



**west virginia department of environmental protection**

Division of Air Quality  
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Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
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**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: G70-A178  
Plant ID No.: 081-00245  
Applicant: Enervest Operating LLC Eastern Divison (Enervest)  
Facility Name: Tygrett Station  
Location: Near Bolt, Raleigh County, West Virginia  
NAICS Code: 211111  
Application Type: Construction  
Received Date: September 28, 2015  
Engineer Assigned: David Keatley  
Fee Amount: \$1,500  
Date Fee Received: October 7, 2015  
Complete Date: November 5, 2015  
Due Date: December 20, 2015  
Applicant Ad Date: September 18, 2015  
Newspaper: *The Register-Herald*  
UTM's: Easting: 418.188 km Northing: 4,635.070 km Zone: 17  
Description: Installation and operation of one (1) 145-bhp compressor engine. Permitting existing four (4) 210-bbl produced water tanks and two (2) 50-bbl produced water tank.

**DESCRIPTION OF PROCESS**

Natural gas from two (2) coal-bed methane natural gas wells goes to a separator to encourage separation of liquids from the natural gas. The natural gas from the separator is compressed to a higher pressure. The compressor is powered by a four-stroke rich-burn Caterpillar G3306NA (S01) natural gas fired compressor engine. The compressed natural gas from the separator exits the facility via pipeline. The liquids from the separator are sent to four (4) 210-bbl produced water tank (S04-S07) [two tanks at a maximum rate of 800 bbl/day and two at a rate of 1,000 bbl/day] and two (2) 50-bbl produced water tanks at a maximum rate of 2.5 bbl/day. The produced water is land applied on site.

## SITE INSPECTION

John Money Penny of DAQ's Compliance and Enforcement Section performed a site visit on October 28, 2015. The proposed site seems to meet the G35-A siting criteria.

From I77 take exit 44. Turn onto WV 3 west and travel until you reach Glen Daniel. Turn onto WV 99 west and travel until you reach CR 14 (Breckenridge Road). Turn onto CR 14 and travel for approximately 1.0 miles and turn left onto the access road and the facility is at the end of the access road on top the hill.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions from engine CE-1 for NO<sub>x</sub>, CO, HCHO, and VOCs were estimated with manufacturer emission factors other emissions were estimated with AP-42 four-stroke rich-burn emission factors. Emissions from the produced water tanks were estimated using TANKS 4.0.9d with a RVP 13.

Table 1: Summarized Estimated Controlled PTE

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
S01	Caterpillar G3306 NA Compressor Engine 145 bhp	Nitrogen Oxides	7.71	33.76
		Carbon Monoxide	0.45	1.96
		Volatile Organic Compounds	0.05	0.22
		Formaldehyde	0.08	0.33
S02	Produced Water Tank	Volatile Organic Compounds	0.06	0.27
S03	Produced Water Tank	Volatile Organic Compounds	0.06	0.27
S04	Produced Water Tank	Volatile Organic Compounds	0.11	0.47
S05	Produced Water Tank	Volatile Organic Compounds	0.11	0.47
S06	Produced Water Tank	Volatile Organic Compounds	0.09	0.40
S07	Produced Water Tank	Volatile Organic Compounds	0.09	0.40

Table 2: Estimated Controlled Facility Wide PTE

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	33.76
Carbon Monoxide	1.96
Volatile Organic Compounds	2.43
Particulate Matter	0.02
Formaldehyde	0.32
Total HAPs	0.34
CO <sub>2</sub> e	648

**REGULATORY APPLICABILITY**

**45CSR4** *To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors*

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable

**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 NOx PTE exceeds the thresholds of 6 lb/hr and 10 tons/year and therefore this facility requires a permit.

**45CSR22** *Air Quality Management Fee Program*

This facility is not a major source as can be seen in Table 2 and is not subject to 45CSR30. This facility has a maximum horsepower capacity less than 1,000 hp (145 hp) and is a 9M source and is required to pay a \$200 annual fee. Enervest is required to keep their Certificate to Operate current.

**40CFR63 Subpart ZZZZ NESHAP for Stationary Reciprocating Internal Combustion Engines**

This facility is an area source of Hazardous Air Pollutants as can be seen in Table 2. Engine CE-1 must comply with the applicable emission limitations, operating limitations, and other requirements no later than the date of installation. Engines CE-1 is a non-emergency, non-black start four-stroke rich-burn stationary RICE  $\leq$  500 HP (Table 2d.10). Engine CE-1 has oil, oil filter, spark plug, hose, and belt maintenance requirements.

The following regulations do not apply to the facility:

**40 CFR 60 Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution**

This subpart applies to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in the following paragraphs for which you commence construction, modification or reconstruction after August 23, 2011.

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

*The pad consists of three (3) natural gas wells. The wells were constructed before the August 23, 2011 applicability date. The construction of the facility was before this effective date. Therefore, the gas wells located at the facility are not subject to the requirements of this subpart.*

- (b) 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.

*The storage vessels at this facility are not subject to this regulations because the tanks were constructed before the effective date of this regulation.*

**40CFR60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)**

40CFR60 Subpart JJJJ sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the date of construction, date of manufacture, and horsepower (hp) of the spark ignition internal combustion engine. All proposed engines will commence construction after June 12, 2006.

Engine S02 is a SI RICE constructed before June 12, 2006 and is therefore not

subject to this regulation.

**40CFR Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984**

Pursuant to §60.110b, 40 CFR 60, Subpart Kb applies to “each storage vessel with a capacity greater than or equal to 75 cubic meters (m<sup>3</sup>) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.” The storage tanks located at this facility are smaller than 75 m<sup>3</sup>. Therefore, Subpart Kb does not apply to the storage tanks at this facility due to the tanks volume.

**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. This facility has the the following HAPs as emitted in substantive amounts (at least 20 pounds (0.01 tons) per year) in their emissions estimate: Formaldehyde. The following table lists each HAP’s carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 4: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects 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](http://www.epa.gov/iris).

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates compliance with all state and federal air quality requirements will be satisfied and this facility is expected to meet the requirements of General Permit G70-A. Therefore 's Enervest's request to construct and operate its natural gas production facility is recommended to the Director of Air Quality.



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Permit Writer - NSR Permitting

November 5, 2015

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Date

Fact Sheet G70-A178  
Enervest Operating LLC Eastern Division  
Tygrett Station