



west virginia department of environmental protection

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# DRAFT ENGINEERING EVALUATION / FACT SHEET

## BACKGROUND INFORMATION

Application No.: R13-2346C  
Plant ID No.: 039-00051  
Applicant: Dominion Transmission Inc.  
Facility Name: Cornwell Station  
Location: Clendenin, Kanawha County  
NAICS Code: 48621  
Application Type: Modification  
Received Date: July 12, 2012  
Engineer Assigned: Laura Jennings  
Fee Amount: \$1,000.00  
Date Received: July 16, 2012  
Complete Date: August 15, 2012  
Due Date: November 13, 2012  
Applicant Ad Date: July 20, 2012  
Newspaper: *The Charleston Gazette*  
UTM's: Easting: 476.19 km    Northing: 4259.58 km    Zone: 17  
Description: This permit modification application is for the proposed construction and operation of a new flare for the dehydration unit still. The proposed new flare will permanently replace the existing flare, Unit I.D. 0001, which is a control device for the glycol dehydration unit. As a result of this project, there will be a decrease in CO, SO<sub>2</sub>, and PM emissions and an increase of the following emissions: NO<sub>x</sub> 1.36 tpy, VOCs 12.9 tpy, and Total HAPs 1.55 tpy.

## DESCRIPTION OF PROCESS

Cornwell Station is a compressor facility that services a natural gas pipeline system. The purpose of the facility is to recompress natural gas flowing through a pipeline for transportation. The compressor engines [EN07 - EN19] at the facility receive natural gas from valves on pipelines and compresses it to enable further transportation in the pipeline. The Cornwell Compressor Station operates under Title V Permit Number R30-03900051-2007.

It should be noted that the compressor engines at the facility that required construction permits were permitted under R13-2175D and are not included in this permit modification application for R13-2346C.

This project includes the replacement of the flare as the control device for the Dehydration Unit Still. The previously flare was referenced as emission point ID DEHY01. The new flare is referenced as emission point ID F1.

The Emissions Unit Table for the changes associated with this modification is shown below as Table 1.

Table 1 - Emission Units Table

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type and Date of Change	Control Device
0002	F1	Dehydration unit flare; QT1, Q250	2012	10.0 MMBtu/hr	New	NA
0001	DEHY01	Dehydration Unit Still Column Flare	1999	2.2 MMBtu/hr	Removal	NA

#### SITE INSPECTION

Directions to the facility provided in the application:

Take I-79 to Exit 19 to WV State Route 4. Then take Route 4 North to Clendenin, cross the Elk River on Queen Shoals Road (Route 1). Turn left onto River Haven Road (Route 1/6), and proceed 2.5 miles to station.

Dominion's Cornwell site is known to the WVDAQ. A full on site inspection was conducted on May 18, 2012 by Eric Ray of the Compliance and Enforcement Group. They were found to be in compliance at the time of the inspection.

#### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions for NO<sub>x</sub>, CO, and VOC for the new flare are based on manufacturer's warranties and were provided in the flare specification sheet as part of the permit application. Emissions for PM total and SO<sub>2</sub> are based on AP-42 emission factors. All particulate matter is assumed to be less than 1.0 micrometer in diameter; therefore, PM Total, PM<sub>10</sub>, and PM<sub>2.5</sub> use the same emission factors.

Emissions for Greenhouse Gases were calculated based on procedures outlined in the *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry*, API, August 2009, Section 4.

The change in potential emissions of the existing dehydration unit [DEHY01B] are the result of an updated gas analysis and subsequent GlyCalc model. The updated sample was taken May 14, 2012 and the sample location was upstream of the dehydrater. GRI-GLYCalc Version 4.0 was used for the calculations in this permit application. There are no modifications to the dehydration unit except the replacement of the control device. The efficiency of the new flare is 95%. The input data to GlyCalc was verified by the writer.

There are no changes to the emissions from the reboiler stack [RBR01] associated with this permit application.

Table 2: Emissions Summary

Emission Point ID	Emission Unit ID	Emission Unit Description	APCD	Regulated Pollutant	Maximum Potential Uncontrolled Emissions		Maximum Potential Controlled Emissions	
					lb/hr	tpy	lb/hr	tpy
DEHY01B	005-01	Existing Dehydration Unit Still, Nalco	F1	VOC	72.75	318.66	3.64	15.93
				Benzene	1.94	8.48	0.10	0.42
				Ethylbenzene	<0.01	<0.01	<0.01	<0.01
				Hexane	1.25	5.46	0.06	0.27
				Toluene	4.11	18.00	0.21	0.90
				Xylene	4.71	20.62	0.24	1.03
				Total HAP	12.00	52.58	0.60	2.63
F1	0002	New Flare, Questor Technology, Q250	n/a	VOC	<0.01	0.03	<0.01	0.03
				NOX	0.46	2.02	0.46	2.02
				CO	0.03	0.13	0.03	0.13
				SO2	0.01	0.02	0.01	0.02
				PM	0.02	0.06	0.02	0.06
				CO <sub>2</sub> e	n/a	n/a	n/a	1665

For the sake of comparison, The new dehydrator flare [F1] is being compared against the previous dehydrator flare [DEHY01]. The existing dehydration unit still emissions were provided by the applicant and are based on accepted calculation methods. Only the VOC emissions from the existing dehydration unit still [ DEHY01B] were previously permitted.

Table 3: Change in Emissions:

Regulated Pollutant	Existing Dehydration Unit		Existing Regeneration Still Vent and New Flare F1		Change in Emissions as a result of this project	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CO	0.82	3.57	0.03	0.13	-0.79	-3.44
NOx	0.15	0.66	0.46	2.02	0.31	1.36
PM Total	0.02	0.07	0.02	0.06	0	-0.01
PM10	0.02	0.07	0.02	0.06	0	-0.01
PM2.5	0.02	0.07	0.02	0.06	0	-0.01
SO2	0.12	0.49	0.01	0.02	-0.11	-0.47
VOC	0.70	3.06	3.65	15.96	2.95	12.9
Benzene	0.04	0.16	0.10	0.42	0.06	0.26
Toluene	0.08	0.34	0.21	0.90	0.13	0.56
Ethylbenzene	0.00	0.00	0.01	0.01	0.01	0.01
n-Hexane	0.03	0.11	0.06	0.27	0.03	0.16
Xylene	0.11	0.47	0.24	1.03	0.13	0.56
Total HAPs	0.25	1.08	0.60	2.63	0.35	1.55

REGULATORY APPLICABILITY

STATE REGULATIONS:

45CSR6 CONTROL OF AIR POLLUTION FROM COMBUSTION OF REFUSE

The applicant is subject to 45CSR6 for the new flare F1. They have demonstrated compliance to section 4.1 because the PM emissions of 0.052 lb/hr are below the 45CSR6 limit of 0.69 lb/hr given the flow rate provided in the application. Calculations are provided below. Demonstration with the other requirements of the rule will be based on compliance with permit requirements.

The total flow rate to the flare includes the waste gas (6,230 scfh), a supplemental natural gas (500 scfh), and the pilot (63 scfh) for a total of 6,793 scfh 0.13 tons per hour.

No person shall cause, suffer, allow or permit particulate matter to be discharged from any incinerator into the open air in excess of the quantity

determined by use of the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is 5.43 for an incinerator with a capacity of less than 15,000 lbs/hr

Calculation for PM Emissions Limit:  $(5.43) \times (0.127 \text{ tons/hr}) = 0.69 \text{ lb/hr}$  limit

45CSR10

**D** TO PREVENT AND CONTROL AIR POLLUTION FROM THE EMISSION OF SULFUR OXIDES

The dehydration unit flare [F1] is subject to 45CSR10. It is exempt from Section 8 per 45CSR10 - 10.3 because it is natural gas fired.

The applicant demonstrates compliance with the Sulfur Dioxide Weight Emission Standard in 45CSR10- 3.1.e for a fuel burning type “b” because the SO<sub>2</sub> emissions are 0.004 lb/hr which is much less than the allowable limit of 31 lb/hr for a 10 MMBtu/hr unit.

45CSR13

**A** PERMITS FOR CONSTRUCTION, MODIFICATION, RELOCATION AND OPERATION OF STATIONARY SOURCES OF AIR POLLUTANTS, NOTIFICATION REQUIREMENTS, ADMINISTRATIVE UPDATES, TEMPORARY PERMITS, GENERAL PERMITS, PERMISSION TO COMMENCE CONSTRUCTION, AND PROCEDURES FOR EVALUATION

The applicant meets the definition of “modification” under 45CSR13-2.17.e for which the owner or operator of the source voluntarily chooses to obtain a modification permit pursuant to this rule, even though the owner or operator is not otherwise required to do so.

**F** The applicant has met the applicable requirements of this rule by publishing a Class I Legal Advertisement, paid the \$1000.00 application fee for a modification permit for a major stationary source and submitted a complete permit application.

45CSR14

**I** PERMITS FOR CONSTRUCTION AND MAJOR MODIFICATION OF MAJOR STATIONARY SOURCES OF AIR POLLUTION FOR THE PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

Dominion Transmission, Cornwell Compressor Station is located in Kanawha County, WV. Kanawha County was designated as nonattainment for the regulated pollutant PM<sub>2.5</sub> (annual) by the EPA. Kanawha County is in attainment for all other regulated pollutants.

Dominion's Cornwell Compressor Station is an existing “major” source with

regard to PSD with facility-wide emissions of at least one PSD pollutant greater than 250 tpy. According to the permit application, currently Cornwell Compressor Station has the potential to emit oxides of nitrogen (NOx), carbon monoxide (CO), and volatile organic compounds (VOC) in excess of 250 tons per year.

The proposed modifications to Cornwell Station have emissions well below the significant project thresholds of PSD as shown in the emissions section of this evaluation along with the trigger levels provided below. A complete analysis against baseline actual emissions was deemed not necessary for this project. The proposed change is not classified as a major modification and PSD regulations do not apply.

The proposed new GHG emission unit F1 is *not subject to regulation* as defined in 40 CFR §51.166(b)(48) to PSD rule 45CSR14 because they fall below 75,000 TPY for existing sources that are not otherwise subject to PSD.

Table 4: PSD Trigger Levels

Pollutant	Trigger Level (tpy)
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur Dioxide	40
Ozone (VOC)	40
Particulate Matter	25
PM10	15

45CSR19

PERMITS FOR CONSTRUCTION AND MAJOR MODIFICATION OF MAJOR STATIONARY SOURCES OF AIR POLLUTION WHICH CAUSE OR CONTRIBUTE TO NONATTAINMENT (NNSR)

Dominion Transmission, Cornwell Compressor Station is located in Kanawha County, WV. Kanawha County was designated as nonattainment for the regulated pollutant PM2.5 (annual) by the EPA. Kanawha County is in attainment for all other regulated pollutants.

The proposed modifications to Cornwell Station have emissions well below the significant project thresholds of NNSR as shown in the emissions section of this evaluation along with the trigger levels provided below. A complete analysis against baseline actual emissions was deemed not necessary for this project. The proposed change is not classified as a

major modification and NNSR regulations do not apply.

Table 5: NNSR Trigger Levels

Pollutant	Trigger Level (tpy)
PM2.5	10
PM2.5 (SO2 emissions)	40
PM2.5 (NOX emissions)	40

45CSR30 REQUIREMENTS FOR OPERATING PERMITS

The applicant is currently subject to 45CSR30. This application does not change the applicability. The facility is currently operating under permit R30-03900051-2012.

The applicant meets the definition of a major source for both criteria pollutants and hazardous air pollutants based on the information provided in the Title V permit Fact Sheet for the Final Renewal Permitting Action and in the permit application.

45CSR34 EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

There is no change in applicability as a result of the application. MACT, Subpart HH continues to apply and is described further in the Federal Regulations section.

FEDERAL REGULATIONS:

40 CFR PART 60,  
Subpart OOOO

STANDARDS OF PERFORMANCE FOR CRUDE OIL AND NATURAL GAS PRODUCTION, TRANSMISSION AND DISTRIBUTION

This subpart established 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 effective date of this Subpart is October 15, 2012.

The dehydration unit was installed in 1999 and therefore is not subject to this Subpart. The scope of this permit application is to replace the control device associated with the dehydration unit.

40 CFR 63,  
Subpart A  
§63.11

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES, Subpart A - General Provisions. Control device and work practice requirements (Flare MACT)

The applicant is subject to the requirements of the Flare MACT. This regulation specifies that the owners or operators using flares to comply with the provisions of Part 63 monitor these control devices to assure that they are operated and maintained in conformance with their designs. Compliance with §60.18 was demonstrated in the permit application. Compliance with §60.18 also demonstrates compliance with §63.11.

40 CFR 63,  
Subpart HH

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM OIL AND NATURAL GAS PRODUCTION FACILITIES

There is no change to the dehydration unit requested in this permit application. The dehydration plant continues to be subject to 40 CFR 63, Subpart HH because the facility processes natural gas prior to a natural gas processing plant. The existing Glycol Dehydration Unit is the only affected source. The facility is not located within an urbanized area plus offset (UA plus offset) or urban cluster (UC) boundary. The amendments to Subpart HH were published in the Federal Register August 16, 2012 and become effective October 15, 2012. The amendments to Subpart HH were reviewed for possible changes to existing permit requirements.

The dehydration unit meets the definition of a “small glycol dehydration unit” per §63.761. The glycol dehydration unit is located at a major source. The actual annual average natural gas flowrate is greater than 85,000 standard cubic meters per day; however the actual annual average benzene emissions are less than 0.90 Mg/yr, determined according to §63.772(b). It is considered an existing small glycol dehydration unit because construction commenced on or before August 23, 2011.

When the amendments to Subpart HH become effective on October 15, 2012, the “startups, shutdowns, and malfunctions” section §63.762 is being replaced with “affirmative defense for violations of emission standards during malfunction”. There are existing permit requirements associated with this section that will be replaced with the amended requirements.

General Standards (§63.764):

The Cornwell Station previously utilized the exemption to paragraph (c)(1) and (d) of §63.764 allowed in 40CFR60.764(e)(ii) for benzene emissions

less than 0.9 megagrams per year. This exemption no longer exists for major sources and only exempts area sources from the requirements of §63.764(d) with the records of the determination of the criteria maintained.

The glycol dehydration unit process vents will become subject to the requirements of §63.764(c)(1) and the requirements will include compliance with control requirements for process vents specified in §63.765, compliance with monitoring requirements specified in §63.773; and compliance with recordkeeping and reporting requirements of §63.774 and 63.775. The applicant will demonstrate compliance by complying with the permit conditions.

The “ancillary equipment” is not subject to the requirements of §63.764(c)(3) which is to comply with the requirements for equipment leaks specified in §63.769; however it does not meet the applicability requirements of §63.769(a) for “in VHAP service” and meets the exemption provided in §63.764(e)(2).

Glycol dehydration unit process vent standards (§63.765):  
63.765(b)(1)(iii) applies and (b)(2) applies. BTEX emissions from each existing small glycol dehydration unit process vent are limited, as determined by Equation 1 of this section. Limits must be met in accordance with one of the alternatives specified in (b)(1)(iii)(A) through (D) of this section.

As an alternative to the requirements of paragraph (b) of this section, the applicant may comply with of the requirements in paragraphs (c)(1) through (3) of this section.

Control equipment requirements (§63.771):  
This section is applicable. The applicant is using the new flare [F1] to comply according to information provided in the application. Section 63.771(c) provides the closed vent system requirements and section §63.771(f) provides the control device requirements for small glycol dehydration units. The applicant will be in compliance with §63.771(f) because they state in the application that the flare will be designed according to the requirements of §63.11.

Test methods, compliance procedures, and compliance demonstrations (§63.772):  
This section is applicable depending on the compliance method chosen by the applicant to the process vent standards in §63.765. The applicant is using a control device to comply with the emission limit in §63.765(b)(1)(iii) so the requirements of paragraph (e) of this section apply and compliance demonstrated using the methods specified in paragraph (f) of this section.

Inspection and Monitoring requirements (§63.773):

This section may be applicable depending on the compliance method chosen by the applicant to the process vent standards in §63.765. If the applicant will be using air emission controls to comply, this section will be applicable.

The table provided below provides a review of the existing permit requirements associated with MACT, Subpart HH.

Table 4: MACT, Subpart HH Review of existing permit requirements

Permit Section	Requirement	Subpart HH reference	Does the amendment change the requirement?	New requirement
A8	Benzene emission limit meets exemption criteria listed in 40 CFR §63.764(e)(ii)	§63.764(e)(ii)	yes	§63.765(b)(1)(iii); §63.765(b)(2); §63.771(c); §63.771(f);
	Records documenting the actual average benzene emissions are to be determined in accordance with §63.772(b)(2)	§63.772(b)(2)	yes	§63.774
	Should actual annual benzene emissions exceed 2,000 pounds.....	§63.764(e)(ii)	yes	n/a
A9	The permittee is exempted from preparing and maintaining the dehydration plants SSMP	§63.762(e)	yes	§63.762
A10	The dehy still column flare shall be designed and operated according to 40 CFR 63.11 (b) and therefore shall be exempt from control device performance testing per 40 CFR 63.772(e)(2)(i)	§63.772(e)(2)(i)	no	§63.772(e)(1)(i) and §63.772(e)(2)
A11	The total volatile hazardous air pollutant concentration in the process stream shall be < 10% by wt. And therefore the facility shall be exempt from equipment leak monitoring	63.764 (e)(2) and 63.774 (d)(2)	no	n/a

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There are no new hazardous air pollutants associated with this modification.

## AIR QUALITY IMPACT ANALYSIS

The proposed project does not meet the definition of a major modification according to the definitions in 45CSR14 and 45CSR19; therefore, modeling is not required for this permit application.

## MONITORING OF OPERATIONS

- Opacity monitoring requirements from 45CSR6 apply to the new flare F1.
- The new dehydrator still column flare [F1] will use automatic re-ignition, the pilot flame will be equipped with a monitor, will follow the visible emissions monitoring from §63.11, and will follow the monitoring, recordkeeping, and reporting requirements required by 40 CFR 63, Subpart HH.

## CHANGES TO PERMIT R13-2346B

- General updates including permit versions and current officials, DAQ address's, etc.
- Changed to current permit template with this modification. The table below provides a cross reference to the numbering changes for Sections A and B. The new template incorporates any of the previous requirements of Section C.

R13-2346B Section A	R13-2346C Section	R13-2346B Section B	R13-2346C Section
1	6.1.1	1	new template
2	6.1.2	2	new template
3	6.1.3	3	5.1.4
4	n/a	4	new template
5	5.1.2	5	6.4.1
6	1.0 and 5.1.1	6	5.4.1
7	5.1.3		
8	5.1.5		
9	deleted		
10	5.1.15		
11	5.1.8		
12	5.1.1		

13	5.1.15	
14	5.4.2	

- Added rule references if not previously included
- Renamed the reboiler emission point ID from [DEHY OA] to [RB01] for consistency with the Title V permit.
- Specific requirement A4 was removed because the equipment was previously removed and the requirement is no longer necessary.
- Modified or removed language related to the MACT, Subpart HH exemption requirements because the exemption expires on October 15, 2012, refer to Table 4 in the regulatory section for details.
- Added new MACT, Subpart HH requirements that will become effective October 15, 2012.
- 5.1.15 - corrected reference from 40 CFR 60.18 to 40 CFR 63.11.
- Section 5.4.1 and 5.4.2 - removed the requirement that the records be certified.
- Section 6.4.1 - removed the reference to an example form because one did not exist and that the record must be certified.

RECOMMENDATION TO DIRECTOR

It is the recommendation of the writer that permit R13-2346C be granted to Dominion Transmission, Inc. Cornwell Station located in Clendenin, Kanawha County, WV and having facility ID 039-00051. The basis of the recommendation is that from the information provided in the permit application, along with any supplemental information that was provided, the applicant will be in compliance with all applicable state and federal air pollutant regulations.

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Laura M. Jennings  
Permit Engineer

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Date