



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: G70-A099A
Plant ID No.: 017-00130
Applicant: EQT Production Company
Facility Name: WEU-51 Pad
Location: West Union, Doddridge County
NAICS Code: 211111
Application Type: Construction
Received Date: August 26, 2015
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$1,500.00
Date Received: August 26, 2015
Complete Date: September 17, 2015
Due Date: November 1, 2015
Applicant Ad Date: September 8, 2015
Newspaper: *The Herald Record*
UTM's: Easting: 520.425 km Northing: 4,345.203 km Zone: 17
Latitude/Longitude: 39.25592 / -80.76326
Description: This permitting action is to increase the liquid throughput at the facility.

DESCRIPTION OF PROCESS

The following process description was taken from Registration Application G70-A099A:

The facility is an oil and natural gas exploration and production facility, responsible for the production of natural gas. Incoming raw natural gas from seven (7) wells enters the site through a pipeline. The raw gas is first routed through line heaters (S001-S007) to assist with the phase separation process in the downstream three-phase separators. From the three-phase separators, the natural gas stream flows to the downstream sales pipeline. In the three-phase separator, produced fluids (including water and condensate) are removed from the raw gas and then transferred to a flash separator in order to further reduce pressure of the liquids prior to the liquids being routed to the produced fluids storage tanks (S008-S015). Emissions from the flash separators and produced fluids tanks are directed to one (1) of two (2) enclosed combustion units (C017-C018). Produced fluids are pumped into a tank truck (S016) on an as needed basis and

Promoting a healthy environment.

are disposed of off site. Vapors produced during truck loading will also be routed to the enclosed combustion units. Two (2) thermoelectric generation units (S019-S020) will be operated to provide power to the site.

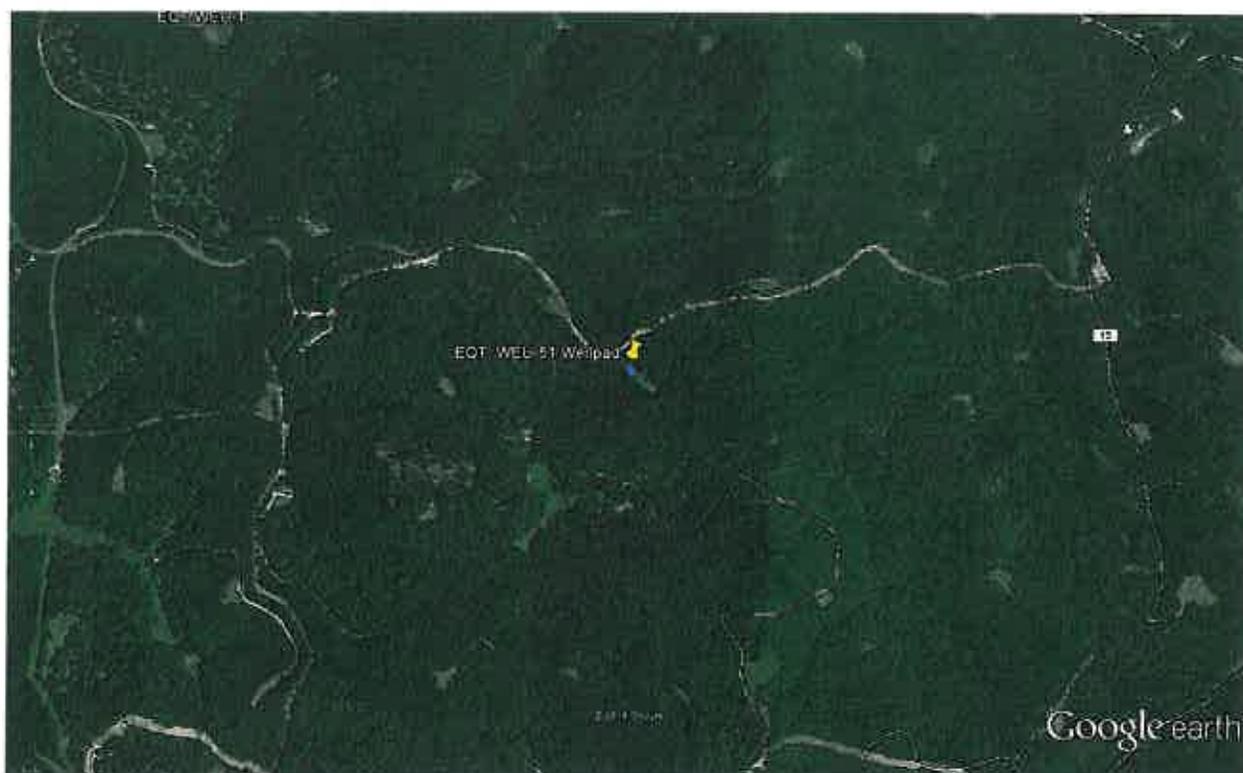
SITE INSPECTION

A site inspection was conducted by Doug Hammell of the DAQ Enforcement Section on October 15, 2014. Mr. Hammell stated that the site is appropriate for the facility. The closest residence was located approximately 1.3 miles from the proposed facility.

Latitude: 39.25592
Longitude: -80.76326

Directions to the proposed facility are as follows:

From West Union, head south on Neely Avenue toward West Main Street. Turn left onto West Main Street (0.4 miles). Turn right onto WV-18 S (2.5 miles). Turn right onto Maxwell Ridge and go approximately 2.2 miles to the site.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of the emissions from seven (7) line heaters (E001-E007), eight (8) produced fluids tanks (E017, E018), two (2) enclosed combustion devices (E017, E018), two (2) thermoelectric generators (E019, E020), one (1) tank truck loading rack (E017, E018), and fugitive emissions (EU-FUG).

This application proposes to increase the current liquid throughput at the facility from 4,997,580 gallons per year to 30,000,000 gallons per year.

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

Emission Unit ID#	Process Equipment	Calculation Methodology
E001 – E007	Seven (7) 1.50 MMBTU/hr Line Heaters	EPA AP-42 Emission Factors
E017, E018	Eight (8) 400 bbl (16,800 gallon) Produced Fluids Storage Tanks	E&P Tanks Process Simulation
E017, E018	Two (2) 11.66 MMBTU/hr Enclosed Combustion Devices	EPA AP-42 Emission Factors
E019, E020	Two (2) Thermoelectric Generators	EPA AP-42 Emission Factors
E017, E018	Tank Truck Loading Rank (13,692 gal/day)	EPA AP-42 Emission Factors

Fugitive emissions for the facility are based on calculation methodologies presented in Table W-1A to 40CFR98 Subpart W.

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
S008-S015 (Produced Fluids Tanks)	Volatile Organic Compounds	Enclosed Combustion Devices (E017, E018)	98.00 %
	Total HAPs		98.00 %
S016 (Truck Loading)	Volatile Organic Compounds	Enclosed Combustion Devices (E017, E018)	66.50 %
	Total HAPs		66.50 %

The total facility PTE for the WEU-51 NG Production Site 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	14.43	12.31	-2.12
Carbon Monoxide	12.12	10.34	-1.78
Volatile Organic Compounds	12.85	31.25	18.40
Particulate Matter-10/2.5	1.11	3.05	1.94
Sulfur Dioxide	0.09	0.07	-0.02
Total HAPs	0.78	1.23	0.45
Carbon Dioxide Equivalent	20,013	18,869	-1144

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

EQT Production Company – WEU-51 Pad (G70-A099A)

Emission Point ID#	Source	NO _x		CO		VOC		PM-10/2.5		SO ₂		Total HAPs		CO ₂ e 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	
E001	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E002	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E003	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E004	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E005	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E006	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E007	Line Heater	0.13	0.55	0.11	0.47	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	0.01	790
E019	Thermoelectric Generator	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	7
E020	Thermoelectric Generator	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	7
E016	Uncaptured Liquid Loading	0.00	0.00	0.00	0.00	0.37*	1.62*	0.00	0.00	0.00	0.00	0.00	0.00	0
E017	Enclosed Combustion Device	0.96	4.21	0.81	3.53	4.35*	19.03*	0.08	0.32	<0.01	0.03	0.13	0.59	6240
E018	Enclosed Combustion Device	0.96	4.21	0.81	3.53	4.35*	19.03*	0.08	0.32	<0.01	0.03	0.13	0.59	6240
Total Point Source PTE		2.83	12.31	2.39	10.34	4.39	19.24	0.16	0.71	0.02	0.07	0.17	0.73	18023
EP-HR	Haulroads	0.00	0.00	0.00	0.00	0.00	0.00	0.53	2.34	0.00	0.00	0	0.00	0
EP-FUG	Process Piping Fugitives	0.00	0.00	0.00	0.00	2.74	12.01	0.00	0.00	0.00	0.00	0.11	0.50	846
Total Fugitive PTE		0.00	0.00	0.00	0.00	2.74	12.01	0.53	2.34	0.00	0.00	0.11	0.50	846
Total Sitewide PTE		2.83	12.31	2.39	10.34	7.13	31.25	0.53	3.05	0.02	0.07	0.28	1.23	18869

The combustor emission points include potential controlled emissions from all storage tanks and liquid loading since all tanks have the potential to be routed to either combustor at a given time.

REGULATORY APPLICABILITY

The following rules apply to the facility:

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.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of all of the proposed fuel burning units (E001 – E007, E019, E020) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, EQT would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

EQT has two (2) enclosed combustion devices at the WEU-51 NG Production Site. These devices are subject to section 4, emission standards for incinerators. These devices have negligible particulate matter emissions. Therefore, the facility's enclosed combustion devices should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the enclosed combustion devices and the hours of operation. The facility will also monitor the flame of the enclosed combustion devices and record any malfunctions that may cause no flame to be present during operation.

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

45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of all of the proposed fuel burning units (E001 – E007, E019, E020) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

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 due to the fact that EQT is defined as a “stationary source” under 45CSR13 Section 2.24.b, which states that an owner or operator discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day of any regulated air pollutant. EQT’s uncontrolled volatile organic compounds (VOC) emissions exceed 45CSR13 permit thresholds. EQT has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (G70-A modification).

45CSR22 (Air Quality Management Fee Program)

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

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO 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 August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

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

The gas wells that currently exist at the WEU-51 NG Production Site were drilled principally for the production of natural gas and were done so after August 23, 2011. Therefore, these wells would be considered affected facilities under this subpart. The compliance date for these hydraulically fractured wells is October 15, 2012. EQT is required under §60.5410 to submit an initial notification, initial annual report, maintain a log of records for each well completion, and maintain records of location and method of compliance. §60.5420 requires EQT demonstrate continuous compliance by submitting reports and maintaining records for each completion operation.

- 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 the WEU-51 NG Production Site. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO 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 reciprocating compressors at the WEU-51 NG Production Site. Therefore, all requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would not apply.

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.

The pneumatic controllers proposed at this site are required to meet these requirements.

- 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 OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen 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.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. 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. The compliance date for applicable storage vessels is October 15, 2013.

The storage vessels located at the WEU-51 NG Production Site are controlled by enclosed combustion devices and emit less than 6 tpy of VOC. Therefore, EQT is not required by this section to further reduce VOC emissions by 95%.

- 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 §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 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 §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 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.

The WEU-51 NG Production Site is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

- 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 §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(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 §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the WEU-51 NG Production Site. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

The following rules do not apply to the facility:

40CFR60 Subpart 60.18 (General Control Device and Work Practice Requirements)

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. The enclosed combustion devices that EQT has proposed are not used to comply with one of these rules. The purpose of the enclosed combustion devices is to control emissions from the tanks that are routed to it. However, these tanks are not subject to 40CFR60 Subpart Kb due to their size. Therefore, EQT is not subject to this standard.

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

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The tanks that EQT has proposed to install are 63.60 cubic meters each. Therefore, EQT would not be subject to this rule.

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 WEU-51 NG Production Site is located in Doddridge County, which is an unclassified county for all criteria pollutants, therefore this facility is not applicable to 45CSR19.

As shown in the following table, EQT 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.

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	WEU-51 PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	10.34	No
Nitrogen Oxides	250	NA	12.31	No
Sulfur Dioxide	250	NA	0.07	No
Particulate Matter 2.5	250	NA	0.71	No
Ozone (VOC)	250	NA	19.24	No

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. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylenes	VOC	No	Inadequate Data

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.

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 WEU-51 NG Production Site is located in Doddridge County and will be operated by EQT.

1. The WEU-51 NG Production Site will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by EQT that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the WEU-51 NG Production Site does share the same SIC code as the wells and surrounding compressor stations.
2. “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

There are no EQT facilities that are contiguous or adjacent with the WEU-51 NG Production Site. Additionally, there are no co-located facilities with the WEU-51 NG Production Site.

3. There are other wells and compressor stations that are under common control of EQT.

Because the facilities are not considered to be on contiguous or adjacent properties, the emissions from the WEU-51 NG Production Site should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

EQT will be required to perform the following monitoring associated with this permit application:

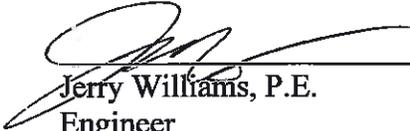
EQT will be required to perform the following monitoring and recordkeeping:

- Monitor all applicable requirements of 40CFR60 Subpart OOOO.
- Monitor and record the operating hours of the enclosed combustion devices.
- Monitor the presence of the pilot flames using a thermocouple or any other equivalent device to detect the presence of a flame at the enclosed combustion devices.
- Maintain records of testing conducted in accordance with the permit.
- Maintain records of the visible emission opacity tests conducted per the permit.
- 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.
- Monitor the tanks to ensure that the tanks vapors will be sent to enclosed combustion devices.
- Monitor the condensate truck loading to ensure that the vapors will be sent to enclosed combustion devices.

The records shall be maintained on site or in a readily available off-site location maintained by EQT for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates EQT's WEU-51 Pad meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Doddridge County location should be granted registration under General Permit G70-A.


Jerry Williams, P.E.
Engineer

10-22-2015
Date