



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: 13-2865
Plant ID No.: 077-00086
Applicant: Mark Twain Holding Company, LLC
Facility Name: Mark Twain Redi-Mix Concrete Batch Plant # 1
Location: Bruceton Mills, Preston County
SIC / NAICS Code: 3273 / 327320
Application Type: Construction
Received Date: July 13, 2010
Engineer Assigned: Mindy Hendrickson
Fee Amount: \$500.00
Date Received: November 5, 2010
Complete Date: November 22, 2010
Applicant Ad Date: November 10, 2010
Newspaper: *The Preston County Journal*
UTM's: Easting: 627.429 km Northing: 4391.30 km Zone: 17
Description: Permit is being converted from a general permit (G50-B080) into a Rule 13 permit because of the addition of a diesel hot water heater. Hot water heater is a 2.76 MMbtu/hr Infern-O-Coroporation Model HWP 20-400, which is fueled by diesel at a maximum rate of 20 gal/hr.

DESCRIPTION OF PROCESS

Mark Twain Holding Company, LLC proposes to install an Infern-O-Therm Corporation 2.76 MMBtu/hr diesel fueled hot water heater (HWH1). The hot water heater will provide hot water to the batch mix with the water being fed directly to the truck for each batch. Facility process: Trucks will deliver aggregate to stockpile SP1 and sand to stockpile SP2. Endloaders will transfer aggregate to hopper H1, which transfers to belt conveyor BC1 and then to bin B1. Sand is transferred via endloader to hopper H2, which transfers to belt conveyor BC2 and then to bin B2. Aggregate and sand transfer from B1 and B2 to weigh hopper WH1, then to conveyor BC3, to conveyor BC4, and then to concrete truck. Cement is pneumatically transferred from truck to silo S1 and fly ash is pneumatically transferred from truck to bin B3. Trucks will also deliver cement and fly ash to storage silos S2 and S3 via the same transfer points. Cement will be transferred from S2 to S1 and fly ash from S3 to B3. Cement from S1 is transferred to weigh hopper WH2, and fly ash from B3 transfers by screw conveyors SC1 and SC2 to WH2. From WH2 screw conveyor SC3 transfers cement / fly ash to truck with vent filters (transfers to concrete truck are controlled by two (2) baghouses. Water based ad mixes are injected into the system along with water; however, there are no air emissions associated with the ad mix or water addition.

Mark Twain proposes to utilize the following equipment at the Mark Twain Redi-Mix Concrete Batch Plant # 1 site near Bruceton Mills, Preston County, WV:

Table 1: Equipment Summary

Equipment ID No.	Description	Year Installed	Maximum Production Rate		Control Equipment
			Hourly	Annual	
WH1	Weigh Hopper - Con-E-Co Lo-Pro 10 Aggregate and Sand	2010	400 tons / hr	48,000 tons / yr	FE
WH2	Weigh Hopper - Con-E-Co Lo-Pro 10 Cement and Fly Ash	2010	400 tons / hr	10,000 tons / yr	FE (VF3)
BH1	Fabric filter baghouse – Con-E-Co, RA 196-2100-10/10, Reverse Air Flow (concrete truck loading)				
BH2	Fabric filter baghouse – Con-E-Co, RA 196-2100-10/10, Reverse Air Flow (concrete truck loading)				
VF1	Filter Vent – C&W CP450-1239, Jet Pulse				
VF2	Filter Vent – C&W CP-305, Jet Pulse				
VF3	Filter Vent – Con-E-Co 14-23, Reverse Air Flow				
BC1	Belt Conveyor – aggregate	2010	180 tons / hr	27,000 tons / yr	
BC2	Belt Conveyor – sand	2010	140 tons / hr	21,000 tons / yr	
BC3	Belt Conveyor – aggregate and sand	2010	320 tons / hr	48,000 tons / yr	FE
BC4	Belt Conveyor – aggregate and sand	2010	320 tons / hr	48,000 tons / yr	PE
SC1	Screw Conveyor – fly ash	2010	60 tons / hr	2,000 tons / yr	FE
SC2	Screw Conveyor – fly ash	2010	60 tons / hr		FE
SC3	Screw Conveyor – cement and fly ash	2010	60 tons / hr	8,000 tons / yr	FE
			Storage Capacity	Maximum Throughput	Control Equipment
SP1	Open Stockpile – aggregate 21,780 ft ³ maximum base area	2010	5,000 tons	27,000 tons / yr	WS
SP2	Open Stockpile – sand 21,780 ft ³ maximum base area	2010	5,000 tons	21,000 tons / yr	WS
H1	Feed Hopper – aggregate	2010		27,000 tons / yr	PE
H2	Feed Hopper – sand	2010		21,000 tons / yr	PE
B1	Storage Bin – aggregate	2010	80 tons	27,000 tons / yr	PE
B2	Storage Bin – sand	2010	80 tons	21,000 tons / yr	PE
B3	Storage Bin – fly ash	2010	40 tons	2,000 tons / yr	FE (VF2)
S1	Silo – cement	2010	75 tons	8,000 tons / yr	FE (VF1)
S2	Silo – cement	2010	150 tons	8,000 tons / yr	FE
S3	Silo – fly ash	2010	150 tons	2,000 tons / yr	FE
T-1	Storage Tank – water	2010	20,000 gal	720,000 gal / yr	
T-2	Storage Tank – diesel fuel (mixing trucks)	2010	500 gal	100,000 gal / yr	
T-3	Storage Tank – diesel fuel (front end loader)	2010	500 gal	20,000 gal / yr	
HWH1	Hot Water Heater - Infern-O Therm Coporation Model HWP-20-400 (diesel) 2.76 MMBtu / hr	2011	20,000 gal (water)	20 gal / hr 175,200 gal / yr (diesel)	

SITE INSPECTION

Directions given in application: Take the Hazelton Road / County Route 5 exit off I-68 East just east of Bruceton Mills. Turn left at the end of ramp onto County Route 5. Go about 0.18 miles and turn right onto County Route 5/7 (Casteel Road). Go about 1.08 miles and the access road to the site is on the left.

Brian Tephabock from the DAQ North Central Regional Office was contacted about a concrete batch plant that had been erected and had not obtained an air permit for the facility. The following is taken from Mr. Tephabock's Compliance Monitoring Report dated August 16, 2010:

- 07/12/10 at 3:12pm a complaint was received by Charleston DAQ alleging a new concrete batch plant named Mark Twain Concrete was operating at Hazelton in Preston County without proper a DAQ permit to operate
- 07/12/10 Initial check and report from DAQ Permitting Group indicates no permits pending or on file
- 07/13/10 My initial investigation: No prior knowledge of the Facility or company name. From my Internet searching involving the WV Secretary of State's Online Business Organization Information Database, I determined that a Mark Twain Holding Company out of Missouri obtained a WV business license in 2010. I also discovered that Mark Twain Holding Company may be associated with Mark Twain Redi Mix.
- 07/15/10 at 9:00am I conducted an onsite inspection. No Mark Twain personnel was onsite. I saw an erected portable concrete batch plant which also included a sand stockpile, a limestone stockpile, an office trailer, and a portable power generator. The Facility is located in an industrial area near a machine shop operation. I proceeded to the nearby offices for Hensel Phelps Construction Company, the contractors overseeing the construction operations for the federal prison construction operations, where I then met with Marvin Moran - Project Manager, and Clif Fesler - Project Superintendent. I was informed by those persons that Mark Twain Redi Mix was to begin supplying concrete for the prison project beginning the next day and that the Mark Twain Manager, Jeff Bross, told them his company had obtained the proper permits to operate. I replied that my initial investigation did not reveal any permit application or issuance. They contacted Jeff Bross, and during our telephone conversation Mr. Bross indicated that the plant had not begun operating and a DEP DAQ Permit to Operate application had been submitted and subsequently received by the Charleston DAQ on 07/13/2010. I informed Mr. Bross that an issued Permit is required by 45CSR13 prior to constructing or operating the Facility. I informed Mr. Bross that a Notice of Violation ("NOV") would be issued for constructing without an issued DAQ Permit. Mr. Bross asked what would happen if he operated anyway, and I replied that he would then be committing a willful and knowing violation of 45CSR13 and such action could result in additional violations with large penalty amounts. Mr. Moran and Mr. Fesler then replied that since an NOV was going to be issued, the Facility would not be allowed to supply concrete for the prison construction until the violation is corrected. I informed all persons that the permitting process involved mandatory public notice and comment periods in addition to permit writer review, and the process could take from 45 to 90 days before the permit is issued.
- 07/15/10 at 2:50pm I met offsite with Larry Boden, maintenance person and representative of Mark Twain Redi Mix, and issued an NOV of Rule 45CSR13 Section 5.4 for construction of the concrete batch plant and associated stock piles of material for mix prior to issuance of a Permit to Operate.
- 07/19/10 I faxed a copy of the NOV to Jeff Bross.

- 07/20/10 at 8:45am I notified the complainant of the results of my investigation and subsequent NOV issuance.

- 07/29/10 I received the required NOV written response. Such response indicated that Mark Twain Holding Company, LLC had filed an application for General Permit G50-B registration which was received by WV DEP on July 13, 2010, and the Company was pursuing securing coverage under that General Permit.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Fugitive emissions include particulate emissions from haulroads, stockpiles, and work areas. A water truck will be utilized to control the emissions from the haulroads as needed. Water will also be applied to the work areas around the stockpiles using the water truck or water sprays. A Con-E-Co 196-2100-10/10 series fabric filter dust collector system (BH1 and BH2) will be utilized to control dust during concrete truck loading. C&W and Con-E-Co vent filters will minimize dust from the weigh hoppers, cement silo, and fly ash bin. Emissions were calculated by Chris Schultz of Potesta using the DAQ’s General Permit G50-B Emission Calculation Spreadsheet G50ECALC for Concrete Batch Plants.

Table 2: Current facility emissions summary (G50-B080):

Emission Source	Controlled PM Emissions		Controlled PM ₁₀ Emissions	
	lb/hour	TPY	lb/hour	TPY
Fugitive Emissions				
Stockpile Emissions	0.31	1.37	0.15	0.65
Unpaved Haulroad Emissions	34.61	4.20	10.21	1.24
Fugitive Emissions Total	<i>34.92</i>	<i>5.57</i>	<i>10.36</i>	<i>1.88</i>
Point Source Emissions				
Transfer Point Emissions	8.73	0.62	4.11	0.29
Point Source Emissions Total (PTE)	<i>8.73</i>	<i>0.62</i>	<i>4.11</i>	<i>0.29</i>
FACILITY EMISSIONS TOTAL	43.65	6.19	14.47	2.18

Hot water heater (HWH1) emissions were calculated using AP-42, 1.3, Fuel Oil Combustion emission factors by Chris Schultz of Potesta & Associates, Inc. And are summarized in the following two (2) tables:

Table 3a: Proposed heater criteria pollutants

	lb/hr	tons/yr
CO	0.10	0.44
NOx	0.40	1.76
PM ₁₀	0.02	0.09
PM	0.04	0.18
SO ₂	0.15	0.63
VOC	0.01	0.03

Table 3b: Proposed heater hazardous air pollutants

	lb/hr	tons/yr
Lead	0.0001	0.0002
Benzene	0.0001	0.0001
Ethylbenzene	0.0001	0.0001
Formaldehyde	0.0007	0.0027
Napthalene	0.0001	0.0001
Toluene	0.0002	0.0006
Xylene	0.0001	0.0001
Total HAPs	0.0014	0.0039

REGULATORY APPLICABILITY

The facility, as proposed to be permitted under this application R13-2674A, is subject to the following state rules and federal regulations:

WV STATE RULES

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

The facility is exempt from sections 4, 5, 6, 8, and 9 because the hot water heater (2.76 MM btu/hr) is below 10 MM BTU/hr.

45CSR7 To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

The facility will show compliance for the opacity limit of this rule (§45-7-3.1) by performing visible emission observations as necessary according to the methods established in 45CSR§7A.

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

The facility is exempt from sections 3 and 6 because the hot water heater (2.76 MM btu/hr) is below 10 MM BTU/hr.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation

The changes proposed in this application will result in an increase of the following emissions: 0.44 TPY of CO, 1.76 TPY of Nox, 0.09 TPY of PM10, 0.18 TPY of PM, 0.63 TPY of SO2, 0.03 TPY of VOC, and 0.0039 TPY of total HAPs.

FEDERAL REGULATIONS

40cfr63 Subpart JJJJJ

National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

This subpart goes into effect on May 20, 2011, which will occur before the 30 day public notice period will end for 13-2865. Normally hot water heaters would be exempt from this regulation. However, the definition of a hot water heater limits the tank capacity of 120 gallons. Mark Twain's hot water heater (HWH1) is a 20,000 gallon portable water tank.

HWH1 will be subject to initial notification, notification of compliance status, performance tune-ups, and work practice and management practice standards within this subpart. These requirements are written in the Testing, Recordkeeping, and Reporting Requirements sections of permit 13-2865.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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.

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).

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.

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.

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.

MONITORING OF OPERATIONS

Maximum concrete production throughput, operation hours, and visible emissions will be monitored –

- 4.2.1. For the purpose of determining compliance with maximum throughput limits set forth in 4.1.1., the permittee shall monitor concrete production and maintain certified daily records. An example form is included as Appendix A. Such records shall be retained onsite by the permittee for at least five (5) years. Certified records shall be made available to the Director or his duly authorized representative upon request.
- 4.2.2. For the purpose of determining compliance with maximum operation time set forth in 4.1.2., the permittee shall monitor operation hours and maintain certified daily records. An example form is included as Appendix A. Such records shall be retained onsite by the permittee for at least five (5) years. Certified records shall be made available to the Director or his duly authorized representative upon request.
- 4.2.3. For the purpose of determining compliance with the opacity limits of 45CSR§7, the permittee shall conduct visible emission checks and / or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit.
 - a. The visible emission check shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40CFR Part 60, Appendix A, Method 22 or from the lecture portion of the 40CFR Part 60, Appendix A, Method 9 certification course.
 - b. Visible emission checks shall be conducted at least once per calendar month with a maximum of forty-five (45) days between consecutive readings. These checks shall be performed at each source (stack, transfer point, fugitive emission source, etc.) for a sufficient time interval, but no less than one (1) minute, to determine if any visible emissions are present. Visible emission checks shall be performed during periods of normal facility operation and appropriate weather conditions.
 - c. If visible emissions are present at a source(s) for three (3) consecutive monthly checks, the permittee shall conduct an opacity reading at that source(s) using the procedures and requirements of Method 9 as soon as practicable, but within seventy-two (72) hours of the final visual emission check. A Method 9 observation at a source(s) restarts the count of the number of consecutive readings with the presence of visible emissions.

CHANGES TO PERMIT G50-B080

The general permit registration is being converted to a Rule 13 permit. A diesel hot water heater has been added, making it ineligible for the G50-B general permit. 40cfr63 Subpart JJJJJ requirements (GACT) involving the hot water heater have been included in the permit.

RECOMMENDATION TO DIRECTOR

The information contained in the permit application R13-2685 indicates that compliance with all applicable state rules and federal regulations should be achieved when all proposed control methods are in operation. Therefore, the granting of a permit to Mark Twain Holding Company, LLC for the modification of a concrete batch facility located near Bruceston Mills, Preston County, West Virginia, is hereby recommended.

Mindy Hendrickson
Permit Engineer

April 27, 2011
Date