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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2818G
Plant ID No.: 051-00125
Applicant: MarkWest Liberty Midstream & Resources L.L.C. (MarkWest)
Facility Name: Majorsville Gas Plant
Location: Majorsville, Marshall County
NAICS Code: 211112
SIC Code: 1321
Application Type: Modification
Received Date: December 8, 2016
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$2,000.00
Date Received: December 8, 2016
Complete Date: January 12, 2017
Due Date: April 12, 2017
Applicant Ad Date: December 12, 2016
Newspaper: *Wheeling Intelligencer*
UTM's: Easting: 540.947 km Northing: 4,423.83 km Zone: 17
Description: Modification application to construct one (1) new depropanizer tower (cryogenic plant) to remove liquids from the gas stream. An additional deethanizer will be constructed to remove ethane from the residual natural gas.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2818G:

MarkWest proposes to construct additional processing capability at the natural gas processing plant at the Majorsville site. The processing capability will consist of adding one (1) natural gas processing plant (Majorsville VII) with a maximum capacity of 230 million standard cubic feet per day (mmscfd). One (1) stabilization unit will be installed to remove carryover methane and ethane from the natural gas liquids. The plant will be installed with appropriate electric compressor engines, and heaters.

Promoting a healthy environment.

The Majorsville Processing Plant is used as a gathering station for gas wells throughout southwest Pennsylvania and West Virginia. Upon entering the plant the gas goes through a mol sieve which is designed to remove liquids from the gas stream. Heaters are used to regenerate the mol sieve on a regular basis to remove the water and hydrocarbons. After the mol sieve, the gas will be cooled through a cryogenic plant with mechanical refrigeration which serves to remove propane and heavier hydrocarbons in the gas stream. The natural gas liquids from the new plant will then pass through a stabilizer to remove any carryover methane and ethane in the liquid stream. The remaining gas stream (mostly methane and ethane) will pass through the deethanizers, so that ethane can be separated and recovered from the gas stream. The ethane will then be transferred via pipeline to market. The remaining natural gas will pass through the existing compressor engines of one of the electric driven engines prior to entering the downstream pipeline to market. Electric pumps will be located on site to transfer the recovered liquids to another facility for disposal or further processing.

SITE INSPECTION

The facility was last inspected on May 17, 2016 by Angela Carey of the DAQs Northern Panhandle Regional Office. The facility was found to be in compliance.

Latitude: 39.963611
Longitude: -80.520556



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this modification application consist of the emissions from four (4) heaters (17E, 19E, 23E, 24E), four (4) emergency generators (28E, 29E, 32E, 33E), and one (1) methanol tank (40E).

Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates and TCEQ Air Permit Technical Guidance. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Emission Point ID#	Process Equipment	Calculation Methodology
H-7741	17E	7.69 MMBTU/hr Regeneration Heater	EPA AP-42 Emission Factors
H-7781	19E	16.07 MMBTU/hr Hot Medium Oil Heater	EPA AP-42 Emission Factors
H-D2782	23E	119.2 MMBTU/hr DEethanizer Hot Medium Oil Heater	EPA AP-42 Emission Factors
H-D2741	24E	14.25 MMBTU/hr DeEthanizer Regen Heater	EPA AP-42 Emission Factors
M7-G-8	28E	145 hp Emergency Generator	EPA AP-42 Emission Factors / Vendor Data
M7-G-9	29E	145 hp Emergency Generator	EPA AP-42 Emission Factors / Vendor Data
MD2-G-10	32E	53 hp Emergency Generator	EPA AP-42 Emission Factors / Vendor Data
MD2-G-11	33E	32 hp Emergency Generator	EPA AP-42 Emission Factors / Vendor Data
MT-7	40E	520 gal Methanol Storage Tank	Negligible emissions

The total PTE after this proposed modification (including fugitives) is shown in the following table:

Pollutant	Maximum Pre-Modification Annual Facility Wide Emissions (tons/year)	Maximum Post-Modification Annual Facility Wide Emissions (tons/year)	Net Facility Wide Emissions Changes (tons/year)
Nitrogen Oxides	97.31	114.06	16.75
Carbon Monoxide	78.49	99.15	20.66
Volatile Organic Compounds	79.79	79.04	-0.75
Particulate Matter-10/2.5	7.87	8.63	0.76
Sulfur Dioxide	1.10	2.08	0.98
Total HAPs	12.74	13.07	0.33
Formaldehyde	5.58	5.63	0.05
Greenhouse Gas (CO ₂ e)	182,719	252,643	69,924

Maximum detailed controlled point source emissions were calculated by MarkWest and checked for accuracy by the writer and are summarized in the table on the next page.

MarkWest Liberty Midstream & Resources, L.L.C – Majorsville Gas Plant (R13-2818G)

Emission Point ID#	Source	NO _x		CO		VOC		PM-10/2.5		SO ₂		Total HAPs		Formaldehyde		CO ₂ e
		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	
2E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	9114
3E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	9114
4E	2,370 hp Compressor Engine	2.61	11.44	0.99	4.35	2.09	9.15	0.16	0.69	0.01	0.04	0.72	3.17	0.42	1.83	9114
5E	5.6 MMBTU/hr Heater	0.30	1.32	0.46	2.02	0.03	0.13	0.04	0.18	<0.01	0.01	0.01	0.05	<0.01	<0.01	3157
6E	15.4 MMBTU/hr Heater	1.34	5.85	1.27	5.56	0.08	0.36	0.11	0.50	<0.01	0.04	0.03	0.13	<0.01	<0.01	8681
9E	5.6 MMBTU/hr Heater	0.30	1.32	0.46	2.02	0.03	0.13	0.04	0.18	<0.01	0.01	0.01	0.05	<0.01	<0.01	3157
10E	7.69 MMBTU/hr Regen III Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	4335
11E	7.69 MMBTU/hr Regen IV Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	4335
12E	16.07 MMBTU/hr HMO III Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.03	0.13	<0.01	0.04	0.03	0.13	<0.01	<0.01	9059
13E	119.2 MMBTU/hr HMO I Heater	3.58	15.66	4.77	20.88	0.64	2.82	0.22	0.97	0.07	0.31	0.22	0.97	<0.01	0.04	67195
14E	14.25 MMBTU/hr Regen I Heater	0.57	2.50	0.58	2.56	0.27	1.19	0.19	0.81	0.01	0.04	0.03	0.11	<0.01	<0.01	8033
15E	7.69 MMBTU/hr Regen V Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	4335
16E	7.69 MMBTU/hr Regen VI Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	4335
17E	7.69 MMBTU/hr Regen VII Heater	0.41	1.80	0.32	1.38	0.04	0.18	0.06	0.25	<0.01	0.02	0.01	0.06	<0.01	<0.01	4335
18E	16.07 MMBTU/hr HMO IV Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.03	0.13	<0.01	0.04	0.03	0.13	<0.01	<0.01	9059
19E	16.07 MMBTU/hr HMO VII Heater	1.61	7.04	1.32	5.80	0.09	0.38	0.03	0.13	<0.01	0.04	0.03	0.13	<0.01	<0.01	9059
20E	10.65 MMBTU/hr Stabilization Heater	0.63	2.74	0.88	3.84	0.06	0.25	0.02	0.09	<0.01	0.03	0.02	0.09	<0.01	<0.01	6005
21E	254 hp I & II Emergency Generator	1.12	0.28	1.68	0.42	0.56	0.14	0.02	0.01	<0.01	<0.01	0.04	0.01	<0.01	<0.01	61
22E	145 hp III Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
23E	119.2 MMBTU/hr HMO II Heater	3.58	15.66	4.77	20.88	0.64	2.82	0.22	0.97	0.07	0.31	0.22	0.97	<0.01	0.04	67195
24E	14.25 MMBTU/hr Regen II Heater	0.57	2.50	0.58	2.56	0.27	1.19	0.19	0.81	0.01	0.04	0.03	0.11	<0.01	<0.01	8033
25E	145 hp III Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
26E	145 hp IV Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
27E	145 hp IV Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
28E	145 hp VII Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
29E	145 hp VII Emergency Generator	0.70	0.18	0.18	0.04	0.02	<0.01	0.23	0.06	0.58	0.14	0.01	<0.01	<0.01	<0.01	157
30E	53 hp I Emergency Generator	0.41	0.10	0.43	0.11	0.41	0.10	<0.01	<0.01	0.11	0.03	<0.01	<0.01	<0.01	<0.01	17
31E	32 hp I Emergency Generator	0.25	0.06	0.29	0.07	0.25	0.06	<0.01	<0.01	0.07	0.02	<0.01	<0.01	<0.01	<0.01	10
32E	53 hp II Emergency Generator	0.41	0.10	0.43	0.11	0.41	0.10	<0.01	<0.01	0.11	0.03	<0.01	<0.01	<0.01	<0.01	17
33E	32 hp II Emergency Generator	0.25	0.06	0.29	0.07	0.25	0.06	<0.01	<0.01	0.07	0.02	<0.01	<0.01	<0.01	<0.01	10
FL-991	3.7 mmcf/hr Flare	0.05	0.22	0.04	0.18	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	287
FL-1991	3.7 mmcf/hr Flare IV, VI, VII	0.49	0.20	2.47	0.26	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	240
PIG	Pigging Emissions	0	0	0	0	NA	0.15	0	0	0	0	0	0	NA	0.01	12
BD	Blowdown Emissions	0	0	0	0	0.40	1.75	0	0	0	0	0	0	NA	0.08	2841
TANKS	Pressurized Vessels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* Flare emissions are those emissions that exist under routine/planned activities.																
Total Point Source Emissions		32.76	114.06	29.01	99.15	11.14	40.66	3.29	8.63	4.07	2.08	3.04	12.78	1.32	5.63	252089
7E	Fugitive Equipment Leaks	0	0	0	0	8.76	38.38	0	0	0	0	NA	0.29	0	0	553
Total Fugitive Emissions		0.00	0.00	0.00	0.00	8.76	38.38	0.00	0.00	0.00	0.00	0.07	0.29	0.00	0.00	553
Facility Wide Emissions		32.76	114.06	29.01	99.15	19.90	79.04	3.29	8.63	4.07	2.08	3.11	13.07	1.32	5.63	252643

REGULATORY APPLICABILITY

The following rules apply to this modification:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

The existing gas plant and proposed changes calls for the use of heaters. Boilers or indirect heat exchangers are affected units under 45CSR2 and 40CFR60 Subpart Dc. However, a process heater that is primarily used to heat a material to initiate or promote a chemical reaction in which the materials participates as a reactant or catalyst are excluded as affected units under these rules.

MarkWest claims that the mole sieve regeneration heaters (H-D2741 and H-7741) and heaters for the de-ethanization unit (H-D2782 and H-7781) are process heaters and are excluded from these rules and regulations.

The mole sieve regeneration heaters use an adsorbent to dehydrate the wet gas prior to processing. Once the adsorbent is saturated with water, the mole sieve adsorbent must be regenerated. The regeneration heaters are used to provide process heat to regenerate the adsorbent, which could be considered as a catalyst bed. Therefore, the mole sieve regeneration heaters are excluded from 45CSR2.

The purpose of the de-ethanization heater is to supply heat for the de-ethanization process which prepares purity ethane to go to market by removing it from the mixed natural gas liquid stream and removing CO₂ to meet pipeline specifications. Therefore, these heaters are heating a heat transfer medium that participates in a chemical reaction in the Amine Still of the de-ethanization unit and are not affected units under 45CSR2.

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

The purpose of this rule is to establish standards for emissions of sulfur oxides from fuel burning units, manufacturing operations and combustion of refinery or process gas streams.

45CSR10 has the same definition of “process heater” as 45CSR2, and 40CFR60 Subparts Db & Dc. Therefore, the heaters that meet the definition of “process heater” are not considered as fuel burning units (boilers) in this rule. However, the heaters are considered part of a manufacturing process (45 CSR §10-2.11.) because they are equipment used in connection with the process. These heaters (H-D2741, H-7741, H-D2782, H-7781) are subject to the 2,000 ppm sulfur dioxide allowable in 45 CSR §10-4.1. The proposed SO₂ emissions from these units are negligible.

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)

45CSR13 applies to this source because MarkWest's proposed modification exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR60 Subpart IIII, OOOO and OOOOa).

MarkWest paid the appropriate application fee and published the required legal advertisement for this modification application.

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this facility by reference of 40CFR60, Subparts KKK, IIII, OOOO and OOOOa.

45CSR30 (Requirements for Operating Permits)

MarkWest is a major source subject to 45CSR30 due to their nitrogen oxides (NO_x) emissions exceeding major source thresholds. As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit.

40CFR60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE))

The 145 hp diesel fired generators (M7-G-8, M7-G-9) are USEPA certified stationary compression ignition engines according to 40CFR60 Subpart IIII.

The 53 hp diesel fired generator (MD2-G-10) is an USEPA certified stationary compression ignition engine according to 40CFR60 Subpart IIII.

The 32 hp diesel fired generator (MD2-G-11) is an USEPA certified stationary compression ignition engine according to 40CFR60 Subpart IIII.

Therefore, MarkWest will not be required to conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or three (3) years, whichever comes first, to demonstrate compliance.

40CFR60 Subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after September 18, 2015)

EPA published its New Source Performance Standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. EPA published amendments to the Subpart on September 23, 2013 and June 3, 2016. 40CFR60 Subpart OOOOa establishes emission

standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after September 18, 2015. The effective date of this rule is August 2, 2016.

- a. Each well affected facility, which is a single natural gas well.

There are no wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOOa would not apply.

- b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no centrifugal compressors at this facility. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOOa would not apply.

- c. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no modifications to reciprocating internal combustion engines located at this facility after September 18, 2015. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOOa would not apply to this permitting action.

- d. Pneumatic Controllers

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

All requirements regarding pneumatic controllers located at a natural gas processing plant under 40 CFR 60 Subpart OOOOa would apply.

- e. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOOa defines a storage vessel as a unit that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput for a 30-day period of production prior to the applicable emission determination deadline specified in this subsection. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a federal or state authority. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup.

There are no storage vessel affected facilities constructed after September 18, 2015. Therefore, the requirements regarding storage vessels under 40 CFR 60 Subpart OOOOa would not apply.

- f. The group of all equipment, except compressors, within a process unit is an affected facility.
- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.
 - Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a of this subpart.
 - The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

Majorsville VII was constructed after September 18, 2015. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would apply to this equipment.

- g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.
- Each sweetening unit that processes natural gas is an affected facility; and
 - Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
 - Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423a(c) but are not required to comply with §§60.5405a through 60.5407a and paragraphs 60.5410a(g) and 60.5415a(g) of this subpart.
 - Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405a through 60.5407a, 60.5410a(g), 60.5415a(g), and 60.5423a of this subpart.

There are no sweetening units at the Majorsville Gas Plant. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOOa would not apply.

h. Pneumatic Pumps

There are no pneumatic pump affected facilities constructed after September 18, 2015. Therefore, the requirements regarding pneumatic pumps under 40 CFR 60 Subpart OOOOa would not apply.

i. Collection of fugitive emission components.

Majorsville VII was constructed after September 18, 2015. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would apply to this equipment.

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. The emergency generators (22E, 23E) at the Majorsville Gas Plant are subject to the area source requirements for non-emergency compression ignition engines.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart IIII. These requirements were outlined above. The proposed engines meet these standards.

The following rules do not apply to this modification:

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

40CFR60 Subpart Dc applies to steam generating units. The rule further defines a steam generating unit as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. However, this term does not include process heaters as defined in this subpart. Process heater is defined as a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst. The process heaters at the Majorsville Gas Plant are dedicated to the removal and separation of NGLs from the gas stream. They do not serve any other purpose such as providing steam for the heating of buildings or for co-generation of electric power. Therefore, this rule does not apply to the proposed process heaters.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

This modification does not affect Subpart KKK applicability. 40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984 but before August 23, 2011. The equipment (Majorsville I & II) at the existing Majorsville Gas Plant is currently subject to this rule due to the natural gas

processing facility and this modification does not change that. MarkWest must continue meet the LDAR requirements of Subpart KKK. However, since the new equipment (Majorsville VII) will be constructed after September 18, 2015, it is not subject to Subpart KKK (§60.630(b)). It will, however, be subject to Subpart OOOOa as stated above.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

On September 30, 2013, EPA approved a redesignation request and State Implementation Plan (SIP) revision submitted by the State of West Virginia. The West Virginia Department of Environmental Protection (WVDEP) requested that the West Virginia portion of the Wheeling, WV–OH fine particulate matter (PM_{2.5}) nonattainment area (“Wheeling Area” or “Area”) be redesignated as attainment for the 1997 annual PM_{2.5} national ambient air quality standard (NAAQS).

The Majorsville Gas Plant is located in Marshall County, which is located in this metropolitan statistical area and is an attainment county for all pollutants. Therefore, the Majorsville Gas Plant is not subject to 45CSR19.

As shown in the following table, MarkWest is not a major source subject to 45CSR14 or 45CSR19 review. According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, the fugitive emissions are not included in the PTE below.

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	Majorsville PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	99.15	No
Nitrogen Oxides	250	NA	114.06	No
Sulfur Dioxide	250	NA	2.08	No
Particulate Matter 2.5	250	NA	8.63	No
Ozone (VOC)	250	NA	40.66	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and became effective on August 2, 2016. EPA defined the term “adjacent” and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The Majorsville Gas Plant will operate under the SIC code of 1321 (Natural Gas Liquid Extraction). There are other facilities operated by MarkWest that share the same two-digit major SIC code of 13. However, these facilities are not located on “contiguous or adjacent” property. Therefore, the emissions from this facility shall not be aggregated with other facilities for the purposes of making Title V and PSD determinations.

MONITORING OF OPERATIONS

MarkWest will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor and record quantity of natural gas routed through the process flare.
3. Monitor the presence of the flare pilot flame with a thermocouple or equivalent.
4. Establish a Leak Detection and Repair (LDAR) program for all equipment in VOC or wet gas service according to 40CFR60 Subparts KKK (Majorsville I and II), OOOO (Majorsville III – VI) and OOOOa (Majorsville VII).
5. Monitor and record quantity of constituents transferred from the storage tanks.

MarkWest will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed and hours of operation for each heater.
2. Maintain records of the amount of constituents transferred from the storage tanks.
3. Maintain records of the flare design evaluation.
4. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
5. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
6. Maintain records of the visible emission opacity tests conducted per the permit.
7. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
8. The records shall be maintained on site or in a readily available off-site location maintained by MarkWest for a period of five (5) years.

CHANGES TO PERMIT R13-2818F

R13-2818G will supersede and replace R13-2818F that was issued on June 19, 2014.

MarkWest proposes to construct additional processing capability at the natural gas processing plant at the Majorsville site. The processing capability will consist of adding one (1) natural gas processing plant (Majorsville VII) with a maximum capacity of 230 million standard cubic feet per day (mmscfd). One (1) stabilization unit will be installed to remove carryover methane and ethane from the natural gas liquids. The equipment added consists of four (4) heaters (17E, 19E, 23E, 24E), four (4) emergency generators (28E, 29E, 32E, 33E), and one (1) methanol tank (40E).

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that MarkWest meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Majorsville Gas Plant should be granted a 45CSR13 modification for their facility.

Jerry Williams, P.E.
Engineer

Date