



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-1397B
Plant ID No.: 033-00038
Applicant: Federal Bureau of Investigation
Facility Name: Clarksburg Site
Location: Clarksburg, Harrison County
NAICS Code: 922190
Application Type: Modification
Received Date: August 16, 2010
Engineer Assigned: David Keatley
Fee Amount: \$2,000
Date Fee Received: August 12, 2010
Complete Date: September 29, 2010
Due Date: December 28, 2010
Applicant Ad Date: August 16, 2010
Newspaper: *The Exponent-Telegram*
UTM's: Easting: 562.399 km Northing: 4,353.190 km Zone: 17
Description: The facility currently consists of six (6) boilers, seven (7) emergency generators, and one (1) paint booth. The facility proposes the installation of two additional emergency generators. This permit will supercede and replace permit R13-1397A.

DESCRIPTION OF PROCESS

The Federal Bureau of Investigation (FBI) has the diesel emergency generators in the event of an interruption of normal electrical power. The natural gas fired boilers are used to heat water for the facility. The paint booth is used mainly for painting furniture.

SITE INSPECTION

On May 27, 2010 a site inspection was conducted. Driving directions are from Charleston. Take I79 N until exit 124 Jerry Dove Drive. Turn west on Jerry Dove

Drive and you will run into the Visitors Center.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The diesel generator emission calculations are based on 192 hours per engine per year.

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
B-1	Boiler #1 25 MMBTU/hr	Nitrogen Oxides	2.51	11.00
		Carbon Monoxide	2.11	9.24
		Volatile Organic Compounds	0.14	0.60
		Sulfur Dioxide	0.02	0.07
		Total Particulate Matter	0.19	0.84
B-2	Boiler #2 25 MMBTU/hr	Nitrogen Oxides	2.51	11.00
		Carbon Monoxide	2.11	9.24
		Volatile Organic Compounds	0.14	0.60
		Sulfur Dioxide	0.02	0.07
		Total Particulate Matter	0.19	0.84
B-3	Boiler #3 12.5 MMBTU/hr	Nitrogen Oxides	0.42	1.84
		Carbon Monoxide	0.35	1.55
		Volatile Organic Compounds	0.023	0.10
		Sulfur Dioxide	0.003	0.01
		Total Particulate Matter	0.032	0.14
B-4	Boiler #4 4.2 MMBTU/hr	Nitrogen Oxides	0.42	1.84
		Carbon Monoxide	0.35	1.55
		Volatile Organic Compounds	0.023	0.10
		Sulfur Dioxide	0.003	0.01
		Total Particulate Matter	0.032	0.14
B-5	Boiler #5 4.2 MMBTU/hr	Nitrogen Oxides	0.42	1.84
		Carbon Monoxide	0.35	1.55
		Volatile Organic Compounds	0.023	0.1
		Sulfur Dioxide	0.003	0.01
		Total Particulate Matter	0.032	0.14
B-6	Boiler #6 0.3 MMBTU/hr	Nitrogen Oxides	0.03	0.13
		Carbon Monoxide	0.025	0.11
		Volatile Organic Compounds	0.0017	0.01
		Sulfur Dioxide	0.0002	0.001
		Total Particulate Matter	0.0023	0.01
DG-1	Diesel Generator #1 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06

DG-2	Diesel Generator #2 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-3	Diesel Generator #3 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-4	Diesel Generator #4 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-5	Diesel Generator #5 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-6	Diesel Generator #6 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-7	Diesel Generator #7 2847 hp	Nitrogen Oxides	70.93	6.81
		Carbon Monoxide	15.63	1.5
		Volatile Organic Compounds	0.40	0.04
		Sulfur Dioxide	3.89	0.37
		Total Particulate Matter	0.63	0.06
DG-8	Diesel Generator #8 2847 hp	Nitrogen Oxides	34.90	3.35
		Carbon Monoxide	1.88	0.18
		Volatile Organic Compounds	0.71	0.068
		Sulfur Dioxide	0.027	0.0026
		Total Particulate Matter	0.17	0.016
DG-9	Diesel Generator #9 2847 hp	Nitrogen Oxides	34.90	3.35
		Carbon Monoxide	1.88	0.18
		Volatile Organic Compounds	0.71	0.068
		Sulfur Dioxide	0.027	0.0026
		Total Particulate Matter	0.17	0.016
PB-1	Paint Booth	Total Particulate Matter	0.015	0.004
		Volatile Organic Matter	3.93	0.98
		Antimony	0.46	0.116
		Ethyl Benzene	0.20	0.05
		Ethylene Glycol	0.42	0.1
		Cobalt	0.048	0.01
		Methanol	0.34	0.08

	Nickel	0.46	0.12
	Toluene	1.18	0.29
	Xylenes	0.59	0.15

REGULATORY APPLICABILITY

45CSR2 - To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers

3.1 No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

3.2. Compliance with the visible emission requirements of subsection 3.1 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of subsection 3.1.

4.1. No person shall cause, suffer, allow or permit the discharge of particulate matter into the open air from all fuel burning units located at one plant, measured in terms of pounds per hour in excess of the amount determined as follows: 4.1.b. For Type 'b' fuel burning units, the product of 0.09 and the total design heat inputs for such units in million B.T.U.'s per hour, provided however that no more than six hundred (600) pounds per hour of particulate matter shall be discharged into the open air from all such units.

The total heat input for the boilers is 71.2 MMBTU. The allowable total particulate matter based on this rule is 6.4 lb/hr. The proposed total particulate matter limit of 2.83 lb/hr is below this threshold.

45CSR2A - Testing, Monitoring, Recordkeeping and Reporting Requirements Under 45CSR2

When combusting natural gas this facility shall record date and time of start-up and shutdown, and quantity of fuel consumed on a daily basis (section 7.1.a.1).

45CSR10 - To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

3.3. Maximum Allowable Emission Rates for Similar Units in All Priority III Regions Except Region IV. -- No person shall cause, suffer, allow or permit the discharge of sulfur dioxide into the open air from all stacks located at one plant, measured in terms of pounds per hour, in excess of the amount determined as follows: 3.3.f.

For Type 'b' fuel burning units, the product of 3.2 and the total design heat inputs for such units discharging through those stacks in million BTU's per hour.

The total allowable sulfur dioxide is 228 lb/hr based on this rule. The proposed total sulfur dioxide of 2.81 is well below this threshold.

3.4.a. Unless otherwise approved by the Director, the maximum allowable emission rate for an individual stack shall not exceed by more than twenty-five percent (25%) the emission rate determined by prorating the total allowable emission rate specified in subsections 3.1, 3.2, or 3.3, on the basis of individual unit heat input at design capacity for all fuel burning units discharging through that stack.

The allowable sulfur dioxide stack emissions are: B-1 = 100 lb/hr, B-2 = 100 lb/hr, B-3 = 50 lb/hr, B-4 = 16.8 lb/hr, B-5 = 16.8 lb/hr, and B-6 = 1.2 lb/hr. All proposed stack emissions are below these thresholds.

3.6. No person shall circumvent the provisions of this rule by constructing fuel burning unit(s) larger than would be necessary to provide heat and/or power for an existing manufacturing plant, with a reasonable margin for plant expansion, in order to use that design heat input to raise the allowable sulfur content in fuel.

4.1. No person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations.

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

FBI's Clarksburg Facility is subject to 45CSR13 because it has the potential to emit 573 lb/hr and 85.47 tons/yr of uncontrolled NO_x which exceeds the threshold of 6 lb/hr and 10 tons/year of any uncontrolled regulated air pollutant.

45CSR16 - Standards of Performance for New Stationary Sources Pursuant to 40CFR60

45CSR16 incorporates by reference the standards of performance for new stationary sources (40CFR60). The FBI is subject to 40CFR60 Subpart Dc, and Subpart IIII, therefore the FBI is subject to 45CSR16.

45CSR30 - Requirements for Operating Permits

The FBI's boilers are subject to 40CFR60, Subpart Dc, and therefore subject to 45CSR30 as a deferred source. The FBI will be required to keep their Certificate to Operate current.

40CFR60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

60.40c For a boiler to be subject to this regulation it has to be constructed, modified, or reconstructed after June 9, 1989 and has a maximum design capacity of less than 100 MMBTU/hr and more than 10 MMBTU/hr.

Boiler #1, Boiler #2, and Boiler #3 meet this criteria, making them subject to Subpart Dc.

To show compliance with Subpart Dc's SO₂ standard the FBI will keep records of natural gas consumption for each calendar month.

40CFR60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

This source is subject to Subpart IIII because two of their engines (DG-8 and DG-9) will be built in 2010 and an owner or operator is subject to this subpart when the engine is manufactured after April 1, 2006.

40CFR63 Subpart HHHHHH - National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources

The WVDEP DAQ has not determined whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40CFR63, including the area source air toxics provisions of 40CFR63, Subpart HHHHHH for national emission standards for hazardous air pollutants: paint stripping and Miscellaneous surface coating operations at area sources.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Antimony Compounds

Acute (short-term) exposure to antimony by inhalation in humans results in effects on the skin and eyes. Respiratory effects, such as inflammation of the lungs, chronic bronchitis, and chronic emphysema, are the primary effects noted from chronic (long-term) exposure to antimony in humans via inhalation. Human studies are inconclusive regarding antimony exposure and cancer, while animal

studies have reported lung tumors in rats exposed to antimony trioxide via inhalation. EPA has not classified antimony for carcinogenicity.

Cobalt Compounds

Cobalt is a natural element found throughout the environment. Acute (short-term) exposure to high levels of cobalt by inhalation in humans and animals results in respiratory effects, such as a significant decrease in ventilatory function, congestion, edema, and hemorrhage of the lung. Respiratory effects are also the major effects noted from chronic (long-term) exposure to cobalt by inhalation, with respiratory irritation, wheezing, asthma, pneumonia, and fibrosis noted. Cardiac effects, congestion of the liver, kidneys, and conjunctiva, and immunological effects have also been noted in chronically-exposed humans. Cobalt is an essential element in humans, as a constituent of vitamin B₁₂. Human studies are inconclusive regarding inhalation exposure to cobalt and cancer, and the one available oral study did not report a correlation between cobalt in the drinking water and cancer deaths. EPA has not classified cobalt for carcinogenicity.

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.

Ethylene Glycol

Acute (short-term) exposure of humans to ethylene glycol by ingesting large quantities causes three stages of health effects: central nervous system (CNS) depression, followed by cardiopulmonary effects, and later renal damage. The only effects noted in one study of individuals exposed to low levels of ethylene glycol by inhalation for about a month were throat and upper respiratory tract irritation. Rats and mice chronically (long-term) exposed to ethylene glycol in their diet exhibited signs of kidney toxicity and liver effects. Several studies of rodents exposed orally or by inhalation showed ethylene glycol to be fetotoxic. An epidemiologic study on renal cancer mortality did not find an increased risk for workers exposed to ethylene glycol. EPA has not classified ethylene glycol for 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.

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.

Nickel

Nickel is an essential element in some animal species, and it has been suggested it may be essential for human nutrition. Nickel dermatitis, consisting of itching of the fingers, hands, and forearms, is the most common effect in humans from chronic (long-term) skin contact with nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. Human and animal studies have reported an increased risk of lung and nasal cancers from exposure to nickel refinery dusts and nickel subsulfide. Animal studies of soluble nickel compounds (i.e., nickel carbonyl) have reported lung tumors. EPA has classified nickel refinery dust and nickel subsulfide as Group A, human carcinogens, and nickel carbonyl as a Group B2, probable human carcinogen.

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

Based on the annual emissions rates this facility will not be a major source as defined by 45CSR14, so no air quality impact analysis was performed.

CHANGES TO PERMIT R13-1397A

Two additional emergency engines will be installed for backup power.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the FBI's Clarksburg Site meets all the requirements of applicable rules and regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Harrison County location should be granted a 45CSR13 construction permit for their facility.

David Keatley
Engineer

Date

Fact Sheet R13-1397B
Federal Bureau of Investigation
Clarksburg Facility