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west virginia department of environmental protection

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## ENGINEERING EVALUATION/FACT SHEET

### **BACKGROUND INFORMATION**

Application No.:	R13-2585E
Plant ID No.:	005-00020
Applicant:	Cranberry Pipeline Corporation
Facility Name:	Danville Compressor Station
Location:	Boone County
SIC/NAICS Code:	1311/211111
Application Type:	Modification
Received Date:	June 16, 2017
Engineer Assigned:	Joe Kessler, PE
Fee Amount:	\$1,000
Date Paid:	June 21, 2017
Complete Date:	July 12, 2017
Due Date:	October 10, 2017
Applicant Ad Date:	June 22, 2017
Newspaper:	<i>The Charleston Gazette-Mail</i>
UTM's:	422.07 km Easting • 4,214.25 km Northing • Zone 17
Latitude/Longitude:	38.07266/-81.88848
Description:	Modification to increase liquid throughputs of the storage tanks (TKO-1 and TKO-2) and the liquids loaded out via the truck load-out (TL-01).

On July 26, 2004, Permit R13-2585 was issued to Cranberry Pipeline Corporation (CPC) for a modification of the Danville Compressor Station located approximately 3.0 miles west-southwest of Danville, Boone County, WV. Prior to the issuance of R13-2585, the source was considered a “grandfathered” source and was not operating under any new source review (NSR) permits. At that time, the facility (originally constructed in 1957) consisted of three (3) 400 horsepower (hp) Cooper Bessemer GMXD6 compressor engines, one (1) 800 hp Cooper Bessemer GMV6-STX compressor engine added in 1980, one (1) 24,000 scf/day glycol dehydration unit (GDU) that was added in 1980, one 1.04 mmBtu/hr heater added in 1994, and five (5) storage tanks of various sizes (all less than 5,000 gallons). Under R13-2585, CPC added two (2) 810 hp Caterpillar G3512TALE 4-Stroke Lean Burn (4SLB) compressor engines and replaced the existing GDU with a new 25 mmscf/day GDU.

Since that time, the facility has been the subject of the following permitting actions:

- On July 18, 2005, R13-2585A was issued to CPC for the addition of a flare to the new GDU still vent;
- On February 26, 2010, R13-2585B was issued to CPC as a modification to add a Kohler 100REZG Generator with a 155.2 hp General Motors 4SLB 8.1L Engine;
- On May 18, 2012, R13-2585C was issued to CPC as a Class II Administrative Update to update the emissions associated with the GDU based on an updated site-specific gas analysis; and
- On July 2, 2014, R13-2585D was issued to CPC as a Class II Administrative Update to add catalytic controls to the Caterpillar engines and installation of a condenser at the facility.

## **DESCRIPTION OF PROCESS/MODIFICATIONS**

### ***Existing Facility***

The Danville Compressor Station is a typical natural gas compressor station. The facility receives natural gas via pipeline from upstream sources, compresses the gas using natural gas-fired reciprocating internal combustion engines (RICE), dries the gas using a triethylene glycol (TEG) GDU, and then transmits it via pipeline to other compressor stations located downstream. Liquids captured in the Inlet Separators and the BTEX Condenser are sent to the storage tanks. To effect this, the station currently consists of:

- Three (3) 400 hp 2SLB Cooper Bessemer GMXD6 compressor engines (grandfathered);
- One (1) 800 hp 2SLB Cooper Bessemer GMV6-STX compressor engine (grandfathered);
- Two (2) 800 hp 4SLB Caterpillar G3512TALE compressor engines (CE-5 and CE-6); and
- One (1) 25 mmscf/day TED GDU (Dehy) with a 0.75 mmBtu/hr Reboiler (RB1) and controlled by a 0.907 mmBtu/hr flare (F1).

Auxiliary equipment at the facility includes one (1) 155.2 hp General Motors 4SLB 8.1L emergency generator (EG-1), two (2) 4,200 gallons condensate storage tanks (TKO-1 and TKO-2), a liquids truck load-out (TL-01), and numerous smaller storage tanks for various low vapor pressure liquids.

## ***Proposed Modifications***

CPC is now proposing to make the following modifications of the Danville facility:

- Increase the aggregate liquids throughput of storage tanks TKO-1 and TKO-2 from 70,533 gallons to 243,355 gallons;
- Increase the throughput of the truck load-out from 70,533 gallons to 243,355 gallons; and
- Recalculate emissions from the storage tanks based on site specific materials data and the use of the ProMax 4.0 software.

## **SITE INSPECTION**

Due to the nature of the proposed modification, the author did not perform a site inspection of the facility for this permitting action. The facility was last “Full On-Site” inspected by DAQ Compliance/ Enforcement (C/E) Inspector Andy Grimm on March 15, 2016. This inspection found the facility to be “Status 30 – In Compliance.”

## **AIR EMISSIONS AND CALCULATION METHODOLOGIES**

The following will summarize only the calculation methodologies used by CPC to calculate the PTE of equipment and processes modified or added as part of this permitting action.

### ***Storage Tanks***

Revised uncontrolled working, breathing, and flashing emissions from the condensate storage tanks were based on the ProMax 4.0 software (streams labeling self-explanatory). ProMax software is a chemical process simulator for design and modeling of amine gas treating, glycol dehydration units, and other natural gas components. Based on a detailed input gas analysis and the components of the facility, the software can simulate and model the inputs and outputs of the system. A maximum annual throughput of 243,355 gallons was used in the calculations. Gas composition data used in ProMax were based on site-specific tests conducted at Danville on December 8, 2016. As the liquids contain very little VOCs, only trace emissions are produced from the storage tanks.

### ***Truck Loading***

Revised uncontrolled emissions from the loading of condensate/produced-water trucks were based on the ProMax 4.0 software (which uses loading emission factors as calculated based on Equation (1) of AP-42 Section 5.2-4.) and based on an annual load-out of 243,355 gallons. Gas composition data used in ProMax were based on site-specific tests conducted at Danville on

December 8, 2016. As the liquids contain very little VOCs, only trace emissions are produced from the truck loadout operations.

### ***Emissions Summary***

The following table lists the proposed changes in facility-wide emissions at the Danville Compressor Station as a result of the modifications discussed herein:

**Table 1: Change in Facility-Wide Post-Modification Annual (ton/yr) Emissions**

Source	CO	NO <sub>x</sub>	PM <sup>(1)</sup>	SO <sub>2</sub>	VOCs <sup>(2)</sup>	HAPs <sup>(2)</sup>
R13-2585	32.37	233.67	3.62	0.23	16.65	9.33
R13-2585E	32.37	233.67	3.62	0.23	15.62	9.33
<b><i>Change in Emissions →</i></b>	<b><i>0.00</i></b>	<b><i>0.00</i></b>	<b><i>0.00</i></b>	<b><i>0.00</i></b>	<b><i>-1.03</i></b>	<b><i>0.00</i></b>

(1) PM emissions are total PM and include condensables where applicable.

(2) VOC emissions went down in spite of the increase in liquids throughput as new emissions estimates were based on revised data (used within the ProMax software) that showed very little potential VOC emissions associated with the storage tanks/liquid loading.

### **REGULATORY APPLICABILITY**

The following will discuss each rule applicable or potentially applicable to only the modifications evaluated herein.

#### ***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***

The proposed modification of the Danville Compressor Station does not have the potential to increase the emissions of a regulated pollutant in excess of the thresholds that would, pursuant to §45-13-2.17, define the changes as a “modification” under 45CSR13. Therefore, the proposed changes would normally be eligible to be reviewed as a Class II Administrative Update. However, CPC voluntarily submitted the application as a modification and it was reviewed as such. Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct.”

As required under §45-13-8.3 (“Notice Level A”), CPC placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on June 22, 2017 in *The Charleston Gazette-Mail* and the affidavit of publication for this legal advertisement was submitted on June 30, 2017.

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***45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration (Non-Applicable)***

The Danville Compressor Station is located in Boone County, WV. Boone County is classified as "in attainment" with all National Ambient Air Quality Standards. Therefore, as the facility is not a "listed source" under §45-14-2.43, the individual major source applicability threshold for all pollutants is 250 TPY. As given in Table 1, the facility-wide PTE of the modified Danville Compressor Station is less than 250 TPY for all criteria pollutants. Therefore, the modified facility is not defined as a "major stationary source" under either 45CSR14 and the rule does not apply.

***45CSR30: Requirements for Operating Permits***

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Danville Compressor Station, defined under Title V as a "major source," was last issued a Title V permit on May 3, 2017. Proposed changes evaluated herein must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

**TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS**

There was no substantive change to the facility's potential to emit of non-criteria regulated pollutants as a result of the proposed changes evaluated herein.

**AIR QUALITY IMPACT ANALYSIS**

The proposed modification does not meet the definition of a "major modification" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

**MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS**

There were no substantive changes to the monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR) in the draft permit.

## **PERFORMANCE TESTING OF OPERATIONS**

There were no substantive changes to the performance testing requirements in the draft permit.

## **CHANGES TO PERMITS R13-3339**

The following substantive changes were made to Permit Number R13-3339:

- The Emissions Units Table 1.0 was updated with the increased throughput of liquids loading;
- The requirement mandating the use of a carbon filter under 8.1.1. was removed (due to the data showing only trace amounts of VOC being emitted from the storage tanks);
- The throughput limits under 8.1.2. and 8.1.3. were revised per the proposed changes evaluated herein.; and
- Requirement 8.3.2. was removed from the draft permit.

## **RECOMMENDATION TO DIRECTOR**

The information provided in permit application R13-2585E indicates that compliance with all applicable federal and state air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-2585E to Cranberry Pipeline Corporation for the proposed modification of the Danville Compressor Station located near Danville, Boone County, WV.

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Joe Kessler, PE  
Engineer

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Date

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