers(1C) or (2C). Emission units [2S] and [5S] vent to Carbon Adsorber (2C). Emission unit [3S] vents to Carbon Adsorber (3C). According to the air pollution control device sheets, the granular carbon in the adsorbers provide a minimum efficiency of ~80% control of the VOCs and HAPs. The control devices however were not used in the emission calculations. The spent carbon will be disposed of as a waste.

Hazardous Air Pollutants were calculated using the maximum percentage of HAP from multiple MSDSs. Therefore, the total HAP content is greater than 100%. This also explains why the Total HAP emissions for [1S] is greater than the Total VOC emissions.

Emission factors were provided by the engine manufacturer for NO<sub>x</sub>, CO, and VOC. Emissions were calculated using both natural gas and propane as fuel. Emission factors for SO<sub>2</sub>, PM, and hazardous air pollutants, including formaldehyde were calculated using AP-42 emission factors.

Fugitive Emissions:

A leak source data sheet was completed for the [1S] operation and is provided below. Fugitive emissions were calculated using the US EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-077 November 1995 Table 2-1 SOCM Average Emission Factors. The emission factors and calculations were reviewed by the writer. The total hourly VOC from fugitive emissions is 0.58 lb/hr and 2.53 tpy.

Fugitive Emission Leak Source Data:

Source Category	Pollutant	Number of Source Components	Estimated Annual Emissions (lbs / yr)
Pumps	Heavy Liquid VOC	1	166.5

Valves	Gas VOC	3	345.9
	Heavy Liquid VOC	1	4.4
Open-ended Lines	VOC	1	32.8
Compressors	VOC	1	4,403.2
Flanges	VOC	3	106.0

Emission calculations provided in the Emissions Summary Table were reviewed and verified by the writer.

Emissions Summary Table:

Emission Point ID	Emission Unit ID	Control Device	Regulated Pollutant	Maximum Potential Uncontrolled Emissions		Maximum Potential Controlled Emissions	
				lb/hr	tpy	lb/hr	tpy
1E	1S 4S	1C or 2C	PM	0.01	0.02	0.01	0.02
			PM <sub>10</sub>	0.01	0.02	0.01	0.02
			PM <sub>2.5</sub>	0.01	0.02	0.01	0.02
			CO	0.22	0.98	0.22	0.98
			NO <sub>x</sub>	0.01	0.03	0.01	0.03
			SO <sub>2</sub>	0.01	0.01	0.01	0.01
			VOC	1.28	5.61	1.28	5.61
			Ethyl Benzene	0.06	0.28	0.06	0.28
			Formaldehyde	0.01	0.04	0.01	0.04
			Hexane	0.03	0.11	0.03	0.11
			Glycol Ethers	0.16	0.71	0.16	0.71
			Methanol	0.08	0.36	0.08	0.36
			Toluene	0.55	2.40	0.55	2.40
			Mixed Xylene	0.68	2.96	0.68	2.96
Total HAPs	1.56	6.84	1.56	6.84			
2E	2S 5S	2C	VOC	0.51	2.23	0.51	2.23
			Methylene Chloride	0.36	1.56	0.36	1.56
3E	3S	3C	VOC	0.19	0.84	0.19	0.84

## Greenhouse Gas Emissions:

Greenhouse Gas Emissions for the engine were calculated according to 40 CFR98, Tables C-1 and C-2 and Equations C-2a and C-9a. The Global Warming Potentials (CO<sub>2</sub>e) calculations were calculated using the GWP provided in Table A-1 to Subpart A of Part 98. The GHG calculations provided in the application were reviewed and verified; however, the GWP of methane and nitrous oxide were revised and the new GWPs became effective in January 2014. The emission factor for carbon dioxide that is used in equation C-2a was also revised and became effective in January 2014. The table below shows the corrected GHG emissions based on the revised emission factors and global warming potential factors. The emissions were calculated for both natural gas and propane as fuels and the highest values were chosen.

### Greenhouse Gas Emissions (Metric Tons):

Source	Emission Point	CO <sub>2</sub>	Methane	Nitrous Oxide	CO <sub>2</sub> e
4S	1E	283.87	0.01	0.002	284.74

## Facility Emissions:

The emissions for the total facility emissions including fugitive emissions are provided in the table below.

Regulated Pollutant	Maximum Potential Emissions	
	lb/hr	tpy
PM	0.01	0.02
PM <sub>10</sub>	0.01	0.02
PM <sub>2.5</sub>	0.01	0.02
CO	0.22	0.98
NO <sub>x</sub>	0.01	0.03
SO <sub>2</sub>	0.01	0.01
VOC	2.56	11.21
Total HAPs	1.93	8.45
CO <sub>2</sub> e	n/a	284.74

## REGULATORY APPLICABILITY

### STATE REGULATIONS:

The following state regulations have been reviewed for applicability.

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

The facility meets the definition of a stationary source per 45CSR13-2.24.c because they have the potential to discharge more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis.

The applicant has met the requirements of 45CSR13 by placing a Class I legal notice in *The Dominion Post* on November 18, 2013, providing a complete permit application, and paying the required \$1,000 application fee and the \$1,000 NSPS fee.

45CSR16 STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

The facility is subject to this rule because they are subject to the federal NSPS, Subpart JJJJ standard further discussed in the federal regulatory section.

45CSR21 REGULATION TO PREVENT AND CONTROL AIR POLLUTION FROM THE EMISSION OF VOLATILE ORGANIC COMPOUNDS

This regulation applies to sources located in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. This facility is located in Monongalia County and is not included in the scope of this regulation.

45CSR22 AIR QUALITY MANAGEMENT FEE PROGRAM

The facility is subject to the fee program of 45CSR22. The facility has demonstrated compliance by paying the \$1,000 application fee for this construction permit application. DAQ has decided not to collect NESHAP fees for facilities that meet the requirements of 40CFR63, subpart ZZZZ by meeting the requirements of NSPS, subpart JJJJ.

The facility will be added to the Certificate to Operate (CTO) database for the annual CTO fee program.

45CSR25 CONTROL OF AIR POLLUTION FROM HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL FACILITIES

According to an inspection memo in the file, AES is a hazardous waste large quantity generator and is a permitted waste transfer station. The requirements for Rule 25 are not included in Rule 13 construction permits

and will continue to be permitted under the separate programs.

#### 45CSR27 TO PREVENT AND CONTROL THE EMISSIONS OF TOXIC AIR POLLUTANTS

The purpose of 45CSR27 is to prevent and control the discharge of toxic air pollutants requiring the application of best available technology (BAT).

Methylene Chloride meets the definition of a “toxic air pollutant” per 45CSR27-2.10. Methylene Chloride is listed as an ingredient of Pro Strip with a composition of 50-60 wt% according to the material safety data sheet.

Methylene Chloride is emitted from emission point [2E] from emission units [2S and 5S]. No other emission point at the facility will be emitting methylene chloride.

According to the process description and process flow diagrams provided in the application, emission units 2S and 5S are aerosol/paint can recycling units. The cans are punctured in the unit and any remaining liquids are collected. The collected liquids are properly disposed of. The metal from the cans is recycled. Units [2S and 5S] will not recover any propellants for fuel use in the generator.

The process described for emission units 2S and 5S does not meet the definition of a “chemical processing unit” per definition 2.4 of § 45-27-2.

“Chemical processing unit” means an assembly of reactors, tanks, distillation columns, heat exchangers, vaporizers, compressors, dryers, decanters, and/or other equipment used to treat, store, manufacture, or use toxic air pollutants. For the purpose of this rule, the term chemical processing unit includes surface coating equipment or similar equipment utilizing a toxic air pollutant as a solvent or for other purposes.

The facility is not subject to 45CSR27. Permit limitations will prohibit Pro Strip and methylene chloride containing materials from being processed in any emission unit other than emission units [2S and 5S] and will prohibit the recovery of Methylene Chloride containing propellants to be recovered for fuel use in the generator set.

#### 40CSR30 REQUIREMENTS FOR OPERATING PERMITS

This facility does not meet the definition of a “major source” per 45CSR30. The facility therefore is not subject to 40CSR30. It does not emit more than 10 tpy of any hazardous air pollutant (HAP) or more than 25 tpy of Total HAPs nor does it emit 100 tpy or more of any pollutant subject to regulation. Greenhouse gases are subject to regulation; however, have a

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PTE major source threshold of 100,000 tpy CO<sub>2</sub>e.

40CFR60, subpart JJJJ and 40CFR63, subpart ZZZZ for area sources are exempt from the requirements of Title V.

45CSR34 EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The facility is subject to this rule because they are subject to 40CFR63, Subpart ZZZZ standard further discussed in the federal regulatory section.

FEDERAL REGULATIONS

The following federal regulations have been reviewed for applicability.

40 CFR 60  
Subpart JJJJ STANDARDS OF PERFORMANCE FOR STATIONARY SPARK IGNITION  
INTERNAL COMBUSTION ENGINES

The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE). For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

The stationary SI ICE has a commence construction date after June 12, 2006. The facility is subject to this subpart.

The 2013 engine is 142 hp and is subject to the emissions standards § 60.4233(e), Table 1. The applicant chose to demonstrate compliance by purchasing an engine certified according to procedures specified in this subpart [§ 60.4243 (b)(1)]. The applicant provided an EPA certificate of conformity for the engine family for model year 2013. The applicant must also demonstrate compliance according to one of the methods specified in § 60.4243(a). The applicant may also be subject to § 60.4243 (f) if they do not operate and maintain the certified engine and control device according to the manufacturer's written emission-related instructions. The applicant may also be subject to § 60.4243 (g) if the engine has an AFR controller.

The facility is subject to the notifications, reports, and recordkeeping requirements of 60.4245 (a) and to the general provisions requirements in accordance with Table 3.

40 CFR63,  
Subpart ZZZZ NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR  
POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL  
COMBUSTION ENGINES

§ 63.6590 (c)(1) states that a new stationary RICE located at an area source meets the requirements of this subpart by meeting the requirements

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of 40 CFR part 60 subpart JJJJ. No further requirements apply.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

A summary of each of the Hazardous Air Pollutants that are components in the materials involved for the processes described in this application is provided below.

### **Ethyl Benzene:**

Ethyl benzene is mainly used in the manufacturing 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.

### **Formaldehyde:**

Formaldehyde is used mainly to produce resins used in particle board 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).

### **Glycol Ethers:**

Glycol ethers have many uses; these include use as solvents and as an ingredient in cleaning compounds, liquid soaps, and cosmetics. Acute (short-term) exposure to high levels of the glycol ethers in humans results in narcosis, pulmonary edema, and severe liver and kidney damage. Chronic (long-term) exposure to the glycol ethers in humans may result in neurological and blood effects, including fatigue, nausea, tremor, and anemia. No information is available on the reproductive, developmental, or carcinogenic effects of the glycol ethers in humans. Animal studies have reported reproductive and developmental effects from inhalation and oral exposure to the glycol ethers. EPA has not classified the glycol ethers for carcinogenicity. The glycol ethers are used as solvents for resins, lacquers, paints, varnishes, gum, perfume, dyes, inks, as a constituent of paints and pastes, cleaning compounds, liquid soaps, cosmetics, and hydraulic fluids. 2-Butoxyethanol is used in the production of cleaning agents and as a general solvent.

**n-Hexane:**

n-Hexane is a solvent that has many uses in the chemical and food industries, either in pure form or as a component of commercial hexane. The latter is a mixture that contains approximately 52% n-hexane; the balance is made up of structural analogs and related chemicals such as methylpentane and methylcyclopentane. Highly purified n-hexane is used as a reagent for chemical or chromatographic separations. Other grades of n-hexane are used as solvents for extracting edible fats and oils in the food industry and as a cleaning agent in the textile, furniture, and printing manufacturing industries. Hexane is the solvent base for many commercial products, such as glues, cements, paint thinners, and degreasers. n-Hexane is a minor constituent of crude oil and natural gas and occurs in different petroleum distillates. No data are available regarding the potential toxicity of n-hexane in humans orally exposed to n-hexane. However, as might be expected for a chemical with such wide application, the potential exists for persons to be environmentally and/or occupationally exposed to n-hexane via other routes of exposure.

**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.

Methanol is primarily used as an industrial solvent for inks, resins, adhesives, and dyes. It is also used as a solvent in the manufacture of cholesterol, streptomycin, vitamins, hormones, and other pharmaceuticals. Methanol is also used as an antifreeze for automotive radiators, an ingredient of gasoline (as an antifreezing agent and octane booster), and as fuel for picnic stoves. Methanol is also an ingredient in paint and varnish removers. Methanol is also used as an alternative motor fuel.

**Methylene chloride (Dichloromethane):**

Methylene chloride is predominantly used as a solvent. The acute (short-term) effects of methylene chloride inhalation in humans consist mainly of nervous system effects including decreased visual, auditory, and motor functions, but these effects are reversible once exposure ceases. The effects of chronic (long-term) exposure to methylene chloride suggest that the central nervous system (CNS) is a potential target in humans and animals. Human data are inconclusive regarding methylene chloride and cancer. Animal studies have shown increases in liver and lung cancer and benign mammary gland tumors following the inhalation of methylene chloride.

**Toluene:**

The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and

vomiting and central nervous system depression. Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies. The major use of toluene is as a mixture added to gasoline to improve octane ratings. Toluene is also used to produce benzene and as a solvent in paints, coatings, synthetic fragrances, adhesives, inks, and cleaning agents. Toluene is also used in the production of polymers used to make nylon, plastic soda bottles, and polyurethanes and for pharmaceuticals, dyes, cosmetic nail products, and the synthesis of organic chemicals.

### **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. Mixed xylenes are used in the production of ethylbenzene, as solvents in products such as paints and coatings, and are blended into gasoline.

## AIR QUALITY IMPACT ANALYSIS

The proposed project does not meet the definition of a major modification according to the definitions in 45CSR14 and 45CSR19; therefore, modeling is not required for this permit application.

## MONITORING OF OPERATIONS

The applicant proposed the recordkeeping requirements below in the application:

- Recording the carbon change outs in the Adsorbers
- Recording the number of aerosol cans/paint cans processed per month.
- Monitoring, recordkeeping, testing, and reporting requirements for engine [4S] per 40 CFR60, Subpart JJJJ.

The writer agrees with the proposed monitoring and has added:

- Recording the hours of operation

RECOMMENDATION TO DIRECTOR

It is the recommendation of the writer that Construction Permit R13-3148 be granted to American Environmental Services, Inc., Morgantown facility located in Monongalia County, WV. Based on the information provided in the permit application, the applicant meets all applicable federal and state air regulations pertaining to the requested change.

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Laura Jennings  
Permit Engineer

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Date

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