



April 17, 2015

BY: U.S. CERTIFIED MAIL, RETURN RECEIPT REQUESTED

7014 3490 0000 0448 3702

William F. Durham
Director, Division of Air Quality
WVDEP
601 57th Street
Charleston, WV 25304

RE: Dominion Transmission, Inc. – General Permit Application (G35-A)
Maxwell Compressor Station

Dear Mr. Durham:

Enclosed are one complete original and two (2) cd copies of a G35-A General Permit application for the proposed replacement of the existing Ingersoll Rand 440 bhp compressor engine (CE-1) with a Caterpillar 515 bhp compressor engine (CE-2) at Dominion Transmission, Inc.'s Maxwell Compressor Station in Doddridge County, WV. In addition, the potential to emit calculations for the dehydration unit have been updated to represent actual operations at worst case scenarios.

The public notice affidavit will be submitted to WVDEP once it is received from the newspaper.

If you require any additional information, please contact Rebekah Remick at (804) 273-3536 or via email at Rebekah.J.Remick@dom.com.

Sincerely,

A handwritten signature in blue ink that reads "Amanda B. Tornabene".

Amanda B. Tornabene
Director, Gas Environmental Services

DEP – The original and copies

Please scan signed original/attachments and name file as:

Maxwell – G35-A Application for 515 bhp Engine and Updated Dehy Limits - April 2015

Please upload to Documentum

Facility:	Maxwell Compressor Station
Title:	Maxwell – G35-A Application for 515 bhp Engine and Updated Dehy Limits - April 2015
Document Type:	Permit Applications
Environmental Program:	Air – State Permits

Send document link electronically to:

Pam Faggert
Mandy Tornabene
Paul Dickens
Becky Remick
Abby Credicott
Brian Sheppard
Phyllis Hinterer
Bill Morrison
Tyler Moyers
Shawn Davis
Justin Lowther
Scott Kingston

**DOMINION TRANSMISSION, INC.
MAXWELL COMPRESSOR STATION**

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Application for General Permit Registration to Construct, Modify, Relocate or Administratively Update a Stationary Source of Air Pollutants

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**Note – There are no Attachments C, H, K, M, N, and O for this permit application



WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF AIR QUALITY
 601 57th Street, SE
 Charleston, WV 25304
 Phone: (304) 926-0475 • www.dep.wv.gov/daq

APPLICATION FOR GENERAL PERMIT REGISTRATION
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE
 A STATIONARY SOURCE OF AIR POLLUTANTS

CONSTRUCTION MODIFICATION RELOCATION CLASS I ADMINISTRATIVE UPDATE
 X CLASS II ADMINISTRATIVE UPDATE

CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:

- | | |
|---|---|
| G10-D – Coal Preparation and Handling
G20-B – Hot Mix Asphalt
G30-D – Natural Gas Compressor Stations
G33-A – Spark Ignition Internal Combustion Engines
X G35-A – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | G40-C – Nonmetallic Minerals Processing
G50-B – Concrete Batch
G60-C – Class II Emergency Generator
G65-C – Class I Emergency Generator
G70-A – Class II Oil and Natural Gas Production Facility |
|---|---|

SECTION I. GENERAL INFORMATION

1. Name of applicant (as registered with the WV Secretary of State's Office): Dominion Transmission, Inc.	2. Federal Employer ID No. (FEIN): 550629203
3. Applicant's mailing address: 445 West Main Street Clarksburg, WV 26301	4. Applicant's physical address: County Route 19/11 Porto Rico, WV 26411
5. If applicant is a subsidiary corporation, please provide the name of parent corporation: N/A	
6. WV BUSINESS REGISTRATION. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
– IF YES , provide a copy of the Certificate of Incorporation/ Organization / Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A . – IF NO , provide a copy of the Certificate of Authority / Authority of LLC / Registration (one page) including any name change amendments or other Business Certificate as Attachment A .	

SECTION II. FACILITY INFORMATION

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): Natural Gas Compressor Station	8a. Standard Industrial Classification (SIC) code: 4922	AND	8b. North American Industry System (NAICS) code: 486210
9. DAQ Plant ID No. (for existing facilities only): 017-00005	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only): G35-A031A		

A: PRIMARY OPERATING SITE INFORMATION

11A. Facility name of primary operating site: Maxwell Compressor Station		12A. Address of primary operating site: Mailing: <u>445 West Main Street, Clarksburg, WV 26301</u> Physical: <u>Co. Route 19/11 (Porto Rico Rd), Porto Rico, WV 26411</u>	
13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? – IF YES , please explain: <u>Owns the site</u> – IF NO , YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
14A. – For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; – For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F . From US Route 50 at West Union, take Route 18 S for 9.9 miles. Turn right onto County Route 54 (Porto Rico Road). Travel 4.6 miles, station located on left.			
15A. Nearest city or town: Porto Rico, WV	16A. County: Doddridge	17A. UTM Coordinates: Northing (KM): <u>4336.751</u> Easting (KM): <u>520.530</u> Zone: <u>17</u>	
18A. Briefly describe the proposed new operation or change (s) to the facility: Replace existing pre-1952 Ingersoll Rand 440 bhp compressor engine with a 2001 Caterpillar 515 bhp compressor engine.		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: <u>39.181782</u> Longitude: <u>-80.7622718</u>	

B: 1ST ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)

11B. Name of 1 st alternate operating site: N/A		12B. Address of 1 st alternate operating site: Mailing: N/A Physical: N/A	
13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? – IF YES , please explain: <u>N/A</u> – IF NO , YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		<input type="checkbox"/> YES <input type="checkbox"/> NO	
14B. – For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; – For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F . N/A			
15B. Nearest city or town: N/A	16B. County: N/A	17B. UTM Coordinates: Northing (KM): N/A Easting (KM): N/A Zone: N/A	

18B. Briefly describe the proposed new operation or change (s) to the facility: N/A	19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: N/A Longitude: N/A
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C: 2ND ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):

11C. Name of 2 nd alternate operating site: N/A	12C. Address of 2 nd alternate operating site: Mailing: N/A Physical: N/A
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13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? – IF YES , please explain: N/A – IF NO , YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.	YES NO
--	---------------

14C. – For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; – For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F . N/A
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15C. Nearest city or town: N/A	16C. County: N/A	17C. UTM Coordinates: Northing (KM): N/A Easting (KM): N/A Zone: N/A
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18C. Briefly describe the proposed new operation or change (s) to the facility: N/A	19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: N/A Longitude: N/A
--	--

20. Provide the date of anticipated installation or change: 6/01/2015 <input type="checkbox"/> If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: : ____/____/____	21. Date of anticipated Start-up if registration is granted: 7/17/15
--	---

22. Provide maximum projected Operating Schedule of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation). Hours per day <u>24</u> Days per week <u>7</u> Weeks per year <u>52</u> Percentage of operation <u>100%</u>
--

SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

23. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13).
24. Include a Table of Contents as the first page of your application package.
All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.

25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.

- ATTACHMENT A : CURRENT BUSINESS CERTIFICATE
- ATTACHMENT B: PROCESS DESCRIPTION
- ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS
- ATTACHMENT D: PROCESS FLOW DIAGRAM
- ATTACHMENT E: PLOT PLAN
- ATTACHMENT F: AREA MAP
- ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM
- ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL
- ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE
- ATTACHMENT M: SITING CRITERIA WAIVER
- ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS)
- ATTACHMENT O: EMISSIONS SUMMARY SHEETS
- OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.)

Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

X I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

I certify that I am the Owner and Proprietor

I hereby certify that (please print or type) _____ is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature Brian C. Sheppard 04/09/15
(please use blue ink) Responsible Official Date

Name & Title Brian Sheppard, Vice President Pipeline Operations
(please print or type)

Signature _____
(please use blue ink) Authorized Representative (if applicable) Date

Applicant's Name Dominion Transmission, Inc.

Phone & Fax 304-627-3733 304-627-3323
Phone Fax

Email Brian.C.Sheppard@dom.com

Attachment A

Current Business Certificate

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**DOMINION TRANSMISSION INC
445 W MAIN ST
CLARKSBURG, WV 26301-2843**

BUSINESS REGISTRATION ACCOUNT NUMBER: **1038-3470**

This certificate is issued on: **06/8/2011**

*This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code*

*The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.*

This certificate is not transferrable and must be displayed at the location for which issued.
This certificate shall be permanent until cessation of the business for which the certificate of registration
was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new
certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of
this certificate displayed at every job site within West Virginia.

Attachment B

Process Description

PROCESS DESCRIPTION

Maxwell Station is a natural gas compressor station used to compress gas for transportation through a pipeline system. This purpose of this permit application is for the replacement of the existing Ingersoll Rand 440 bhp compressor engine with a Caterpillar 515 bhp compressor engine.

In addition, the potential to emit (PTE) calculations for the dehydration unit have been updated to represent actual operations at worst case scenarios. A new GLYCalc run has been processed and a 20% safety factor has been included to the VOC and HAP limits to help with variability in operating parameters and wet gas samples.

For example: VOC

GLYCalc = 16.4940 tons/yr

PTE Limits = 16.4940 * 1.2 = 19.79 tons VOC/yr

New Source Performance Standards (NSPS) Subpart JJJJ

The natural gas fired Caterpillar 515 bhp compressor engine is not subject to this Subpart as it was manufactured before the applicability date.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ

The natural gas fired Caterpillar 515 bhp compressor engine is subject to this Subpart. The Caterpillar 515 bhp compressor engine has been determined to meet the definition of "remote stationary RICE" as defined under NESHAP Subpart ZZZZ in 40 CFR 63.6675. An analysis was conducted using maps that were developed for these stations by Dominion's Mapping department. These maps identify Class I pipe per the Department of Transportation definition listed in 49 CFR 192.5 as having 10 or fewer buildings intended for human occupancy within 220 yards on either side of the centerline of any continuous 1-mile length of pipe (see remote map in Attachment G)

West Virginia Minor Source Regulations (R13)

The addition of the Caterpillar 515 bhp compressor engine and the update to the dehydration unit emissions does not trigger permitting as potential to emit calculations are below exemption thresholds of:

- 6 lbs/hr and 10 tons/yr, or
- 144 lbs/day, or
- 2 lbs/hr or 5 tons/yr of HAPs

Pollutant	Current PTE		New PTE with Caterpillar 515 bhp engine and Updated Dehy Limits		Change in PTE Emissions		
	(lbs/hr)	(tons/yr)	(lbs/hr)	(tons/yr)	(lbs/hr)	(lbs/day)	(tons/yr)
NOx	8.84	38.48	2.36	10.1	-6.48	-155.52	-28.38
CO	15.54	64.83	2.51	7.77	-13.03	-312.72	-57.06
VOC	2.0	7.15	5.32	21.74	+3.32	+79.68	+14.59
SO ₂	0.04	0.04	<0.01	0.01	-0.03	-0.72	-0.03
PM ₁₀	0.09	0.19	0.04	0.01	-0.05	-1.2	-0.18
Formaldehyde	0.14	0.38	0.29	1.02	+0.15	+3.6	+0.64

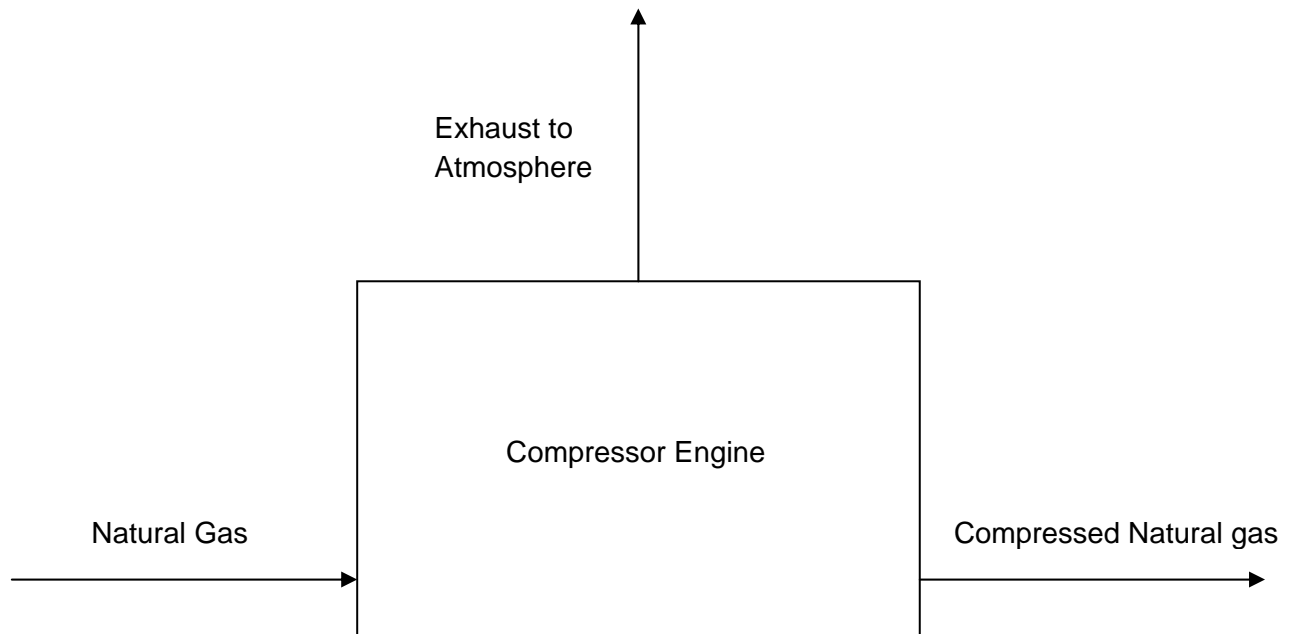
Therefore, this permit action will be a Class II Administrative Amendment to the existing general permit (G35 – A031A).

Attachment D

Process Flow Diagram

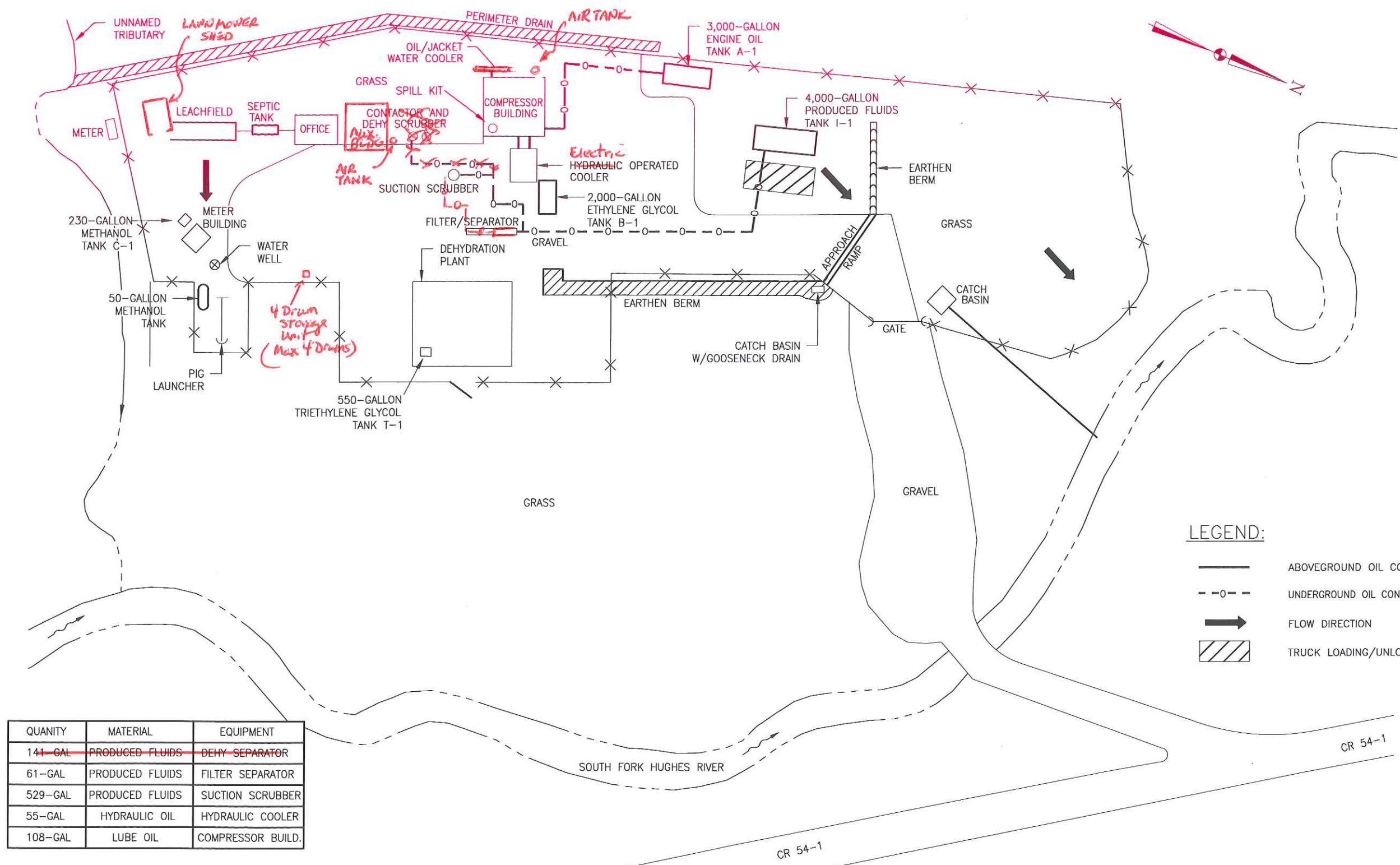
Process Flow Diagram for the Compressor Engine (CE-2)

Maxwell Compressor Station



Attachment E

Plot Plan



LEGEND:

	ABOVEGROUND OIL CONTAINING PIPE
	UNDERGROUND OIL CONTAINING PIPE
	FLOW DIRECTION
	TRUCK LOADING/UNLOADING

QUANTITY	MATERIAL	EQUIPMENT
141-GAL	PRODUCED FLUIDS	DEHY SEPARATOR
61-GAL	PRODUCED FLUIDS	FILTER SEPARATOR
529-GAL	PRODUCED FLUIDS	SUCTION SCRUBBER
55-GAL	HYDRAULIC OIL	HYDRAULIC COOLER
108-GAL	LUBE OIL	COMPRESSOR BUILD.

SYM.	DATE	BY	REVISION DESCRIPTION	PRJ/TSK	APP.	SCALE	N.T.S.	DATE
						DRAWN	DJF	9/14/07
						CHECKED	RRE/JSS	
2	5/25/10	JDB	UPDATED PER RUSS EVANS MARK-UPS					
1	4/16/10	JDB	UPDATED PER RUSS EVANS MARK-UPS					

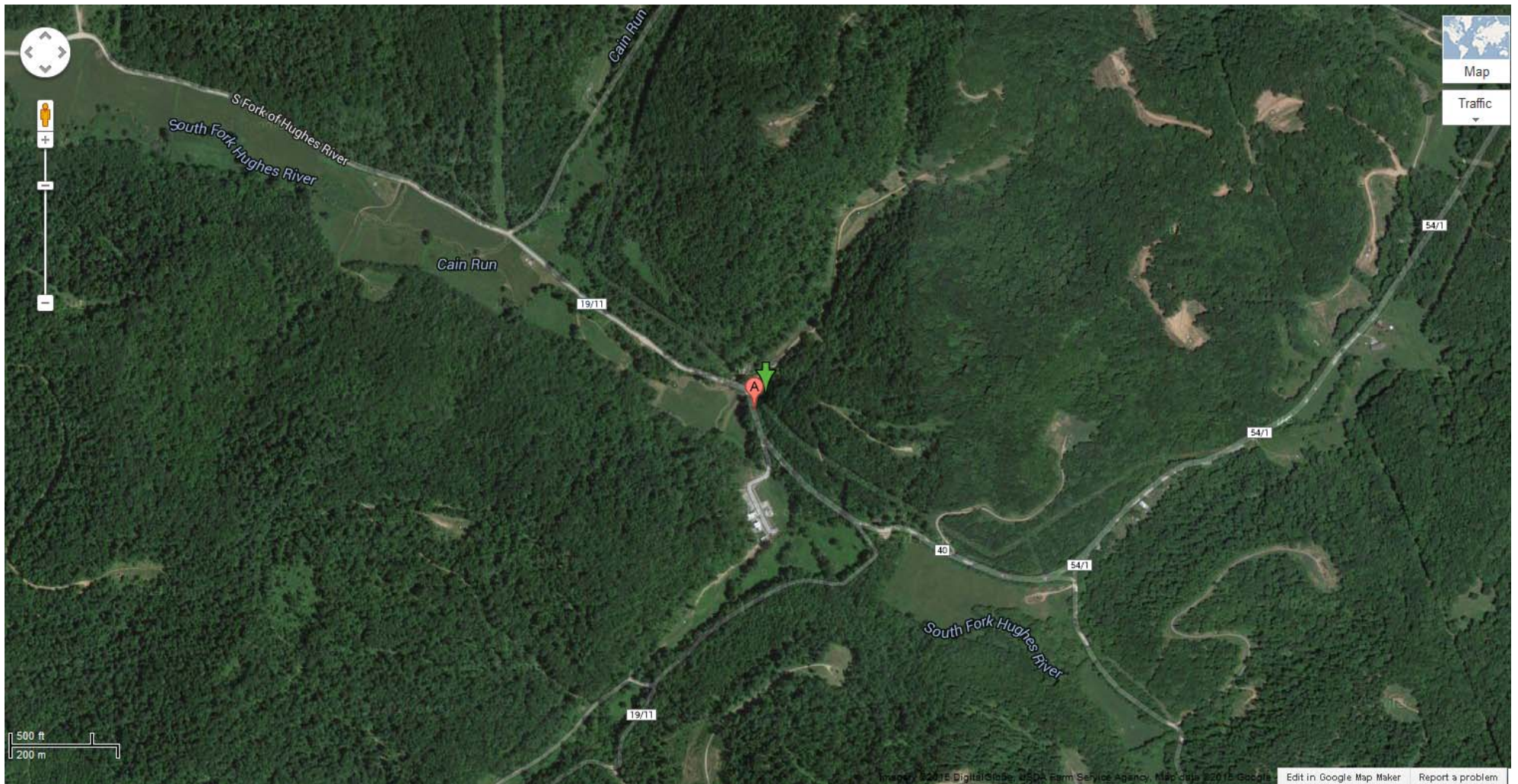
Dominion Transmission, Inc.
 445 West Main St. Clarkeburg, West Virginia 26301 / Phone: (304) 623-8000

TITLE: MAXWELL COMPRESSOR STATION
 DODDRIDGE COUNTY, WEST VIRGINIA
 ENVIRONMENTAL EMERGENCY SITE PLAN

DIR:	GROUP:	DWG. NO.:	REV.:
FILE:	PRJ/TSK:	PD X3201A	2

Attachment F

Area Map



Attachment G

Equipment Data Sheets and Registration Section
Applicability Form

G35-A REGISTRATION APPLICATION FORMS

General Permit G35-A Registration Section Applicability Form

General Permit G35-A was developed to allow qualified registrants to seek registration for a variety of sources. These sources include internal combustion engines, boilers, reboilers, line heaters, tanks, emergency generators, dehydration units not subject to MACT standards, dehydration units not subject to MACT standards and being controlled by a flare control device, dehydration units not subject to MACT standards and being controlled by recycling the dehydration unit back to flame zone of reboiler, dehydration units not subject to MACT standards being controlled by a thermal oxidizer, and permit exemptions including the less than 1 ton/year benzene exemption, the 40CFR63 Subpart HH - Annual Average Flow of Gas Exemption (3 mmscf/day), and the 40CFR63 Subpart HHH - Annual Average Flow of Gas Exemption (10 mmscf/day). All registered facilities will be subject to Sections 1.0, 1.1, 2.0, 3.0, and 4.0.

General Permit G35-A allows the registrant to choose which sections of the permit that they wish to seek registration under. Therefore, please mark which sections that you are applying for registration under. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

- | | | |
|------------|---|-------------------------------------|
| Section 5 | Reciprocating Internal Combustion Engines (R.I.C.E.)* | <input checked="" type="checkbox"/> |
| Section 6 | Boilers, Reboilers, and Line Heaters | <input checked="" type="checkbox"/> |
| Section 7 | Tanks | <input type="checkbox"/> |
| Section 8 | Emergency Generators | <input checked="" type="checkbox"/> |
| Section 9 | Dehydration Units Not Subject to MACT Standards | <input type="checkbox"/> |
| Section 10 | Dehydration Units Not Subject to MACT Standards and being controlled by a flare control device | <input checked="" type="checkbox"/> |
| Section 11 | Dehydration Units Not Subject to MACT Standards being controlled by recycling the dehydration unit back to the flame zone of the reboiler | <input type="checkbox"/> |
| Section 12 | Dehydration Units Not Subject to MACT Standards and being controlled by a thermal oxidizer | <input type="checkbox"/> |
| Section 13 | Permit Exemption (Less than 1 ton/year of benzene exemption) | <input checked="" type="checkbox"/> |
| Section 14 | Permit Exemption (40CFR63 Subpart HH – Annual average flow of gas exemption (3 mmscf/day)) | <input type="checkbox"/> |
| Section 15 | Permit Exemption (40CFR63 Subpart HHH – Annual average flow of gas exemption (10 mmscf/day)) | <input type="checkbox"/> |
| Section 16 | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40CFR60 Subpart JJJJ) | <input checked="" type="checkbox"/> |

*** Affected facilities that are subject to Section 5 may also be subject to Section 16. Therefore, if the applicant is seeking registration under both sections, please select both.**

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number ¹		CE-2		EG01		EG02	
Engine Manufacturer and Model		Caterpillar G3508 LE		Cummins GM8.1		Cummins GM8.1	
Manufacturer's Rated bhp/rpm		515 bhp @1200 rpm		192.5		192.5	
Source Status ²		NS		ES		ES	
Date Installed/Modified/Removed ³		2015		2011		2011	
Engine Manufactured/Reconstruction Date ⁴		9/2001		2011		2011	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No) ⁵		No		Yes		Yes	
Engine, Fuel and Combustion Data	Engine Type ⁶	LB4S		RB4S		RB4S	
	APCD Type ⁷	N/A		NSCR		NSCR	
	Fuel Type ⁸	PQ		PQ		PQ	
	H ₂ S (gr/100 scf)	0.25		0.25		0.25	
	Operating bhp/rpm	515 bhp @1200 rpm		192.5		192.5	
	BSFC (Btu/bhp-hr)	8,370		8,660		8,660	
	Fuel throughput (ft ³ /hr)	4,311		1,667		1,667	
	Fuel throughput (MMft ³ /yr)	37.8		0.84		0.84	
	Operation (hrs/yr)	8,760		500		500	
Reference ⁹	Potential Emissions ¹⁰	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO _x	2.27	9.95	0.03	0.01	0.03	0.01
MD	CO	1.70	7.46	0.39	0.10	0.39	0.10
MD	VOC	0.42	1.84	0.19	0.05	0.19	0.05
AP	SO ₂	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
AP	PM ₁₀	<0.01	<0.01	0.02	<0.01	0.02	<0.01
AP	Formaldehyde	0.23	1.0	0.03	0.01	0.03	0.01

1. Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

NS Construction of New Source (installation)	ES Existing Source
MS Modification of Existing Source	RS Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.
4. Enter the date that the engine was manufactured, modified or reconstructed.
5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

7. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

8. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
----	------------------------------	----	-----------------

9. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

10. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

NATURAL GAS FIRED BOILER/LINE HEATER DATA SHEET

Source ID # ¹	Status ²	Design Heat Input (mmBtu/hr) ³	Hours of Operation (hrs/yr) ⁴	Fuel Heating Value (Btu/scf) ⁵	
RBV-1	EXIST	0.3	8,760	1,000	

1. Enter the appropriate Source Identification Numbers (Source ID #) for each boiler or line heater located at the compressor station. Boilers should be designated BLR-1, BLR-2, BLR-3, etc. Heaters or Line Heaters should be designated HTR-1, HTR-2, HTR-3, etc. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.
2. Enter the Status for each boiler or line heater using the following:

EXIST Existing Equipment	NEW Installation of New Equipment
REM Equipment Removed	
3. Enter boiler or line heater design heat input in mmBtu/hr.
4. Enter the annual hours of operation in hours/year for each boiler or line heater.
5. Enter the fuel heating value in Btu/standard cubic foot.

STORAGE TANK DATA SHEET

Source ID # ¹	Status ²	Content ³	Volume ⁴	Dia ⁵	Throughput ⁶	Orientation ⁷	Liquid Height ⁸
N/A							

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:

EXIST Existing Equipment	NEW Installation of New Equipment
REM Equipment Removed	
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, etc.
4. Enter storage tank volume in gallons.
5. Enter storage tank diameter in feet.
6. Enter storage tank throughput in gallons per year.
7. Enter storage tank orientation using the following:

VERT Vertical Tank	HORZ Horizontal Tank
--------------------	----------------------
8. Enter storage tank average liquid height in feet.

NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		Natco	
		Max Dry Gas Flow Rate (mmscf/day)		4.25	
		Design Heat Input (mmBtu/hr)		0.3	
		Design Type (DEG or TEG)		TEG	
		Source Status ²		ES	
		Date Installed/Modified/Removed ³		8/01/2009	
		Regenerator Still Vent APCD ⁴		FL	
		Fuel HV (Btu/scf)		1,000	
		H ₂ S Content (gr/100 scf)		0.25	
		Operation (hrs/yr)		8,760	
Source ID # ¹	Vent	Reference ⁵	Potential Emissions ⁶	lbs/hr	tons/yr
RBV-1	Reboiler Vent	AP	NO _x	0.03	0.13
		AP	CO	0.03	0.11
		AP	VOC	<0.01	0.01
		AP	SO ₂	<0.01	<0.01
		AP	PM ₁₀	<0.01	0.01
RSV-1	Glycol Regenerator Still Vent	GR	VOC	4.52	19.79
		GR	Benzene	0.02	0.09
		GR	Ethylbenzene	0.03	0.14
		GR	Toluene	0.05	0.23
		GR	Xylenes	0.09	0.41
		GR	n-Hexane	0.05	0.24

1. Enter the appropriate Source Identification Numbers for the glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent. The glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a *Glycol Dehydration Unit Data Sheet* shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

2. Enter the Source Status using the following codes:

NS Construction of New Source	ES Existing Source
MS Modification of Existing Source	RS Removal of Source

3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes:

NA None	CD Condenser
FL Flare	CC Condenser/Combustion Combination
TO Thermal Oxidizer	

5. Enter the Potential Emissions Data Reference designation using the following codes:

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-GLYCalc™	OT	Other _____	(please list)

6. Enter the Reboiler Vent and glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc *Aggregate Calculations Report* to this *Glycol Dehydration Unit Data Sheet(s)*. This PTE data shall be incorporated in the *Emissions Summary Sheet*.

Include a copy of the GRI-GLYCalc™ analysis. This includes a printout of the aggregate calculations report, which shall include emissions reports, equipment reports, and stream reports.

***An explanation of input parameters and examples, when using GRI-GLYCalc™ is available on our website.**

West Virginia Department of Environmental Protection

DIVISION OF AIR QUALITY : (304) 926-0475
WEB PAGE: <http://www.wvdep.org>

Division of Air Quality

40 CFR Part 63; Subpart HH & HHH Registration Form

Complete this form for any oil and natural gas production or natural gas transmission and storage facility that uses an affected unit under HH/HHH, whether subject or not.

Section A: Facility Description			
Affected facility actual annual average natural gas throughput (scf/day): 4,250,000			
Affected facility actual annual average hydrocarbon liquid throughput: (bbl/day): N/A			
The affected facility processes, upgrades, or stores hydrocarbon liquids prior to custody transfer.	Yes	<input checked="" type="checkbox"/> No	
The affected facility processes, upgrades, or stores natural gas prior to the point at which natural gas (NG) enters the NG transmission and storage source category or is delivered to the end user.	<input checked="" type="checkbox"/> Yes	No	
The affected facility is: <input checked="" type="checkbox"/> prior to a NG processing plant <input type="checkbox"/> a NG processing plant <input type="checkbox"/> prior to the point of custody transfer and there is no NG processing plant			
The affected facility transports or stores natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company).	Yes	<input checked="" type="checkbox"/> No	
The affected facility exclusively processes, stores, or transfers black oil.	Yes	<input checked="" type="checkbox"/> No	
Initial producing gas-to-oil ratio (GOR): _____scf/bbl API gravity: _____degrees			
Section B: Dehydration Unit (if applicable) ¹			
Description: Dehydration unit with flare			
Date of Installation: Existing	Annual Operating Hours: 8,760	Burner rating (MMbtu/hr): 4.0	
Exhaust Stack Height (ft): 25.5	Stack Diameter (ft): 1.5	Stack Temp. (°F):	
Glycol Type: <input checked="" type="checkbox"/> TEG <input type="checkbox"/> EG <input type="checkbox"/> Other:			
Glycol Pump Type: <input checked="" type="checkbox"/> Electric <input type="checkbox"/> Gas If gas, what is the volume ratio? _____ACFM/gpm			
Condenser installed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Exit Temp. _____°F Condenser Pressure _____psig			
Incinerator/flare installed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Destruction Eff. <u>95</u> %			
Other controls installed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe:			
Wet Gas ² : Gas Temp.: <u>110</u> °F Gas Pressure <u>365</u> psig (Upstream of Contact Tower) Saturated Gas? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, water content _____ lb/MMSCF			
Dry Gas: Gas Flowrate(MMSCFD) Actual _____ Design <u>4.3</u> (Downstream of Contact Tower) Water Content <u>7.0</u> lb/MMSCF			
Lean Glycol: Circulation rate (gpm) Actual ³ _____ Maximum ⁴ <u>3.0</u> Pump make/model:			
Glycol Flash Tank (if applicable): Temp.: <u>160</u> °F Pressure <u>125</u> psig Vented? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, describe vapor control:			
Stripping Gas (if applicable): Source of gas: Dry Gas Rate <u>65</u> scfm			

Please attach the following required dehydration unit information:

1. System map indicating the chain of custody information. See Page 43 of this document for an example of a gas flow schematic. It is not intended that the applicant provide this level of detail for all sources. The level of detail that is necessary is to establish where the custody transfer points are located. This can be accomplished by submitting a process flow diagram indicating custody transfer points and the natural gas flow. However, the DAQ reserves the right to request more detailed information in order to make the necessary decisions.
2. Extended gas analysis from the Wet Gas Stream including mole percents of C₁-C₈, benzene, ethylbenzene, toluene, xylene and n-Hexane, using Gas Processors Association (GPA) 2286 (or similar). A sample should be taken from the inlet gas line, downstream from any inlet separator, and using a manifold to remove entrained liquids from the sample and a probe to collect the sample from the center of the gas line. GPA standard 2166 reference method or a modified version of EPA Method TO-14, (or similar) should be used.
3. GRI-GLYCalc Ver. 3.0 aggregate report based on maximum Lean Glycol circulation rate and maximum throughput.
4. Detailed calculations of gas or hydrocarbon flow rate.

Section C: Facility NESHAPS Subpart HH/HHH status

	<input checked="" type="checkbox"/> Subject to Subpart HH (benzene exemption)	
Affected facility	<input type="checkbox"/> Subject to Subpart HHH	
status:	<input type="checkbox"/> Not Subject	<input type="checkbox"/> < 10/25 TPY
(choose only one)	because:	<input type="checkbox"/> Affected facility exclusively handles black oil
		<input type="checkbox"/> The facility wide actual annual average NG throughput is < 650 thousand scf/day and facility wide actual annual average hydrocarbon liquid is < 250 bpd
		<input type="checkbox"/> No affected source is present

Flare System Control Device Sheet

IMPORTANT: READ THE INSTRUCTIONS ACCOMPANYING THIS FORM BEFORE COMPLETING.

General Information

1) Control Device ID#: F-1	2) Installation Date: Existing <input type="checkbox"/> New
3) Maximum Flare Rated Capacity: 4.0 MMBtu/hr	4) Maximum Pilot Rated Capacity: 0.43 MMBtu/hr

5) Emission Unit Information

List the emission units whose emissions are controlled by this flare:
(Emission Point ID#: F-1)

Emission Unit ID#	Emission Source Description	Installation Date
RSV-1	Dehy Still Vent	Existing <input type="checkbox"/> NEW
		<input type="checkbox"/> NEW
		<input type="checkbox"/> NEW
		<input type="checkbox"/> NEW
		<input type="checkbox"/> NEW

If this flare controls emissions from more than five emission units, please attach additional pages.

6) Stack Information N/A

Flare Height	Tip Diameter	Stack Discharge	Assist Type	Exit Velocity of Gas	Heat Content of Waste Gas + Any Auxiliary Fuel
25.5 ft	1.5 ft	<input type="checkbox"/> Horizontal <input checked="" type="checkbox"/> Vertical <input type="checkbox"/> Vertical with Rain cap	<input type="checkbox"/> Steam <input type="checkbox"/> Air <input type="checkbox"/> Pressure <input checked="" type="checkbox"/> Non	0.1 ft/s	728.6 Btu/scf

7) Flare Fuel Information

Type/Grade of Fuel Combusted	Maximum Fuel Capacity (include units)	Heat Content (include units)	Fuel Contents	Requested Operating Limitation (include units)
Regen Gas	48.09 MMcf/yr	728.6 Btu/scf	% Sulfur: N/A	
			% Ash: N/A	

8) Pilot Fuel Information

Type/Grade of Fuel Combusted	Maximum Fuel Capacity (include units)	Heat Content (include units)	Fuel Contents	Requested Operating Limitation (include units)
PQ	3.29 MMcf/yr	1,000 Btu/scf	% Sulfur: N/A	
			% Ash: N/A	

If either the Flare or Pilot will combust more than one type of fuel, attach additional information.

Flare System Control Device Sheet (continued)

9) Control Information			
Pollutant(s) Controlled	% Control Efficiency	Pollutant(s) Controlled	% Control Efficiency
VOC	95		
Benzene	95		
Toluene	95		
n-Hexane	95		
Xylene	95		
If additional pollutants are being controlled, attach additional information.			
10) Emission Calculations Attached? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Please attach a copy of all emission calculations.			
11) Additional Information Attached? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <u>Flare is existing and was permitted in 2009. No changes are requested.</u> Please attach a copy of flare manufacturer's data sheet.			

If any of the requested information is not available, please contact the flare manufacturer.

Flares meeting the requirements of G35-A Section 10 and registered under General Permit G35-A are considered federally enforceable.

<u>COMPRESSOR STATION EMISSION SUMMARY SHEET FOR CRITERIA POLLUTANTS</u>										
Compressor Station <u>Maxwell Compressor Station</u>						Registration Number (Agency Use) <u>G35-A</u>				
	Potential Emissions (lbs/hr)					Potential Emissions (tons/yr)				
Source ID No.	NO _x	CO	VOC	SO ₂	PM ₁₀	NO _x	CO	VOC	SO ₂	PM ₁₀
CE-2	2.27	1.70	0.42	<0.01	<0.01	9.95	7.46	1.84	0.01	<0.01
RBV-1	0.03	0.03	<0.01	<0.01	<0.01	0.13	0.11	0.01	<0.01	0.01
RSV-1	--	--	4.52	--	--	--	--	19.79	--	--
EG01	0.03	0.39	0.19	<0.01	0.02	0.01	0.10	0.05	<0.01	<0.01
EG02	0.03	0.39	0.19	<0.01	0.02	0.01	0.10	0.05	<0.01	<0.01
Total	2.36	2.51	5.32	<0.01	0.04	10.1	7.77	21.74	0.01	0.01

Compressor Station <u>Maxwell Compressor Station</u>							Registration Number <small>(Agency Use)</small> <u>G35-A</u>					
	Potential Emissions (lbs/hr)						Potential Emissions (tons/yr)					
Source ID No.	Benzene	Ethyl-benzene	Toluene	Xylenes	n-Hexane	Formaldehyde	Benzene	Ethyl-benzene	Toluene	Xylenes	n-Hexane	Formaldehyde
CE-2	<0.01	<0.01	<0.01	<0.01	<0.01	0.23	<0.01	<0.01	<0.01	<0.01	0.02	1.0
RBV-1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
RSV-1	0.02	0.03	0.05	0.09	0.05	<0.01	0.09	0.14	0.23	0.41	0.24	<0.01
EG01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
EG02	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Total	0.02	0.03	0.05	0.09	0.05	0.29	0.09	0.14	0.23	0.41	0.26	1.02

General Permit Levels Construction, Modification, Relocation, Administrative Update

Class II General Permits – G10-C (Coal Preparation and Handling), G20-B (Hot Mix Asphalt), G30-B (Natural Gas Compressor Stations), G35-A (Natural Gas Compressor Stations with Flares/Glycol Dehydration Units), G40-B (Nonmetallic Minerals Processing), G50-B (Concrete Batch Plant), G60-B (Emergency Generators)

Class I General Permit - G65-B(Emergency Generators)

General Permit	Public Notice	Review Period as per 45CSR13	Application Fee	Criteria	Application Type
Class II General Permit (Construction)	30 days (applicant)	90 days	\$500 + applicable NSPS fees	6 lb/hr and 10 tpy of any regulated air pollutant OR 144 lb/day of any regulated air pollutant, OR 2 lb/hr of any hazardous air pollutant OR 5 tpy of aggregated HAP OR 45CSR27 TAP (10% increase if above BAT triggers or increase to BAT triggers) or subject to applicable standard or rule, but subject to specific eligibility requirements	Registration Application
Class II General Permit (Modification)	30 days (applicant)	90 days	\$500 + applicable NSPS fees	Same as Class II General Permit (Construction) but subject to specific eligibility requirements	Registration Application
Administrative Update (Class I)	None	60 days	None	Decrease in emissions or permanent removal of equipment OR more stringent requirements or change in MRR that is equivalent or superior	Registration Application or Written Request
Administrative Update (Class II)	30 days (applicant)	60 days	\$300 + applicable NSPS fees	No change in emissions or an increase less than Class II Modification levels	Registration Application
Relocation	30 days (applicant)	45 days	\$500 + applicable NSPS fees	No emissions increase or change in facility design or equipment	Registration Application
Class I General Permit	None	45 days	\$250	Same as Class II General Permit (Construction) but subject to specific eligibility requirements	Registration Application

MAYWEL

Engine Emissions Data

For Emissions feedback and questions submit [request form](#)

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	9TG00293
Sales Model	
Build Date	2001-09-24
Interlock Code Progression	No Interlock Code Progression
As Shipped Data	
Engine Arrangement Number	4P8327
Test Spec Number	2T6090
Regulatory Status	Declaration of Incorporation Info
Regulatory Status	Stationary Exempt
Flash File	No Flash File Found
CORR FL Power at RPM	515 HP (384.0 KW) at 1200 RPM
Advertised Power	515HP 1,200RPM
Total Displacement	34.5

This is not an official emission certificate. This is for emission data information only.

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Randy.L.Shaver@dom.com

ENGINE SPEED (rpm):	1200	FUEL:	Nat Gas
COMPRESSION RATIO:	8:1	FUEL SYSTEM:	HPG IMPCO
AFTERCOOLER WATER INLET (°F):	129	FUEL PRESSURE RANGE (psig):	35.0-40.0
JACKET WATER OUTLET (°F):	210	RATED METHANE NUMBER:	80
COOLING SYSTEM:	JW+OC , AC	FUEL LHV (Btu/scf):	905
IGNITION SYSTEM:	EIS	ALTITUDE CAPABILITY (ft):	1001
EXHAUST MANIFOLD:	ASWC	AIR TO TURBO TEMP. (°F):	77
COMBUSTION:	Low Emission	APPLICATION:	Gas Compression
NOx EMISSION LEVEL (g/bhp-hr NOx):	2.0		

RATING		NOTES	%LOAD	100%	75%	50%
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	515	386	257
ENGINE EFFICIENCY	(ISO 3046/1)	(2)	%	33.0	32.3	31.0
ENGINE EFFICIENCY	(NOMINAL)	(2)	%	32.4	31.7	30.4

ENGINE DATA						
FUEL CONSUMPTION	(ISO3046/1)	(3)	Btu/bhp-hr	7700	7872	8211
FUEL CONSUMPTION	(NOMINAL)	(3)	Btu/bhp-hr	7850	8025	8370
AIR FLOW (77°F, 14.7 psia)	(WET)	(4)	scfm	1138	898	582
AIR FLOW	(WET)	(4)	lb/hr	5046	3982	2582
COMPRESSOR OUT PRESSURE			in Hg(abs)	69.9	63.4	45.4
COMPRESSOR OUT TEMPERATURE			°F	311	255	176
AFTERCOOLER AIR OUT TEMPERATURE			°F	138	136	135
INLET MAN. PRESSURE		(5)	in Hg(abs)	65.9	55.1	37.7
INLET MAN. TEMPERATURE	(MEASURED IN PLENUM)	(6)	°F	140	136	156
TIMING		(7)	°BTDC	30.0	30.0	30.0
EXHAUST STACK TEMPERATURE		(8)	°F	804	801	797
EXHAUST GAS FLOW (@stack temp, 14.5 psia)	(WET)	(9)	ft3/min	2904	2281	1481
EXHAUST GAS MASS FLOW	(WET)	(9)	lb/hr	5250	4138	2690

EMISSIONS DATA						
NOx (as NO2)		(10)	g/bhp-hr	2.00	2.30	4.30
CO		(11)	g/bhp-hr	1.50	1.49	1.90
THC (molecular wt. of 15.84)		(11)	g/bhp-hr	2.49	2.49	2.19
NMHC (molecular wt. of 15.84)		(11)	g/bhp-hr	0.37	0.37	0.33
NMNEHC (molecular wt. of 15.84)		(11)	g/bhp-hr	0.25	0.25	0.22
HCHO (Formaldehyde)		(11)	g/bhp-hr	0.27	0.27	0.27
CO2		(11)	g/bhp-hr	510	522	544
EXHAUST OXYGEN		(12)	% DRY	7.7	7.4	6.6
LAMBDA		(12)		1.56	1.61	1.50

ENERGY BALANCE DATA						
LHV INPUT		(13)	Btu/min	67373	51656	35918
HEAT REJECTION TO JACKET WATER		(14)	Btu/min	18001	14229	11193
HEAT REJECTION TO ATMOSPHERE		(15)	Btu/min	2732	2277	1822
HEAT REJECTION TO LUBE OIL		(16)	Btu/min	2685	2122	1669
HEAT REJECTION TO EXHAUST (LHV TO 77°F)		(17)	Btu/min	17624	13769	8909
HEAT REJECTION TO EXHAUST (LHV TO 350°F)		(17)	Btu/min	10674	8329	5394
HEAT REJECTION TO AFTERCOOLER		(18)	Btu/min	3519	1905	429
PUMP POWER		(19)	Btu/min	977	977	977

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.6 in Hg barometric pressure, 500 ft. altitude.) No overload permitted at rating shown. Consult altitude curves for applications above maximum rated altitude and/or temperature.

Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3. Part load data may require engine adjustment.

For notes information consult page three.

FUEL USAGE GUIDE

CAT METHANE NUMBER	25	30	35	40	45	50	55	60	65	70	75	80	83	100
IGNITION TIMING	-	19	20	21	22	23	24	25	26	27	28	29	30	30
DERATION FACTOR	0.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ALTITUDE DERATION FACTORS

AIR TO TURBO	°F	ALTITUDE (FEET ABOVE SEA LEVEL)													
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	
130	130	0.95	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.69	0.67	0.64	0.61	0.59	
120	120	0.96	0.93	0.89	0.86	0.83	0.79	0.76	0.73	0.71	0.68	0.65	0.62	0.60	
110	110	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72	0.69	0.66	0.63	0.61	
100	100	1.00	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67	0.65	0.62	
90	90	1.00	0.98	0.94	0.90	0.87	0.84	0.81	0.77	0.74	0.71	0.69	0.66	0.63	
80	80	1.00	0.99	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67	0.64	
70	70	1.00	1.00	0.98	0.94	0.90	0.87	0.84	0.80	0.77	0.74	0.71	0.68	0.66	
60	60	1.00	1.00	0.99	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67	
50	50	1.00	1.00	1.00	0.98	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71	0.68	

AFTERCOOLER HEAT REJECTION FACTORS

AIR TO TURBO	°F	ALTITUDE (FEET ABOVE SEA LEVEL)													
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	
130	130	1.41	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	
120	120	1.33	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	
110	110	1.24	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	
100	100	1.16	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	
90	90	1.08	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	
80	80	1.00	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	
70	70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
60	60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
50	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE (RPM)

AIR TO TURBO	°F	ALTITUDE (FEET ABOVE SEA LEVEL)													
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	
130	130	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
120	120	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
110	110	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
100	100	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
90	90	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
80	80	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
70	70	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
60	60	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
50	50	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

ACTUAL ENGINE RATING:

To determine the actual rating of the engine at site conditions, one must consider separately, limitations due to fuel characteristics and air system limitations. The Fuel Usage Guide deration establishes fuel limitations. The Altitude/Temperature deration factors and RPC (reference the Caterpillar Methane Program) establish air system limitations. RPC comes into play when the Altitude/Temperature deration is less than 1.0 (100%). Under this condition, add the two factors together. When the site conditions do not require an Altitude/Temperature derate (factor is 1.0), it is assumed the turbocharger has sufficient capability to overcome the low fuel relative power, and RPC is ignored. To determine the actual power available, take the lowest rating between 1) and 2).

- 1) Fuel Usage Guide Deration
- 2) $1 - ((1 - \text{Altitude/Temperature Deration}) + (1 - \text{RPC}))$

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft. altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for air to turbo and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE:

This table shows the minimum allowable engine operating speed for various air inlet temperatures and altitudes.

NOTES:

1. Engine rating is with two engine driven water pumps. Tolerance is $\pm 3\%$ of full load.
2. ISO 3046/1 engine efficiency tolerance is (+)0, (-)5% of full load % efficiency value. Nominal engine efficiency tolerance is $\pm 3.0\%$ of full load % efficiency value.
3. ISO 3046/1 fuel consumption tolerance is (+)5, (-)0% of full load data. Nominal fuel consumption tolerance is $\pm 3.0\%$ of full load data.
4. Undried air. Flow is a nominal value with a tolerance of $\pm 5\%$.
5. Inlet manifold pressure is a nominal value with a tolerance of $\pm 5\%$.
6. Inlet manifold temperature is a nominal value with a tolerance of $\pm 9^\circ\text{F}$.
7. Timing indicated is for use with the minimum fuel methane number specified. Consult the appropriate fuel usage guide for timing at other methane numbers.
8. Exhaust stack temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
9. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of $\pm 6\%$.
10. NOx values are set points and will vary with operating conditions.
11. CO, CO₂, THC, NMHC, NMNEHC, and HCHO values are "not to exceed" levels.
12. Exhaust Oxygen tolerance is ± 0.5 ; Lambda tolerance is ± 0.05 . Lambda and Exhaust Oxygen level are the result of adjusting the engine to operate at the specified NOx level.
13. LHV rate tolerance is $\pm 3.0\%$.
14. Heat rejection to jacket water value displayed includes heat to jacket water alone. Value is based on treated water. Tolerance is $\pm 10\%$ of full load data. Total heat to jacket water circuit = Jacket Heat + Lube Oil Heat
15. Heat rejection to atmosphere based on treated water. Tolerance is $\pm 50\%$ of full load data.
16. Lube oil heat rate based on treated water. Tolerance is $\pm 20\%$ of full load data.
17. Exhaust heat rate based on treated water. Tolerance is $\pm 10\%$ of full load data.
18. A/C Heat (based on treated water) = A/C Heat x A/C Heat Rej. Factor. Tolerance is $\pm 5\%$ of full load data.
19. Pump power includes engine driven jacket water and aftercooler water pumps. Engine brake power includes effects of pump power.

ENGINE POWER (bhp):	515	COOLING SYSTEM:	JW+OC , AC
ENGINE SPEED (rpm):	1200	AFTERCOOLER WATER INLET (°F):	130
EXHAUST MANIFOLD:	ASWC	JACKET WATER OUTLET (°F):	210

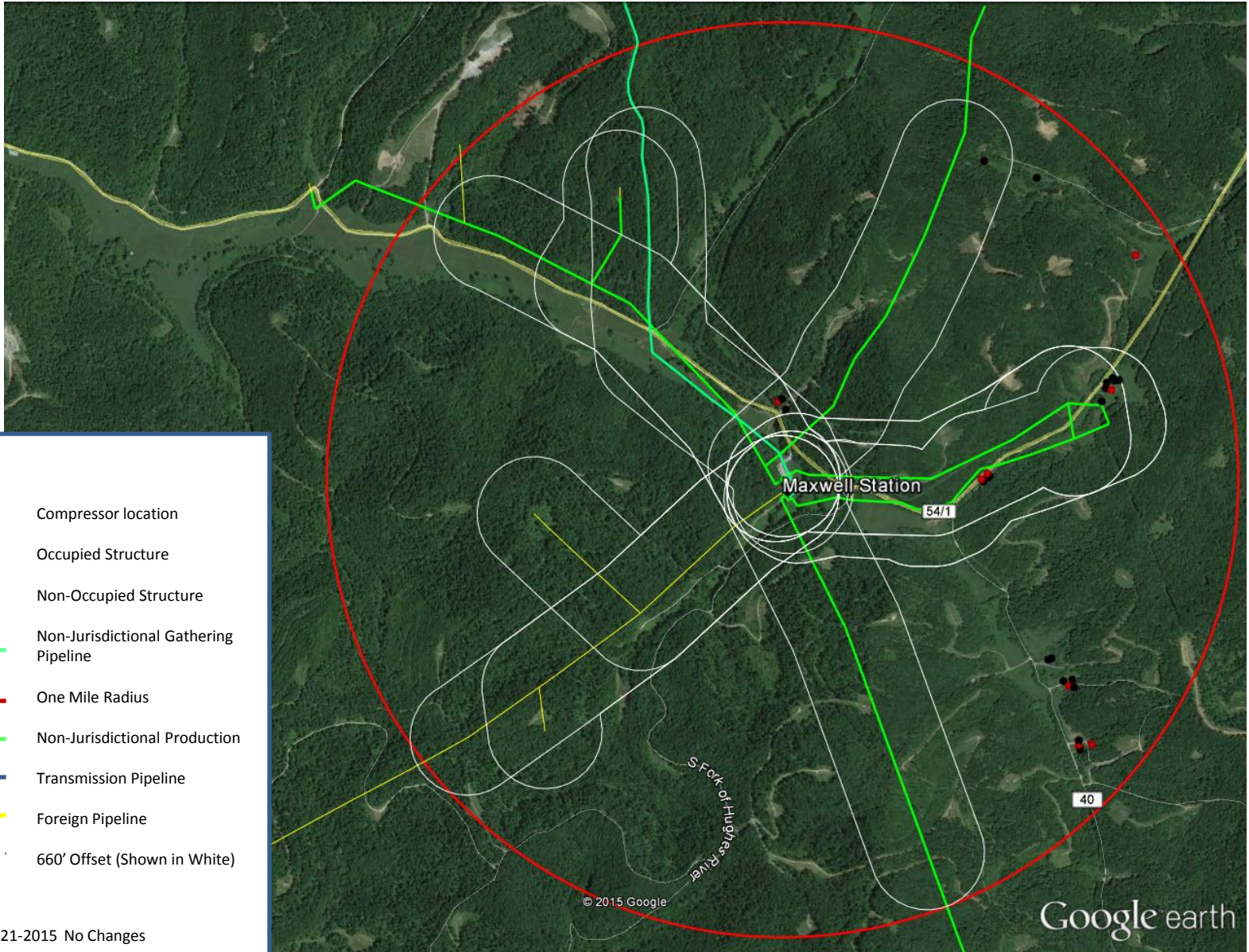
Free Field Mechanical and Exhaust Noise

SOUND PRESSURE LEVEL (dB)			Octave Band Center Frequency (OBCF)								
100% Load Data			(dBA)	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Mechanical Sound	Distance from the Engine (ft.)	3.3	94.3	93.5	90.1	84.3	85.3	88	89.6	86.4	78
		23.0	84.3	83.5	80.1	74.3	75.3	78	79.6	76.4	68
		49.2	78.3	77.5	74.1	68.3	69.3	72	73.6	70.4	62
Exhaust Sound	Distance from the Engine (ft.)	4.9	109.6	97.8	101.6	103.7	100.2	101	103.1	104.9	98.3
		23.0	96.3	87.5	89.8	91.2	87.6	90	89.8	90.2	83.2
		49.2	89.6	80.9	83.2	84.6	81	83.4	83.2	83.6	76.5

SOUND DATA

Data determined by methods similar to ISO Standard DIS-8528-10. Accuracy Grade 3.

Maxwell Station



Legend:

- Compressor location
- Occupied Structure
- Non-Occupied Structure
- Non-Jurisdictional Gathering Pipeline
- One Mile Radius
- Non-Jurisdictional Production
- Transmission Pipeline
- Foreign Pipeline
- - - 660' Offset (Shown in White)

Revised 1-21-2015 No Changes

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Google earth

Attachment I

Emissions Calculations

Compressor Engine(CE-2) Potential Emissions

Dominion Transmission, Inc.

Maxwell Compressor Station

Input Data:	Caterpillar G3508 LE (Emission ID #: CE-2)		
Design Class:	4-stroke lean burn		
Engine Power:	515	bhp	(Manufacturer Specs)
Fuel Consumption:	8,370	Btu/hp-hr	(Manufacturer Specs - Worst Case)
Fuel Input:	4.31	MMBtu/hr	
Maximum Hours of Operation:	8,760	hrs/yr	
Fuel Throughput:	4,311	cf/hr	
	37.8	MMcf/yr	
Heating Value of Natural Gas:	1,000	Btu/cf	

Emission Calculations

Pollutant	Emission Factor		Emissions (8760 hrs/yr)		
			(lb/hr)	(lbs/day)	(tons/yr)
Criteria Pollutants					
PM (filterable)	7.71E-05	lb/MMBtu	3.32E-04	0.01	1.46E-03
PM-10 (filterable)	7.71E-05	lb/MMBtu	3.32E-04	0.01	1.46E-03
PM-2.5 (filterable)	7.71E-05	lb/MMBtu	3.32E-04	0.01	1.46E-03
PM (condensibles)	9.91E-03	lb/MMBtu	0.04	1.03	0.19
SO2	5.88E-04	lb/MMBtu	2.53E-03	0.06	1.11E-02
CO	1.50	g/bhp-hr	1.70	40.87	7.46
NO _x	2.0	g/bhp-hr	2.27	54.50	9.95
VOC	0.37	g/bhp-hr	0.42	10.08	1.84
Greenhouse Gases					
CO ₂	117.0	lb/MMBtu	504.24	--	2208.56
CH ₄	2.20E-03	lb/MMBtu	0.01	--	0.04
N ₂ O	2.20E-04	lb/MMBtu	0.00	--	0.00
CO ₂ e	117.1	lb/MMBtu	504.76	--	2210.84
Hazardous Air Pollutants					
1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	1.72E-04	--	7.55E-04
1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	1.37E-04	--	6.00E-04
1,1-Dichloroethane	2.36E-05	lb/MMBtu	1.02E-04	--	4.46E-04
1,2-Dichloroethane	2.36E-05	lb/MMBtu	1.02E-04	--	4.46E-04
1,2-Dichloropropane	2.69E-05	lb/MMBtu	1.16E-04	--	5.08E-04
1,3-Butadiene	2.69E-04	lb/MMBtu	1.16E-03	--	5.08E-03
1,3-Dichloropropene	2.64E-05	lb/MMBtu	1.14E-04	--	4.98E-04
Acrolein	5.14E-03	lb/MMBtu	2.22E-02	--	9.70E-02
Acetaldehyde	8.36E-03	lb/MMBtu	3.60E-02	--	1.58E-01
Benzene	4.40E-04	lb/MMBtu	1.90E-03	--	8.31E-03
Butr/isobutyraldehyde	1.01E-04	lb/MMBtu	4.35E-04	--	1.91E-03
Carbon Tetrachloride	3.67E-05	lb/MMBtu	1.58E-04	--	6.93E-04
Chlorobenzene	3.04E-05	lb/MMBtu	1.31E-04	--	5.74E-04
Chloroform	2.85E-05	lb/MMBtu	1.23E-04	--	5.38E-04
Ethane	1.05E-01	lb/MMBtu	4.53E-01	--	1.98E+00
Ethylbenzene	3.97E-05	lb/MMBtu	1.71E-04	--	7.50E-04
Ethylene Dibromide	4.43E-05	lb/MMBtu	1.91E-04	--	8.36E-04
Formaldehyde	5.28E-02	lb/MMBtu	2.28E-01	--	9.97E-01
Methanol	2.50E-03	lb/MMBtu	1.08E-02	--	4.72E-02
Methylene Chloride	2.00E-05	lb/MMBtu	8.62E-05	--	3.78E-04
Naphthalene (POM)	7.44E-05	lb/MMBtu	3.21E-04	--	1.40E-03
n-Hexane	1.11E-03	lb/MMBtu	4.78E-03	--	2.10E-02
PAH	2.69E-05	lb/MMBtu	1.16E-04	--	5.08E-04
Styrene	2.36E-05	lb/MMBtu	1.02E-04	--	4.46E-04
Toluene	4.08E-04	lb/MMBtu	1.76E-03	--	7.70E-03
Vinyl Chloride	1.49E-05	lb/MMBtu	6.42E-05	--	2.81E-04
Xylene	1.84E-04	lb/MMBtu	7.93E-04	--	3.47E-03
TOTAL HAP:			0.76		3.34

(1) Lb/MMBtu emission factors from AP-42, Section 3.2, Natural Gas-Fired Reciprocating Engines, Table 3.2-2, 7/00

(2) G/bhp-hr emission factors from manufacturer specification sheet.

(3) Lb/MMBtu numbers based on 40 CFR Part 98 Tables C-1 and C-2 for natural gas

For example: $CO_2 = (53.06 \text{ kg } CO_2/MMBtu) / (0.453592 \text{ kg/lb}) = 117.0 \text{ lb/MMBtu}$

(4) Global Warming Potentials = 25 for CH₄ and 298 for N₂O (per 40 CFR Part 98 Table A-1 to Subpart A)

For example: $CO_2e = (117.0 \text{ lb/MMBtu}) + (0.0022 \text{ lb/MMBtu} * 25) + (0.00022 \text{ lb/MMBtu} * 298) = 117.1 \text{ lb/MMBtu}$

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Maxwell - Dehy 2015 PTE
 File Name: Q:\Facilities\DTI\West Virginia\Maxwell Station\Air\New Dehy Project -
 2015\Maxwell - 2015 PTE Glycalc.ddf
 Date: April 08, 2015

DESCRIPTION:

Description:

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 110.00 deg. F
 Pressure: 365.00 psig
 Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1120
Nitrogen	2.1860
Methane	76.3270
Ethane	12.3260
Propane	5.4800
Isobutane	0.7850
n-Butane	1.4950
Isopentane	0.4330
n-Pentane	0.3540
n-Hexane	0.0720
Cyclohexane	0.0160
Other Hexanes	0.1580
Heptanes	0.1120
Benzene	0.0030
Toluene	0.0050
Ethylbenzene	0.0020
Xylenes	0.0050
C8+ Heavies	0.1290

DRY GAS:

Flow Rate: 4.3 MMSCF/day
 Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
 Water Content: 0.1 wt% H2O
 Flow Rate: 3.0 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control: Recycle/recompression
Temperature: 160.0 deg. F
Pressure: 125.0 psig

STRIPPING GAS:

Source of Gas: Dry Gas
Gas Flow Rate: 65.000 scfm

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Combustion Device
Destruction Efficiency: 95.0 %
Excess Oxygen: 1.0 %
Ambient Air Temperature: 68.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Maxwell - Dehy 2015 PTE

File Name: Q:\Facilities\DTI\West Virginia\Maxwell Station\Air\New Dehy Project - 2015\Maxwell - 2015 PTE Glycalc.ddf

Date: April 08, 2015

DESCRIPTION:

Description:

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	6.3231	151.754	27.6952
Ethane	1.9637	47.130	8.6012
Propane	1.3264	31.833	5.8096
Isobutane	0.2604	6.249	1.1404
n-Butane	0.5148	12.355	2.2549
Isopentane	0.1883	4.520	0.8249
n-Pentane	0.1611	3.866	0.7055
n-Hexane	0.0455	1.093	0.1995
Cyclohexane	0.0211	0.506	0.0924
Other Hexanes	0.0922	2.212	0.4037
Heptanes	0.1102	2.644	0.4826
Benzene	0.0162	0.390	0.0711
Toluene	0.0431	1.034	0.1887
Ethylbenzene	0.0263	0.631	0.1152
Xylenes	0.0773	1.855	0.3386
C8+ Heavies	0.8829	21.189	3.8670

Total Emissions	12.0526	289.262	52.7904
Total Hydrocarbon Emissions	12.0526	289.262	52.7904
Total VOC Emissions	3.7657	90.378	16.4940
Total HAP Emissions	0.2085	5.003	0.9130
Total BTEX Emissions	0.1629	3.910	0.7136

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	126.4620	3035.088	553.9035
Ethane	39.2750	942.600	172.0245
Propane	26.5277	636.665	116.1913
Isobutane	5.2075	124.979	22.8087
n-Butane	10.2962	247.108	45.0973
Isopentane	3.7667	90.401	16.4982
n-Pentane	3.2213	77.311	14.1093
n-Hexane	0.9108	21.860	3.9895
Cyclohexane	0.4217	10.121	1.8470
Other Hexanes	1.8436	44.246	8.0748
Heptanes	2.2035	52.883	9.6512

Benzene	0.3247	7.792	1.4220
Toluene	0.8617	20.681	3.7742
Ethylbenzene	0.5260	12.624	2.3039
Xylenes	1.5459	37.103	6.7712
C8+ Heavies	17.6577	423.785	77.3408

Total Emissions	241.0519	5785.246	1055.8074

Total Hydrocarbon Emissions	241.0519	5785.246	1055.8074
Total VOC Emissions	75.3149	1807.558	329.8794
Total HAP Emissions	4.1691	100.060	18.2609
Total BTEX Emissions	3.2583	78.199	14.2714

FLASH GAS EMISSIONS

Note: Flash Gas Emissions are zero with the Recycle/recompression control option.

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.4155	33.972	6.1998
Ethane	0.9330	22.393	4.0868
Propane	0.7256	17.415	3.1783
Isobutane	0.1591	3.818	0.6968
n-Butane	0.3322	7.972	1.4550
Isopentane	0.1236	2.966	0.5412
n-Pentane	0.1090	2.615	0.4773
n-Hexane	0.0299	0.718	0.1311
Cyclohexane	0.0075	0.180	0.0329
Other Hexanes	0.0621	1.490	0.2719
Heptanes	0.0605	1.451	0.2649
Benzene	0.0014	0.035	0.0063
Toluene	0.0027	0.065	0.0118
Ethylbenzene	0.0010	0.025	0.0045
Xylenes	0.0022	0.053	0.0097
C8+ Heavies	0.1965	4.717	0.8609

Total Emissions	4.1619	99.885	18.2290

Total Hydrocarbon Emissions	4.1619	99.885	18.2290
Total VOC Emissions	1.8134	43.520	7.9425
Total HAP Emissions	0.0373	0.896	0.1635
Total BTEX Emissions	0.0074	0.177	0.0324

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 68.00 deg. F
 Excess Oxygen: 1.00 %
 Combustion Efficiency: 95.00 %
 Supplemental Fuel Requirement: 1.04e+000 MM BTU/hr

Component	Emitted	Destroyed
Methane	5.00%	95.00%
Ethane	5.00%	95.00%
Propane	5.00%	95.00%
Isobutane	5.00%	95.00%
n-Butane	5.00%	95.00%
Isopentane	5.00%	95.00%
n-Pentane	5.00%	95.00%
n-Hexane	5.00%	95.00%
Cyclohexane	5.00%	95.00%
Other Hexanes	5.00%	95.00%
Heptanes	5.00%	95.00%
Benzene	5.00%	95.00%
Toluene	5.00%	95.00%
Ethylbenzene	5.00%	95.00%
Xylenes	5.00%	95.00%
C8+ Heavies	5.00%	95.00%

 ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 3.49 lbs. H2O/MMSCF
 Temperature: 110.0 deg. F
 Pressure: 365.0 psig
 Dry Gas Flow Rate: 4.3000 MMSCF/day
 Glycol Losses with Dry Gas: 0.0505 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 175.14 lbs. H2O/MMSCF
 Calculated Lean Glycol Recirc. Ratio: 5.85 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	1.98%	98.02%
Carbon Dioxide	99.58%	0.42%
Nitrogen	99.96%	0.04%
Methane	99.97%	0.03%
Ethane	99.88%	0.12%
Propane	99.79%	0.21%
Isobutane	99.68%	0.32%
n-Butane	99.58%	0.42%
Isopentane	99.53%	0.47%
n-Pentane	99.40%	0.60%
n-Hexane	98.95%	1.05%
Cyclohexane	95.33%	4.67%
Other Hexanes	99.20%	0.80%
Heptanes	97.86%	2.14%
Benzene	72.13%	27.87%
Toluene	61.65%	38.35%
Ethylbenzene	48.54%	51.46%
Xylenes	39.15%	60.85%
C8+ Heavies	84.65%	15.35%

FLASH TANK

Flash Control: Recycle/recompression
 Flash Temperature: 160.0 deg. F
 Flash Pressure: 125.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.99%	0.01%
Carbon Dioxide	77.91%	22.09%
Nitrogen	27.57%	72.43%
Methane	28.13%	71.87%
Ethane	56.06%	43.94%
Propane	70.31%	29.69%
Isobutane	76.87%	23.13%
n-Butane	80.76%	19.24%
Isopentane	82.21%	17.79%
n-Pentane	84.91%	15.09%
n-Hexane	90.37%	9.63%
Cyclohexane	97.55%	2.45%
Other Hexanes	88.09%	11.91%
Heptanes	94.69%	5.31%
Benzene	99.56%	0.44%
Toluene	99.70%	0.30%
Ethylbenzene	99.82%	0.18%
Xylenes	99.87%	0.13%
C8+ Heavies	98.92%	1.08%

REGENERATOR

Regenerator Stripping Gas:
 Dry Product Gas Stripping Gas Flow Rate: 65.0000 scfm

Component	Remaining in Glycol	Distilled Overhead
Water	5.19%	94.81%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.61%	99.39%
n-Pentane	0.59%	99.41%
n-Hexane	0.55%	99.45%
Cyclohexane	3.28%	96.72%
Other Hexanes	1.13%	98.87%
Heptanes	0.53%	99.47%
Benzene	5.02%	94.98%
Toluene	7.92%	92.08%
Ethylbenzene	10.42%	89.58%
Xylenes	12.92%	87.08%
C8+ Heavies	12.14%	87.86%

STREAM REPORTS:

WET GAS STREAM

Temperature: 110.00 deg. F
 Pressure: 379.70 psia
 Flow Rate: 1.80e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.69e-001	3.15e+001
Carbon Dioxide	1.12e-001	2.33e+001
Nitrogen	2.18e+000	2.89e+002
Methane	7.60e+001	5.79e+003
Ethane	1.23e+001	1.75e+003
Propane	5.46e+000	1.14e+003
Isobutane	7.82e-001	2.16e+002
n-Butane	1.49e+000	4.11e+002
Isopentane	4.31e-001	1.48e+002
n-Pentane	3.53e-001	1.21e+002
n-Hexane	7.17e-002	2.93e+001
Cyclohexane	1.59e-002	6.36e+000
Other Hexanes	1.57e-001	6.44e+001
Heptanes	1.12e-001	5.30e+001
Benzene	2.99e-003	1.11e+000
Toluene	4.98e-003	2.18e+000
Ethylbenzene	1.99e-003	1.00e+000
Xylenes	4.98e-003	2.51e+000
C8+ Heavies	1.29e-001	1.04e+002
Total Components	100.00	1.02e+004

DRY GAS STREAM

Temperature: 110.00 deg. F
 Pressure: 379.70 psia
 Flow Rate: 1.79e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	7.36e-003	6.26e-001
Carbon Dioxide	1.12e-001	2.32e+001
Nitrogen	2.19e+000	2.89e+002
Methane	7.64e+001	5.78e+003
Ethane	1.23e+001	1.75e+003
Propane	5.47e+000	1.14e+003
Isobutane	7.83e-001	2.15e+002
n-Butane	1.49e+000	4.09e+002
Isopentane	4.31e-001	1.47e+002
n-Pentane	3.52e-001	1.20e+002
n-Hexane	7.13e-002	2.90e+001
Cyclohexane	1.53e-002	6.07e+000
Other Hexanes	1.57e-001	6.38e+001
Heptanes	1.10e-001	5.19e+001
Benzene	2.17e-003	7.99e-001

Toluene	3.09e-003	1.34e+000
Ethylbenzene	9.72e-004	4.87e-001
Xylenes	1.96e-003	9.82e-001
C8+ Heavies	1.09e-001	8.79e+001

Total Components	100.00	1.01e+004
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LEAN GLYCOL STREAM

Temperature: 110.00 deg. F
Flow Rate: 3.00e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.97e+001	1.69e+003
Water	1.00e-001	1.69e+000
Carbon Dioxide	5.78e-013	9.77e-012
Nitrogen	6.03e-013	1.02e-011
Methane	3.91e-018	6.62e-017
Ethane	5.92e-008	1.00e-006
Propane	5.88e-009	9.95e-008
Isobutane	1.22e-009	2.06e-008
n-Butane	2.53e-009	4.28e-008
Isopentane	2.05e-004	3.47e-003
n-Pentane	2.13e-004	3.61e-003
n-Hexane	9.18e-005	1.55e-003
Cyclohexane	5.80e-004	9.82e-003
Other Hexanes	3.08e-004	5.21e-003
Heptanes	3.37e-004	5.70e-003
Benzene	9.60e-004	1.62e-002
Toluene	4.23e-003	7.16e-002
Ethylbenzene	3.54e-003	6.00e-002
Xylenes	1.34e-002	2.26e-001
C8+ Heavies	1.29e-001	2.18e+000
Total Components	100.00	1.69e+003

RICH GLYCOL STREAM

Temperature: 110.00 deg. F
Pressure: 379.70 psia
Flow Rate: 3.13e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.62e+001	1.69e+003
Water	1.86e+000	3.26e+001
Carbon Dioxide	5.57e-003	9.78e-002
Nitrogen	5.83e-003	1.02e-001
Methane	1.12e-001	1.97e+000
Ethane	1.21e-001	2.12e+000
Propane	1.39e-001	2.44e+000
Isobutane	3.92e-002	6.88e-001
n-Butane	9.85e-002	1.73e+000
Isopentane	3.96e-002	6.95e-001
n-Pentane	4.12e-002	7.22e-001
n-Hexane	1.77e-002	3.11e-001

Cyclohexane	1.75e-002	3.07e-001
Other Hexanes	2.97e-002	5.21e-001
Heptanes	6.50e-002	1.14e+000
Benzene	1.85e-002	3.25e-001
Toluene	5.17e-002	9.07e-001
Ethylbenzene	3.29e-002	5.76e-001
Xylenes	1.00e-001	1.75e+000
C8+ Heavies	1.03e+000	1.81e+001

Total Components	100.00	1.75e+003
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FLASH TANK OFF GAS STREAM

Temperature: 160.00 deg. F
 Pressure: 139.70 psia
 Flow Rate: 5.84e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.63e-001	4.52e-003
Carbon Dioxide	3.19e-001	2.16e-002
Nitrogen	1.72e+000	7.41e-002
Methane	5.74e+001	1.42e+000
Ethane	2.02e+001	9.33e-001
Propane	1.07e+001	7.26e-001
Isobutane	1.78e+000	1.59e-001
n-Butane	3.72e+000	3.32e-001
Isopentane	1.11e+000	1.24e-001
n-Pentane	9.82e-001	1.09e-001
n-Hexane	2.26e-001	2.99e-002
Cyclohexane	5.81e-002	7.51e-003
Other Hexanes	4.68e-001	6.21e-002
Heptanes	3.92e-001	6.05e-002
Benzene	1.20e-002	1.44e-003
Toluene	1.90e-002	2.70e-003
Ethylbenzene	6.35e-003	1.04e-003
Xylenes	1.36e-002	2.22e-003
C8+ Heavies	7.50e-001	1.97e-001
Total Components	100.00	4.26e+000

FLASH TANK GLYCOL STREAM

Temperature: 160.00 deg. F
 Flow Rate: 3.12e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.64e+001	1.69e+003
Water	1.86e+000	3.26e+001
Carbon Dioxide	4.35e-003	7.62e-002
Nitrogen	1.61e-003	2.82e-002
Methane	3.17e-002	5.54e-001
Ethane	6.81e-002	1.19e+000
Propane	9.82e-002	1.72e+000
Isobutane	3.02e-002	5.29e-001
n-Butane	7.97e-002	1.39e+000
Isopentane	3.27e-002	5.71e-001

n-Pentane	3.50e-002	6.13e-001
n-Hexane	1.60e-002	2.81e-001
Cyclohexane	1.71e-002	2.99e-001
Other Hexanes	2.62e-002	4.59e-001
Heptanes	6.17e-002	1.08e+000

Benzene	1.85e-002	3.24e-001
Toluene	5.17e-002	9.04e-001
Ethylbenzene	3.29e-002	5.75e-001
Xylenes	1.00e-001	1.75e+000
C8+ Heavies	1.02e+000	1.79e+001

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Total Components	100.00	1.75e+003

FLASH GAS EMISSIONS

Control Method: Recycle/recompression
Control Efficiency: 100.00

Note: Flash Gas Emissions are zero with the
Recycle/recompression control option.

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 4.67e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
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Water	1.39e+001	3.09e+001
Carbon Dioxide	1.07e-001	5.81e-001
Nitrogen	1.83e+000	6.33e+000
Methane	6.41e+001	1.26e+002
Ethane	1.06e+001	3.93e+001
Propane	4.89e+000	2.65e+001
Isobutane	7.28e-001	5.21e+000
n-Butane	1.44e+000	1.03e+001
Isopentane	4.24e-001	3.77e+000
n-Pentane	3.63e-001	3.22e+000
n-Hexane	8.59e-002	9.11e-001
Cyclohexane	4.07e-002	4.22e-001
Other Hexanes	1.74e-001	1.84e+000
Heptanes	1.79e-001	2.20e+000
Benzene	3.38e-002	3.25e-001
Toluene	7.60e-002	8.62e-001
Ethylbenzene	4.03e-002	5.26e-001
Xylenes	1.18e-001	1.55e+000
C8+ Heavies	8.42e-001	1.77e+001
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Total Components	100.00	2.79e+002

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.96e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
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Methane 7.62e+001 6.32e+000  
Ethane 1.26e+001 1.96e+000  
Propane 5.81e+000 1.33e+000  
Isobutane 8.66e-001 2.60e-001  
n-Butane 1.71e+000 5.15e-001  
  
Isopentane 5.04e-001 1.88e-001  
n-Pentane 4.31e-001 1.61e-001  
n-Hexane 1.02e-001 4.55e-002  
Cyclohexane 4.84e-002 2.11e-002  
Other Hexanes 2.07e-001 9.22e-002  
  
Heptanes 2.12e-001 1.10e-001  
Benzene 4.02e-002 1.62e-002  
Toluene 9.03e-002 4.31e-002  
Ethylbenzene 4.79e-002 2.63e-002  
Xylenes 1.41e-001 7.73e-002  
  
C8+ Heavies 1.00e+000 8.83e-001  
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Total Components 100.00 1.21e+001
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Attachment J

Class I Legal Advertisement

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that Dominion Transmission, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update Permit for the Maxwell Compressor Station located on County Route 19/11, Porto Rico, in Doddridge County, West Virginia. The latitude and longitude coordinates are:

Latitude: 39.181782
Longitude: -80.7622718

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be:

PM ₁₀	-0.18	tons/yr
SO ₂	-0.03	tons/yr
CO	-57.06	tons/yr
NOx	-28.38	tons/yr
VOC	+14.59	tons/yr
Formaldehyde	+0.64	tons/yr

Startup of operation is planned to begin on or about the June 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: Dominion Transmission, Inc.
Brian Sheppard
VP of Pipeline Operations
445 West Main Street
Clarksburg, WV 26301

Attachment L

General Permit Registration Application Fee