west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3317
Plant ID No.:	017-00160
Applicant:	HEP Shalewater Solutions, LLC (HEP)
Facility Name:	Central Station
Location:	West Union, Doddridge County
NAICS Code:	213112 (Support Activities for Oil and Gas Operations)
Application Type:	Construction
Received Date:	May 6, 2016
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$1,000.00
Date Received:	May 6, 2016
Complete Date:	June 15, 2016
Due Date:	September 13, 2016
Applicant Ad Date	May 13, 2016
Newspaper:	*The Doddridge Independent*
UTM's:	Easting: 516.169 km Northing: 4,347.955 km Zone: 17
Description:	Oil and gas water treatment facility.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3317:

Waters, typically high in Total Suspended Solids (TSS), generated by Oil and Gas Exploration and Production activities will be collected in atmospheric tanker trucks at various client locations and sent to Central Station for recycle. Since all influent liquids have been subjected to significant weathering in an open atmosphere condition, flash emissions have occurred prior to shipping to Central Station. When a truck enters the facility, a sample will be collected and reviewed to determine if the material is acceptable. Unacceptable materials will be

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immediately rejected. Acceptable material will be offloaded (W2; 42E) via electrically operated pumps and sent to the influent storage tanks (ITS1-16; 1E-16E) via the influent header pipe system. If upon triage, trucks are determined to have an influent with a TSS >50,000 mg/L the client will have the option to bypass treatment and go directly to the filter press. From the influent tanks the water will flow through a series of static mixers (WT1-2; 17E-18E) where treatment chemicals to adjust pH and flocculants to settle solids will be added. Treatment chemicals are brought to the site in totes and stored in four 300-gallon day tanks (DT1-4; 44E-47E). The materials, including sodium hydroxide, flocculants and settling agents, are non-volatile and will not contribute any criteria pollutant emissions. The water will then pass through a series of settling tanks (ST1-5; 19E-23E) allowing time for solids to settle. The post treatment water then flows to multiple effluent holding tanks (ET1-12; 24E-35E). From the holding tanks the water is pumped back into tanker trucks for reuse at oil and gas facilities. Additionally, a brine mixing tank may possibly be installed at the facility. A portion of effluent water would flow from the holding tanks to the 90 bbl open top brine mixing tank (BM1; 39E), which would employ two electrical pumps to mix salt and water up to a desired specific gravity. If installed, emissions from the brine mixing process would be de minimis. Collected solids are pumped to several dewatering tanks where liquids are allowed settle (SI1-2; 36E-37E). The sludge is the processed through a filter press to render the wet cake material acceptable for landfilling (FT1; 38E). Any water decanted or pressed from the sludge is used for recycling purposes.

SITE INSPECTION

A site inspection was conducted on June 1, 2016 by the Doug Hammell of DAQ Enforcement Section. Equipment was located on site, but not operational. Mr. Hammell found the site suitable for the proposed operation.

Latitude: 39.2808
Longitude: -80.8125

Directions to the facility are as follows:

From West Union: Facility located off of US-50 approximately 0.15 miles on County Route 11 (Arnolds Creek Road).

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of sixteen (16) 21,000 gallon influent storage tanks (1E-16E), two (2) 21,000 gallon weir tanks (17E-18E), five (5) 21,000 gallon settling tanks (19E-23E), twelve (12) 21,000 gallon effluent storage tanks (24E-35E), two (2) 21,000 gallon sludge influent tanks (36E, 37E), one (1) 21,000 gallon filtrate water tank (38E), one (1) 3,780 gallon brine mixing tank (39E), water loading (40E, 42E), and sludge loadout (41E). Fugitive emissions from the facility are negligible due to the fact that most processes are in the liquid phase.

The following table indicates which methodology was used in the emissions determination:

Emission Point ID#	Process Equipment	Calculation Methodology
1E-16E	21,000 gallon Influent Storage Tanks	EPA Tanks 4.09d
17E-18E	21,000 gallon Weir Tanks	EPA Tanks 4.09d
19E-23E	21,000 gallon Settling Tanks	EPA Tanks 4.09d
24E-35E	21,000 gallon Effluent Storage Tanks	EPA Tanks 4.09d
36E-37E	21,000 gallon Sludge Influent Tanks	EPA Tanks 4.09d
38E	21,000 gallon Filtrate Water Tank	EPA Tanks 4.09d
39E	3,780 gallon Brine Mixing Tank	EPA Tanks 4.09d
40E	420,000 gal/day Water Load out	EPA AP-42 Emission Factors
41E	29,400 gal/day Sludge Load out	EPA AP-42 Emission Factors
42E	420,000 gal/day Water Load in	EPA AP-42 Emission Factors
Fugitive Dust	Vehicle Travel on Facility Roads	EPA AP-42 Emission Factors

The total facility PTE for the Central Station facility is shown in the following table:

Pollutant	R13-3317 PTE (tons/year)
Volatile Organic Compounds	21.37
Particulate Matter-10	30.22
Total HAPs	0.47

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

HEP Shalewater Solutions, LLC – Central Station (R13-3317)

Emission Point ID#	Source	VOC		Total HAPs		PM-10	
		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year
1E-16E	16 Influent Tanks	0.50	2.19	0.01	0.05	0.00	0.00
17E-18E	2 Weir Tanks	0.66	2.89	0.01	0.06	0.00	0.00
19E-23E	5 Settling Tanks	1.65	7.23	0.04	0.16	0.00	0.00
24E-35E	12 Effluent Tanks	0.44	1.97	0.01	0.05	0.00	0.00
36E-37E	2 Sludge Influent Tanks	0.09	0.37	0.00	0.01	0.00	0.00
38E	Filtrate Water Tank	0.03	0.13	0.00	0.00	0.00	0.00
39E	Brine Mixing Tank	0.00	0.01	0.00	0.00	0.00	0.00
40E	Water Load out	0.73	3.18	0.02	0.07	0.00	0.00
41E	Sludge Load out	0.05	0.22	0.00	0.01	0.00	0.00
42E	Water Load in	0.73	3.18	0.02	0.07	0.00	0.00
Total Point Source		**4.88**	**21.37**	**0.11**	**0.47**	**0.00**	**0.00**
FUG	Fugitive Dust Emissions	0.00	0.00	0.00	0.00	6.90	30.22
Total Fugitive		**0.00**	**0.00**	**0.00**	**0.00**	**6.90**	**30.22**
Total Sitewide		**4.88**	**21.37**	**0.11**	**0.47**	**6.90**	**30.22**

REGULATORY APPLICABILITY

The following rules apply to the facility:

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)

A 45CSR13 construction permit applies to this source due to the fact that HEP exceeds the regulatory emission threshold for criteria pollutants of 6 lbs/hr and 10 tons/year of a regulated air pollutant.

HEP paid the appropriate application fee and published the required legal advertisement for a construction permit application.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source and not subject to 45CSR30. HEP is required to keep their Certificate to Operate current.

The following rules do not apply to the facility:

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)

The Central Station is located in Doddridge County, which is an unclassified county for all criteria pollutants, therefore it is not applicable to 45CSR19.

As shown in the following table, HEP 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 on the following page.

Pollutant	**PSD (45CSR14) Threshold (tpy)**	**NANSR (45CSR19) Threshold (tpy)**	**Central Station PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	0	No
Nitrogen Oxides	250	NA	0	No
Sulfur Dioxide	250	NA	0	No
Particulate Matter-10	250	NA	0	No
Ozone (VOC)	250	NA	21.37	No

40CFR60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels)

The affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) (19,813 gallons) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa. This subpart also does not apply to pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.

There are tanks located at Central Station that are greater than 75 m^3 but less than 151 m^3, however the vapor pressure of the liquids being stored are less than 15.0 kPa (2.175 psia). Therefore, 40 CFR60 Subpart Kb is not applicable to the storage vessels at Central Station.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015)

EPA published in the Federal Register updates to new source performance standards (NSPS) on June 3, 2016. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions.

There are no affected sources located within the Central Station.

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 in the Federal Register updates to new source performance standards (NSPS) on June 3, 2016. 40CFR60 Subpart OOOOa establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG) in the form of a limitation on methane, volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions.

There are no affected sources located within the Central Station.

40CFR60 Subpart QQQ (Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems)

This rule applies to facilities constructed, modified or reconstructed after May 4, 1987 that operate an oil-water separator at a petroleum refinery.

There are no affected sources located within the Central Station.

40CFR63 Subpart DD (National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations)

This rule applies to certain provisions of wastewater treatment facilities that are a major source of HAPs. The Central Station is not a major source of HAPs, therefore, this rule would not apply.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*. The total HAP emissions from this facility were calculated to be 0.455 tons per year.

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) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as shown in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

SOURCE AGGREGATION

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of "Building, structure, facility, or installation" as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become 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.

There are no other facilities under common control that are located on the same site or on sites that share equipment and are within ¼ mile of this facility. Therefore, the emissions from Central Station should not be aggregated with any other facility.

MONITORING OF OPERATIONS

HEP will be required to perform the following monitoring and recordkeeping:

- Monitor the storage tanks to ensure they are operated per manufacturer's specifications
- Monitor and record the throughput for the loadouts
- Maintain records of testing conducted in accordance with the permit
- Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility.
- Monitor the water and sludge truck loading
- Wetcake disposal
- Quarterly AVO (audio, visual, olfactory) inspections
- The records shall be maintained on site or in a readily available off-site location maintained by HEP for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

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

Jerry Williams, P.E.
Engineer

6/24/2016
Date