ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Supplemental Filing
March 24, 2017

APPENDIX A

Marts Compressor Station Class II Administrative Update Application

Dominion Resources Services, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060

Web Address: www.dom.com

March 16, 2017

BY: OVERNIGHT MAIL

Mr. Joseph Kessler
Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, West Virginia, 25304

RE: Atlantic Coast Pipeline, L.L.C. (ACP)
Marts Compressor Station Permit No. R13-3271
Class II Administrative Update Application

Dear Mr. Kessler:

Enclosed is an administrative update application pursuant of WV 45 CSR 13 for changes to the Marts Compressor Station in Lewis County, West Virginia. ACP requests the following changes with this submittal:

- Removal of the Caterpillar Emergency Generator (EG-1) rated at 2,098 hp;
- Installation of two Caterpillar Emergency Generators (EG-1 and EG-2) each rated at 1,114 hp;
- Modification of the Pipeline Liquids Tank (TK-1) from 2,500 gallons to 3,000 gallon capacity;
- Modification of the Aqueous Ammonia Tank (TK-3) from 8,000 gallons to 13,000 gallons; and

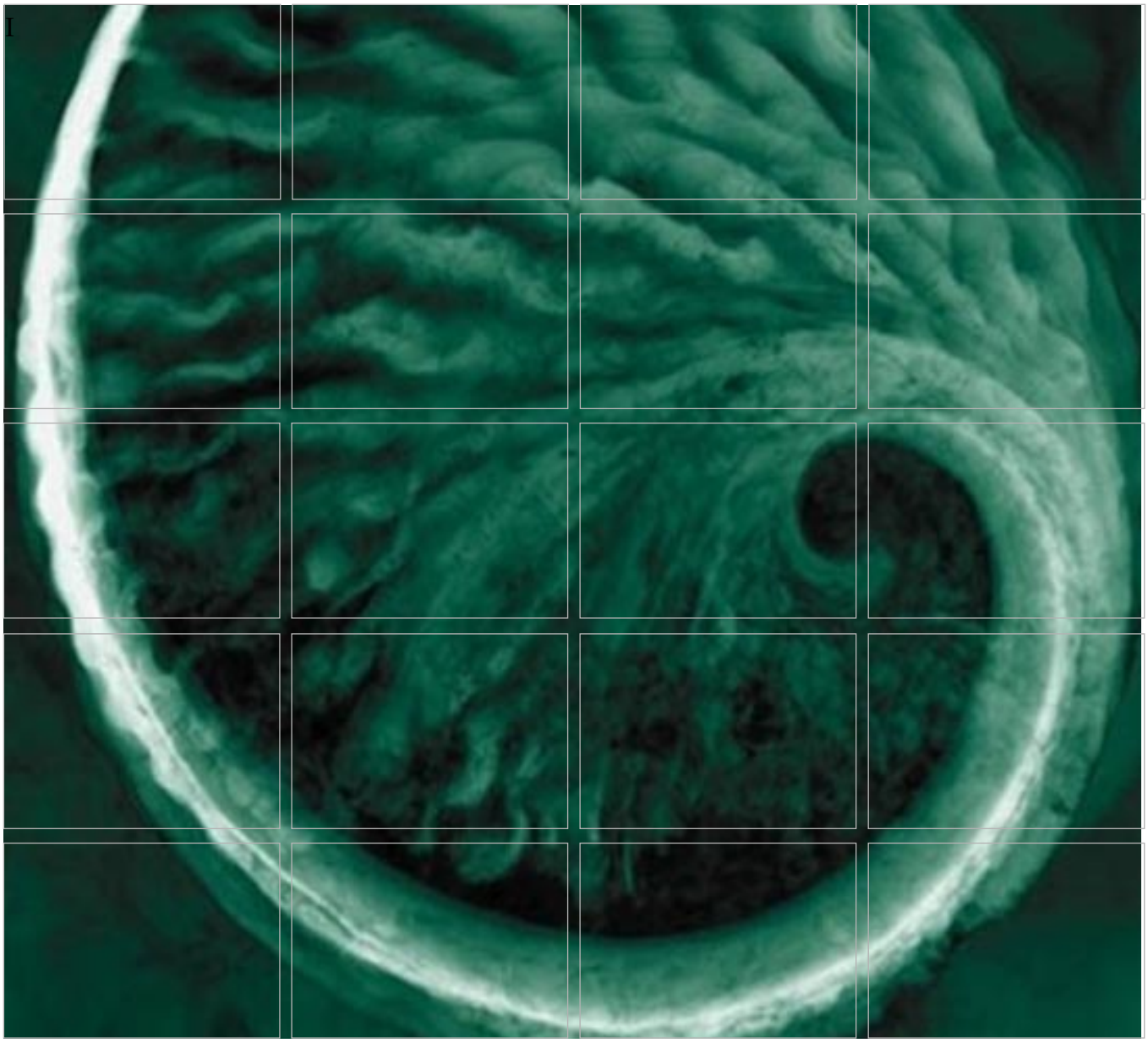
A legal advertisement will be published in the next few days and proof of publication will be forwarded as soon as it is received.

Additionally, enclosed is a check in the amount of $1,300.

Should you have any questions or need additional information, please feel free to contact Laurence Labrie at (804) 273-3075 or via email at laurence.a.labrie@dom.com.

Sincerely,

Robert Bisha, Technical Advisor
Atlantic Coast Pipeline
Dominion Environmental Services



Prepared For:

Atlantic Coast Pipeline℠

Atlantic Coast Pipeline, LLC

Atlantic Coast Pipeline Project
Class II Administrative Update Permit Application
Marts Compressor Station
Lewis County, WV

March 2017

Environmental Resources Management
75 Valley Stream Parkway, Suite 200
Malvern, PA 19355

www.erm.com

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1.0 INTRODUCTION

1.1 BACKGROUND

Atlantic Coast Pipeline, LLC (ACP, LLC) proposes to construct and operate the Atlantic Coast Pipeline (ACP), an approximately 600-mile-long interstate natural gas transmission pipeline system designed to meet growing energy needs in Virginia and North Carolina. The proposed project has the capacity to deliver 1.5 billion standard cubic feet of natural gas per day (bscf/d) from Pennsylvania and West Virginia to power generation facilities and other end-users.

In support of the ACP, Dominion Transmission Inc. (DTI), a subsidiary of Dominion, received the authority to construct the Marts Compressor Station (ACP-1) in Lewis County, West Virginia through the issuance of R13-3271 on July 21, 2016. The Marts Compressor Station will provide compression to support the transmission of natural gas. Two adjacent metering and regulation (M&R) stations will also be operated by DTI and have been included in this application. Kincheloe is an M&R station associated with ACP and the CNX M&R Station is part of an additional DTI pipeline which is part of a separate, but related project, the Supply Header Project.

1.2 APPLICATION OVERVIEW

ACP, LLC submits this application for an administrative update to the West Virginia Department of Environmental Protections (WVDEP), Division of Air Quality (DAQ) to update the existing permit, R13-3271. This permit application narrative is provided to add clarification and/or further detail to the permit application forms provided by the DAQ.

This section (Section 1) contains introductory information. Section 2 presents a description of the Marts Compressor Station and its associated equipment. The estimated emissions of regulated pollutants from the equipment and operating scenarios are presented in Section 3. Section 4 provides a review of federal regulatory requirements applicable to project sources and Section 5 addresses an evaluation of the applicability of State regulatory requirements. Section 6 provides ACP, LLC's proposed compliance demonstration methods.

The R13 application also contains WVDAQ Permit Application Forms as Appendix A.

2.0 FACILITY AND PROJECT DESCRIPTION

2.1 MARTS COMPRESSOR STATION

The Marts Compressor Station will operate in Lewis County, West Virginia to provide compression to support the transport of natural gas.

ACP, LLC currently has the authority to construct and operate the following equipment:

- One (1) Solar Titan 130 Combustion Turbine (CT-1) rated at 20,050 horsepower (hp) (ISO);
- One (1) Solar Mars 100 Combustion Turbine (CT-2) rated at 15,900 hp (ISO);
- One (1) Solar Taurus 70 Combustion Turbine (CT-3) rated at 11,107 hp (ISO);
- One (1) Solar Taurus 60 Combustion Turbine (CT-4) rated at 7,684 hp (ISO);
- One (1) Caterpillar Emergency Generator (EG-1) rated at 2,098 hp;
- One (1) Pipeline Liquids Tank (TK-1) with a capacity of 2,500 gallons;
- One (1) Hydrocarbon Waste Tank (TK-2) with a capacity of 2,000 gallons;
- One (1) Aqueous Ammonia Storage Tank (TK-3) with a capacity of 8,000 gallons; and
- Various operational natural gas releases associated with station components (FUG-01), piping fugitive emissions (FUG-02), and loading rack emissions (LR-01) related to the equipment proposed at the Marts Compressor Station.

ACP, LLC requests the following changes with this submittal:

- Removal of One (1) Caterpillar Emergency Generator (EG-1) rated at 2,098 hp;
- Installation of Two (2) Caterpillar Emergency Generators (EG-1 and EG-2) each rated at 1,114 hp;
- Modification of the Pipeline Liquids Tank (TK-1) from 2,500 gallons to 3,000 gallon capacity;
- Modification of the Aqueous Ammonia Tank (TK-3) from 8,000 gallons to 13,000 gallons; and
- An update to piping fugitive emissions (FUG-02) to update a typographical error in emission factors.

A map displaying the location of the Marts Compressor Station is provided in Figure 2.1 of this application.

FIGURE 2.1 MARTS COMPRESSOR STATION LOCATION MAP

2.2 *AGGREGATION DETERMINATION*

The Marts Compressor Station will be operated by DTI. Stationary sources of air pollutants may require aggregation of total emission levels if these sources share the same industrial grouping, are operating under common control, and are classified as contiguous or adjacent properties. DTI will operate the Marts Compressor Station with the same industrial grouping as adjacent M&R stations. This application includes emission sources associated with the compressor station and the Kincheloe and CNX M&R stations. Other than the interstate pipeline, which is specifically exempt from the requirement to aggregate as stated in the preamble to the 1980 PSD regulations, there are no other facilities that would be considered adjacent to the Marts Compressor Station and thus no other sources must be aggregated with the Marts Compressor Station.

3.0 PROJECT EMISSIONS INFORMATION

As discussed in Section 2.1 of this application, ACP, LLC seeks the authority to construct and operate new emission sources. This section provides a description of the basis for the estimation of emissions from the sources impacted by this application.

3.1 EMERGENCY GENERATOR

Emissions for the natural gas fired emergency generators assume a maximum 100 hours of non-emergency operation per year and are calculated using vendor specifications and EPA's AP-42 emission factors. A summary of the emissions associated with each of the emergency generators are provided in Attachment N.

3.2 STORAGE TANKS

The Marts Compressor Station will operate three aboveground storage tanks (ASTs). TK-1 (Pipeline Liquids Tank) will have a capacity of 3,000 gallons and will receive and store pipeline liquids captured by the station's separators and filter-separators. The emissions associated with the operation of this accumulator storage tank are estimated using E&P Tanks to ensure capture of any flash emissions (which the EPA TANKS program cannot estimate). ACP, LLC has estimated that this storage tank will complete five turnovers per year. ACP, LLC requests an update to the sizing of TK-1, previously stated as 2,500 gallons, but would note that there were no changes to total fluid throughput.

TK-2 (Hydrocarbon Waste Tank) will have a capacity of 2,000 gallons and will receive and store pipeline liquids captured by the station's separators and filter-separators. The emissions associated with the operation of this hydrocarbon waste tank were calculated using EPA's TANKS program. ACP, LLC has estimated that this storage tank will complete five (5) turnovers per year. TK-2 is not being modified with this submittal.

The potential VOC emissions associated with the TK-1 storage tank is 0.37 tons per year (tpy) and 0.08 pounds per hour (lb/hr).

TK-3 (Aqueous Ammonia Storage Tank) will have a capacity of 13,000 gallons and will be used to supply aqueous ammonia to SCRs. ACP, LLC requests an update to the sizing of TK-3, previously stated as 8,000 gallons, but would note that there were no changes to total fluid throughput.

3.3 PROJECT EMISSIONS

The potential emissions associated with the proposed administrative update at the Marts Compressor Station are summarized in Table 3.1 in tons per year. The total potential emissions from the Marts Compressor Station are summarized in Table 3.2 in tons per year. Detailed emission calculations are provided in Appendix A (see Attachment N) of this document.

The proposed changes result in a small increase in emissions resulting from combustion, including NOx and CO. This small increase does not meet the emission threshold identified in the definition of modification, as provided by 45CSR13.2.17.

This permit application also contains an update to the piping fugitives (FUG-02) to account for a typographical error resulting in an overall decrease to the facility-wide PTE for VOCs. It was discovered that in the original application, FUG-02 double-counted emissions related to compressor blowdown operations, which were separately filed for as FUG-01.

TABLE 3.1 CHANGES IN EMISSIONS FROM ADMINISTRATIVE UPDATE

		Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
Change in Potentials to Emit	**ID**	**NOx**	**CO**	**VOC**	**SO2**	**PMF**	**PMF-10**	**PMF-2.5**	**PMC**	**CO2**	**CH4**	**N2O**	**CO2e**	**NH3**	**Total HAP**
Total Net Change		0.38	0.08	(25.70)	(0.000)	(0.03)	(0.03)	(0.03)	(0.004)	(71.62)	2.11	0.000	(18.84)	0.000	(0.07)

TABLE 3.2 FACILITY-WIDE POTENTIAL EMISSIONS (TPY)

		Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
Proposed Emission Sources	**ID**	**NOx**	**CO**	**VOC**	**SO2**	**PMF**	**PMF-10**	**PMF-2.5**	**PMC**	**CO2**	**CH4**	**N2O**	**CO2e**	**NH3**	**Total HAP**
Emergency Generator 1	EG-01	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
Emergency Generator 2	EG-02	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
3,000 Gallon Pipeline Liquids Tank	TK-01	-	-	0.37	-	-	-	-	-	-	-	-	-	-	-
Solar Titan 130 Turbine	CT-01	15.01	27.87	1.43	2.53	4.36	4.36	4.36	10.8	90,196	7.40	2.27	91,059	10.2	1.35
Solar Mars 100 Turbine	CT-02	12.35	20.73	1.14	2.08	3.60	3.60	3.60	8.90	74,385	6.00	1.87	75,094	8.12	1.09
Solar Taurus 70 Turbine	CT-03	8.40	13.1	0.78	1.41	2.42	2.42	2.42	5.99	50,035	4.00	1.26	50,511	5.77	0.720
Solar Taurus 60 Turbine	CT-04	6.28	8.45	0.56	1.06	1.83	1.83	1.83	4.53	37,843	2.96	0.954	38,201	4.29	0.530
Fugitive Leaks - Blowdowns	FUG-01	-	-	24.7	-	-	-	-	-	25.6	844	-	21,124	-	1.40
Fugitive Leaks - Piping	FUG-02	-	-	1.24	-	-	-	-	-	1.28	42.3	-	1,059	-	0.070
Hydrocarbon (Waste Oil) Tank	TK-2	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-
Truck Loading Rack	LR-01	-	-	1.76E-05	-	-	-	-	-	-	-	-	-	-	5.77E-07
Total (tons/yr)		**42.53**	**70.66**	**30.33**	**7.08**	**12.21**	**12.21**	**12.21**	**30.21**	**252,518**	**906.95**	**6.36**	**277,088**	**28.38**	**5.22**

4.0 FEDERAL REGULATORY REQUIREMENTS

4.1 NEW SOURCE PERFORMANCE STANDARDS (NSPS)

NSPS have been established by the EPA to limit air pollutant emissions from certain categories of new and modified stationary sources. The NSPS regulations are contained in 40 CFR Part 60 and cover many different source categories, and applicable categories are described below.

4.1.1 40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels

This regulation applies to volatile organic liquid storage vessels with storage capacities greater than or equal to 75 cubic meters (19,812 gallons) for which construction, reconstruction, or modification commenced after July 23, 1984. There are no petroleum storage vessels with capacities greater than 19,812 gallons planned at the Marts Compressor Station, and this regulation is therefore not applicable to the facility.

4.1.2 40 CFR 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ was promulgated on Jan 8, 2008 and is applicable to new stationary spark ignition internal combustion engines depending upon model year and size category. The proposed emergency generators are subject to the NO_x, CO and VOC requirements of this subpart and will comply with the emission standards under this subpart. The proposed emergency generators will not change the applicability of this subpart currently reflected in R13-3271.

4.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

NESHAP regulations established in 40 CFR Part 61 and Part 63 regulate emission of air toxics. NESHAP standards primarily apply to major sources of Hazardous Air Pollutants (HAPs), though some Subparts of Part 63 have been revised to include area (non-major) sources. The NESHAP regulations under 40 CFR Part 61 establish emission standards on the pollutant basis whereas 40 CFR Part 63 establishes the standards on a source category basis. The Marts Compressor Station will not emit any single HAP in excess of 10 tpy and will not emit combined HAPS in excess of 25 tpy, and will therefore be designated as an area source of HAPs.

4.2.1 40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The emergency generator is subject to the NESHAP requirements under 40 CFR Part 63 Subpart ZZZZ (and applies to both major and area sources of HAPs). However, the NESHAP refers to the NSPS Subpart JJJJ for all applicable requirements. Therefore, compliance with the NSPS Subpart JJJJ requirements ensures compliance with the NESHAP requirements.

5.0 STATE REGULATORY APPLICABILITY

This section outlines the State air quality regulations that could be reasonably expected to apply to the Marts Compressor Station ancillary equipment changes and makes an applicability determination for each regulation based on activities planned at the Station and the emissions of regulated air pollutants associated with this project. This review is presented to supplement and/or add clarification to the information provided in the WVDEP Rule 13 permit application forms.

The regulatory requirements in reference to the Marts Compressor Station ancillary equipment changes are described in detail in Table 5-1.

TABLE 5.1 STATE REGULATORY APPLICABILITY

Regulatory Applicability	Applicable Requirement	Compliance Approach
Objectionable Odors (45 CSR 04)	Prevent the discharge of air pollutants that contribute to objectionable odors	Operations conducted at the compressor station are subject to this requirement. The facility is staffed and will use best practices to minimize odors.
Stationary Source Permitting (45 CSR 13)	A permit application is required to be submitted for the authority to construct and operate emission sources.	This permit application is being submitted to amend to the Marts Compressor Station R13 Permit..
New Source Performance Standards (45 CSR 16)	The Station is required to comply with applicable NSPS Standards.	See Section 4.1
NESHAP Rues (45 CSR 34)	The Station is required to comply with applicable NESHAP Rules.	See Section 4.2

6.0 PROPOSED COMPLIANCE DEMONSTRATIONS

The following methods are proposed for demonstrating ongoing compliance for the sources included in this administrative update:

Emergency Generators

Records of the monthly emergency and non-emergency usages will be maintained to confirm compliance with the annual limit for non-emergency operation. If a non-certified engine is installed or if a certified engine is installed but operated as non-certified an initial stack test and testing every 8760 operating hours or three years (whichever comes first) will be conducted.

APPENDICES

APPENDIX A

WVDAQ AIR PERMIT APPLICATION FORMS

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☒ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Atlantic Coast Pipeline, LLC.

2. Federal Employer ID No. ***(FEIN):***
47 - 1813950

3. Name of facility *(if different from above):*
Marts Compressor Station

4. The applicant is the:
☒ **OWNER** ☐ **OPERATOR** ☐ **BOTH**

5A. Applicant's mailing address:

707 Main St.
Richmond, VA 23219

5B. Facility's present physical address:

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **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 L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: **The applicant is the owner of the site.**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.):

Natural Gas Transmission Facility

10. North American Industry Classification System **(NAICS)** code for the facility:

486210

11A. DAQ Plant ID No. (for existing facilities only): **041-00176**	11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): **R13-3271**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** 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 B**.

Traveling along US-19 S from West Milford, WV turn right onto Gooseman Rd. Turn left onto Kincheloe Run Road and then after 0.15 miles take a right onto Hollick Run Road. Take the next right and continue up a dirt road until you reach Marts Compressor Station.

12.B. New site address (if applicable): **N/A**	12C. Nearest city or town: **West Milford**	12D. County: **Lewis**
12.E. UTM Northing (KM): **4,332.66**	12F. UTM Easting (KM): **545.53**	12G. UTM Zone: **17**

13. Briefly describe the proposed change(s) at the facility: **Changes to ancillary equipment including emergency generators and storage tanks.**

14A. Provide the date of anticipated installation or change: – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: **N/A**	14B. Date of anticipated Start-Up if a permit is granted: **2018**

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day **24** Days Per Week **7** Weeks Per Year **52**

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify **(Emergency Generators)**

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "***Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☒ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☐ **Responsible Official** / ☒ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 3/15/17 *(Please use blue ink)*

35B. Printed name of signee: Leslie Hartz		35C. Title: Vice President Pipeline Construction
35D. E-mail: leslie.hartz@dom.com	36E. Phone: (804) 771 - 4460	36F. FAX:
36A. Printed name of contact person (if different from above): Richard B. Gangle		36B. Title: Manager-Environmental Services
36C. E-mail: Richard.b.gangle@dom.com	36D. Phone: (804) 273-2814	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

Table of Contents

Attachment A

Business Certificate

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

ATLANTIC COAST PIPELINE, LLC

Control Number: 9A7TZ

a limited liability company, organized under the laws of the State of Delaware

has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of November 7, 2014, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

to the limited liability company authorizing it to transact business in West Virginia

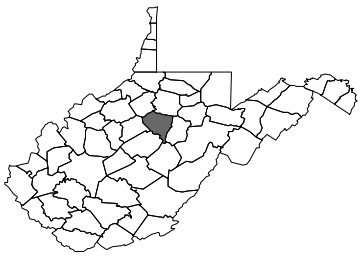
Given under my hand and the Great Seal of the State of West Virginia on this day of November 7, 2014

Natalie E Tennant

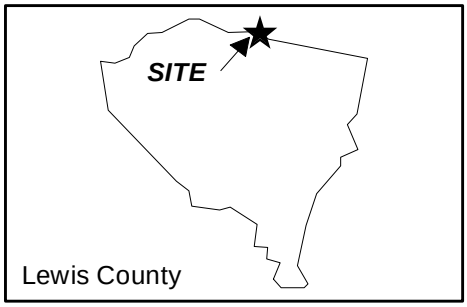
Secretary of State

Attachment B

Map(s)



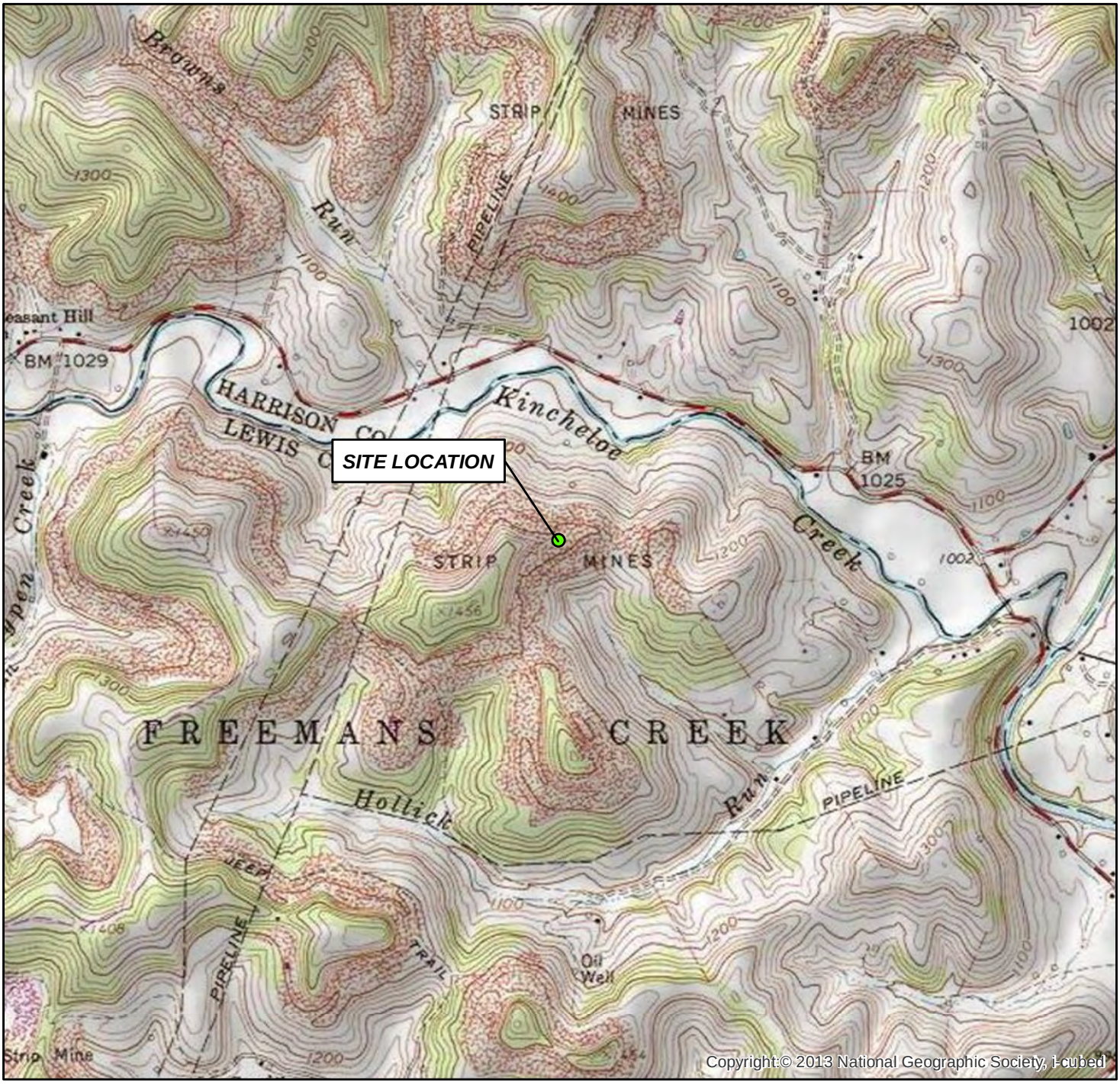
West Virginia



0 1,000 2,000 4,000 Feet

N

LAT. 39.14190 LON. -80.47318
LEWIS COUNTY
WEST VIRGINIA



USGS 1:24K 7.5' Quadrangle: West Milford, WV

SITE LOCATION MAP

Atlantic Coastal Pipeline Project

Marts Compressor Station
Atlantic Coastal Pipeline, LLC
Lewis County, West Virginia

GIS Review: GM

CHK'D: GM

0272413

Drawn By:
SRV 7/15/15

Environmental Resources Management

ATTACHMENT B

J:\GIS\Projects\Dominion Transmission Inc_MXD\AttachmentB_ACP1Station_SiteLocMap.mxd - 9/8/2015|SRV

Attachment C

Installation and Start Up Schedule

Attachment C
Schedule of Installation

The Marts Compressor Station commenced construction in November 2017. The anticipated start-up date is in the fourth quarter of 2019.

Attachment D

Regulatory Discussion

Attachment D - Regulatory Discussion

A state and federal regulatory discussion has been included in the narrative preceding the WVDAQ Permit Application Forms.

Attachment E

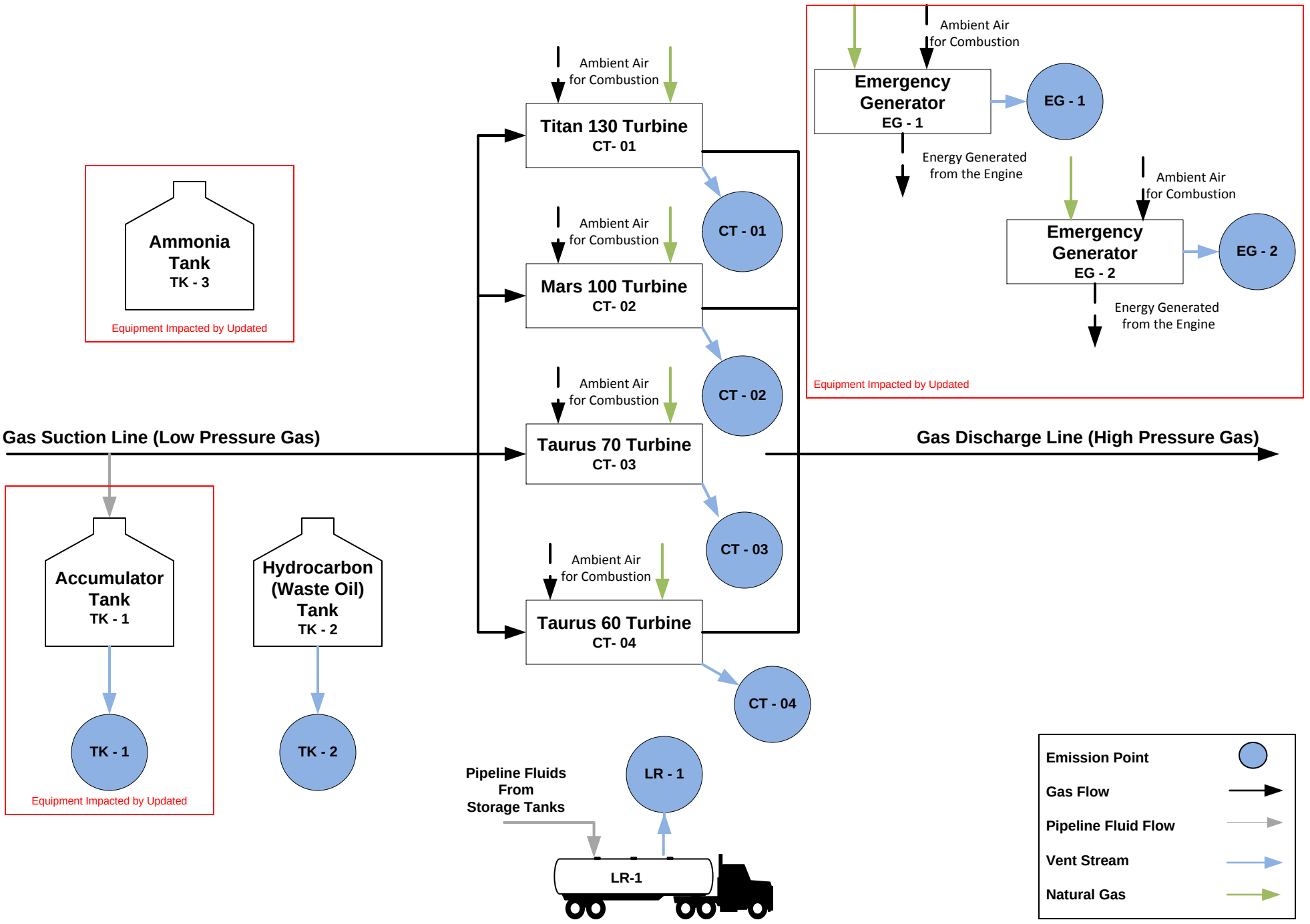
Plot Plan

Filed under separate cover in Appendix B and is marked "Contains Critical Energy Infrastructure Information - Do Not Release"

Attachment F

Detailed Process Flow Diagram(s)

Attachment F – Detailed Process Flow Diagram
Atlantic Coast Pipeline, LLC. – Marts Compressor Station



Attachment G

Process Description

Attachment G

Process Description

Atlantic Coast Pipeline, LLC is submitting this Rule 13 Permit Application for the Marts Compressor Station to comply with the permitting requirements of the state of West Virginia. Natural gas from the transmission pipeline is routed through this transmission station. The natural gas fueled turbines CT-01, CT-02, CT-03, and CT-4 provide the compression required for the transmission of natural gas along the Atlantic Coast Pipeline. The turbines manufactured by Solar Turbines include a Titan 130-20502S, Mars 100-16000S, Taurus 70-10802S, and Taurus 60-7800S.

The Marts Compressor Station will require two emergency generators (Caterpillar G3512) each with a capacity of 1,114 hp to provide backup power during emergency situations.

Produced liquids are temporarily stored in the pipeline liquids tank (TK - 1) until they can be removed off-site by the tank truck (LR-1). A hydrocarbon (waste oil) tank (TK-2), is also proposed to be at the Marts Compressor Station. Aqueous ammonia is stored in a 13,000 gallon tank (TK-3) for injection into the turbine exhaust for the control of nitrogen oxide (NO_X) emissions.

Attachment H

Material Safety Data Sheets (MSDS)

SECTION 1: CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CHEMICAL NAME: Ammonium Hydroxide **TRADE NAMES / SYNONYMS:** Aqua Ammonia, Ammonium Hydroxide

MANUFACTURER AND/OR DISTRIBUTOR:
Airgas Specialty Products
2530 Sever Road, 300
Lawrenceville, GA 30043 USA

EMERGENCY TELEPHONE NUMBERS:
Transportation (CHEMTREC): 1-800-424-9300
Environmental/Health/Safety (24-hr): 1-800-528-4963
Customer Service (Toll Free): 1-800-295-2225

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL	FORMULA	% BY WEIGHT	CAS	OSHA PEL	NIOSH REL / ACGIH TLV		IDLH
				25 ppm (California only)			
Ammonia	NH_3	5-19.9	7664-41-7	50 ppm (TWA)	25 ppm (TWA)	35 ppm (STEL)	300ppm
Water	H_2O	80.1-95	7732-18-5	None	None	None	
Aqua Ammonia	NH_4OH	100	1336-21-6	------	------	------	

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: **1.** Colorless liquid with a pungent odor. **2.** Avoid contact with liquid and vapor. **3.** Not flammable. **4.** Mixes with water. **5.** Harmful to aquatic life in very low concentrations. **6.** Stop discharge if possible.

POTENTIAL HEALTH EFFECT

ROUTES OF ENTRY: Inhalation, Skin Contact, Eye Contact, Ingestion **TARGET ORGANS:** Eyes, skin and respiratory system. **EYE CONTACT:** May be severely irritating upon liquid exposure, with irritation from fumes. **SKIN CONTACT:** High concentrations can cause severe irritation and burns. **INHALATION:** The gas can be suffocating and is irritating to the mucous membranes and lung tissue. **INGESTION:** Can cause vomiting, nausea and corrosive burns to the esophagus and stomach. The exact nature and intensity of toxic effects following ingestion of varying amounts of strong aqua ammonia solution (ex. 28%) is unpredictable. The most accepted view is that any amount from one teaspoon or greater can be dangerous if ingested.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush with large amounts of water for at least 15 minutes then immediately seek medical aid.
SKIN CONTACT: Immediately flush with large quantities of water for at least 15 minutes while removing clothing. Seek immediate medical aid.
INHALATION: Remove from exposure. If breathing has stopped or is difficult, administer artificial respiration or oxygen as needed. Seek immediate medical aid.
INGESTION: Do not induce vomiting. Have victim drink large quantities of water if conscious. Immediately seek medical aid. Never give anything by mouth to an unconscious person.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT(method used): Not Applicable **FLAMMABLE LIMITS:** 16-25% NH_3 in air (for labeling purposes, not DOT flammable gas). **EXTINGUISHING MEDIA:** Water fog or spray for escaping ammonia gas.
SPECIAL FIRE FIGHTING PROCEDURES: The mixture will not burn but escaping gas can burn in the range of 16-25% NH_3 in air. Wear full protective clothing and self-contained breathing apparatus in the pressure demand mode.
NFPA HAZARD CLASSIFICATION (Aqua): Health: 2 **Flammability:** 1 **Reactivity:** 0 (least-0 — 4-highest)

SECTION 6: ACCIDENTAL RELEASE MEASURES

In US, federal regulations require that a release of 1,000 lb. or more of ammonium hydroxide must be reported immediately to the National Response Center at (800) 424-8802, the SERC and the LEPC. In California, ALL releases must be reported to CUPA, state and local agencies. Additional state and local regulations may apply. **SUGGESTED LOCAL ACTION:** Releases will liberate irritating vapors. Spilled liquids should be contained and not washed into sewers or ground water. Prevent large quantities from contact with vegetation or waterways. Ammonium hydroxide is a regulated material and reporting of any release may be required. Any release of this material during the course of loading, transporting, unloading or temporary storage must be reported to the U.S. DOT as required by 49 CFR 171.15 and 171.16.

SECTION 7: HANDLING AND STORAGE

Store in ventilated containers or pressure vessels away from heat. Open containers cautiously in case of pressure build up. Zinc, copper and copper alloys such as brass are rapidly corroded by ammonium hydroxide.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Respiratory protection approved by NIOSH / MSHA for ammonia must be used when exposure limits are exceeded. Whether chemical canister respirator or self-contained breathing apparatus is sufficient for effective respiratory protection depends on the type and magnitude of exposure.
SKIN PROTECTION: Rubber gloves and rubber or other types of approved protective clothing should be used to prevent skin contact. A face shield should be used for increased protection from contact with liquid or vapor.
EYE PROTECTION: Chemical splash goggles, approved for use with ammonia, must be worn to prevent eye contact with liquid or vapor. A face shield should be used for increased protection from contact with liquid.
VENTILATION: Local positive pressure and/or exhaust ventilation should be used to reduce vapor concentrations in confined spaces. Ammonia vapor, being lighter than air, can be expected to dissipate to the upper atmosphere. Ammonia concentrations may also be reduced by the use of an appropriate absorbent or reactant material.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 160°F (10% Sol'n.)
SOLUBILITY IN WATER: Complete
MELTING POINT: Approx 15°F (10% Sol'n.)
PERCENT VOLATILE BY VOLUME: 100%
VAPOR PRESSURE: 130 mm Hg @ 80°F(10% Sol'n.)
SPECIFIC GRAVITY: 0.928 @ 60°F (19.5% Sol'n., water=1)
VAPOR DENSITY: 0.60 @ 32°F (Air=1)
pH: Approx. 11.6 for 1 N Sol'n. in water
APPEARANCE: Colorless, pungent liquid

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Material generally considered stable. Heating above ambient temperature causes the vapor pressure of ammonia to increase rapidly.
INCOMPATIBILITY (materials to avoid): Strong acids. Aqua ammonia reacts with bromine, chlorine, mercury, silver, silver solder, and hypochlorite (bleach) to form explosive compounds. Avoid use of metals containing copper or zinc.
HAZARDOUS DECOMPOSITION PRODUCTS: Heating and contact of vapors with very hot surfaces may form hydrogen. The decomposition temperature may be lowered to 575°F by contact with certain metals such as nickel.
HAZARDOUS POLYMERIZATION: Will not occur **CONDITIONS TO AVOID:** Not applicable

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICITY BY INGESTION: Grade 3; Oral Rat, LD_{50} = 350 mg/kg. Ammonia is a strong alkali and readily damages all body tissues. Ammonia is not a cumulative metabolic poison.

SECTION 12: ECOLOGICAL INFORMATION

AQUATIC TOXICITY: 6.25 ppm 24hr/Trout/Lethal/Freshwater; 15ppm 48hr/Sunfish/TLm/Tap Water
WATERFOWL TOXICITY: Data not available **BIOCHEMICAL OXYGEN DEMAND:** Data not available
FOOD CHAIN CONCENTRATION POTENTIAL: None

SECTION 13: DISPOSAL CONSIDERATIONS

Consult local, state or federal regulatory agencies for acceptable disposal procedures and disposal locations. Disposal in streams or sewers is generally contrary to federal, state, and local regulations. For Hazardous Waste Regulations call (800) 424-9346, the RCRA Hotline.

SECTION 14: TRANSPORT INFORMATION

	5-10% Ammonia Solutions	>10-19.9% Ammonia Solutions
Proper shipping name:	Corrosive Liquid, N.O.S. (contains ammonia)	Ammonium Hydroxide
DOT Hazard Class:	8	8
Identification Number:	UN1760	UN2672
Packing Group:	III	III

SECTION 15: REGULATORY INFORMATION

NOTICE: This product is subject to the reporting requirements of SARA (1986, Section 313 of Title III) and 40 CFR Part 370.
CERCLA/SUPERFUND, 40 CFR 117.302: Unpermitted releases of 1,000 lb. or more of ammonium hydroxide in any 24-hour period must be reported immediately to the NRC at 1-800-424-8802, the SERC, and the LEPC. Written follow-up is required to SERC & LEPC.
OSHA HAZARD COMMUNICATION RULE, 20 CFR 1910.1200: Aqua ammonia is a hazardous chemical.
TOXIC SUBSTANCE CONTROL ACT: This material is listed in the TSCA Inventory.
EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (SARA, TITLE III): Section 302 Extremely Hazardous Substance: Yes; Section 311/312 Hazardous Categories: Immediate (Acute) Health Hazards; Section 313 Toxic Chemical: Yes (as ammonia); **WHMIS:** One percent (1%) as ammonia. **CALIFORNIA PROPOSITION 65:** Reproductive: No Carcinogen: No
OSHA PROCESS SAFETY MANAGEMENT, 29 CFR 1910.119: This product is NOT subject to the Process Safety Management requirements of 29 CFR 1910.119.
EPA CHEMICAL ACCIDENTAL RELEASE PREVENTION, 40 CFR PART 68: This product is NOT subject to the Risk Management Plan requirements of 40 CFR Part 68. **DRINKING WATER:** Maximum use dosage in potable water is 10mg/l.

SECTION 16: OTHER INFORMATION

REASON FOR REVISION: 1. Addition of new Toll Free Customer Service Number in Section 1. 2. Revision to concentration range in section 2. 3. Revision to proper DOT Shipping Name. 4. Revision to EPCRA Section 302 information in Section 15; 6. Revised LEL and UEL. 7. Company Name Change. 8. Revised LEL and UEL. 9. Company Address Changed.
MSDS PREPARED BY: Airgas Specialty Products

Attachment I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
CT-01	CT-01	Turbine (Titan 130-20502S)	2018	20,500 bhp	No Change	SCR-01, OxCat-01
CT-02	CT-02	Turbine (Mars 100-16000S)	2018	15,900 bhp	No Change	SCR-02, OxCat-02
CT-03	CT-03	Turbine (Taurus 70-10802S)	2018	11,107 bhp	No Change	SCR-03, OxCat-03
CT-04	CT-04	Turbine (Taurus 60-7800S)	2018	7,684 bhp	No Change	SCR-04, OxCat-04
EG-01	EG-01	Emergency Generator (Caterpillar G3516C)	2018	2,098 bhp	Removed	None
EG-01	EG-01	Emergency Generator (Caterpillar G3512)	2018	1,114 bhp	New	None
EG-02	EG-02	Emergency Generator (Caterpillar G3512)	2018	1,114 bhp	New	None
TK-1	TK-1	Pipeline Liquids Tank	2018	3,000 gallons	Modified	None
TK-2	TK-2	Hydrocarbon (Waste Oil) Tank	2018	2,000 gallons	No Change	None
TK-3	TK-3	Ammonia Tank	2018	13,000 gallons	Modified	None
LR-1	LR-1	Tank Unloading Operations	2018	90 gallons/min	No Change	None

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J

Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
EG-01	**Upward Vertical Stack**	**EG-01**	**Emergency Generator**	**NA**	**NA**	**NA**	**NA**	**CO**	**5.35**	**0.27**	**5.35**	**0.27**	**Gas**	**AP-42, Vendor Guarantees**	**NA**
								NO_x	**4.91**	**0.25**	**4.91**	**0.25**			
								Total VOCs	**0.81**	**0.04**	**0.81**	**0.04**			
								$PM_{Filterable}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								$PM_{Condensable}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								$PM_{2.5}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								PM_{10}	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								Total HAPs	**0.66**	**0.03**	**0.66**	**0.03**			
								CO_2	**311.78**	**15.59**	**311.78**	**15.59**			
								CH_4	**3.54**	**0.18**	**3.54**	**0.18**			
								CO_2e	**400.36**	**20.02**	**400.36**	**20.02**			
EG-02	**Upward Vertical Stack**	**EG-02**	**Emergency Generator**	**NA**	**NA**	**NA**	**NA**	**CO**	**5.35**	**0.27**	**5.35**	**0.27**	**Gas**	**AP-42, Vendor Guarantees**	**NA**
								NO_x	**4.91**	**0.25**	**4.91**	**0.25**			
								Total VOCs	**0.81**	**0.04**	**0.81**	**0.04**			
								$PM_{Filterable}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								$PM_{Condensable}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								$PM_{2.5}$	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								PM_{10}	**<0.01**	**<0.01**	**<0.01**	**<0.01**			
								Total HAPs	**0.66**	**0.03**	**0.66**	**0.03**			
								CO_2	**311.78**	**15.59**	**311.78**	**15.59**			
								CH_4	**3.54**	**0.18**	**3.54**	**0.18**			
								CO_2e	**400.36**	**20.02**	**400.36**	**20.02**			

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb

VOC/20 minute batch).

6 Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

7 Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{0}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
EG-01	**0.5**	**840**	**311.74**	**61.12**	**1,273**	**28.00**	**4,332.66**	**545.53**
EG-02	**0.5**	**840**	**311.74**	**61.12**	**1,273**	**28.00**	**4,332.66**	**545.53**

Attachment K

Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	N/A	N/A	N/A	N/A	N/A	N/A
Unpaved Haul Roads	N/A	N/A	N/A	N/A	N/A	N/.A
Storage Pile Emissions	N/A	N/A	N/A	N/A	N/A	N/A
Loading/Unloading Operations	VOCs	<0.01	<0.01	<0.01	<0.01	AP-42 Section 5.2
Wastewater Treatment Evaporation & Operations	N/A	N/A	N/A	N/A	N/A	N/A
Equipment Leaks	VOCs	11.76	51.53	11.76	51.53	EPA-453
General Clean-up VOC Emissions	N/A	N/A	N/A	N/A	N/A	N/A
Pneumatically Actuated Valves	VOCs	0.02	0.08	0.02	0.08	EPA-453

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

Attachment L

Emissions Unit Data Sheet(s)

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT www.epa.gov/tnn/tanks.html), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (http://www.epa.gov/tnn/chief/).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name **Tank Area**	2. Tank Name **Pipeline Liquids Storage Tank**
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) **TK-1**	4. Emission Point Identification No. (as assigned on *Equipment List Form*) **NA**
5. Date of Commencement of Construction (for existing tanks) **2018**	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) **NA**	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). **NA**	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): **NA**	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. **3,000 gal**	
9A. Tank Internal Diameter (ft) **6.55**	9B. Tank Internal Height (or Length) (ft) **11.90**
10A. Maximum Liquid Height (ft) **11.00**	10B. Average Liquid Height (ft) **2.5**
11A. Maximum Vapor Space Height (ft) **11.00**	11B. Average Vapor Space Height (ft) **9.4**
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. **3,000 gallons**	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
12,500 gal	**34.25 gal**

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
4.17

15. Maximum tank fill rate (gal/min) **0.024**

16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
NA	**NA**

18. Type of tank (check all that apply):
☒ Fixed Roof ___vertical X horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☐ Pressurized ___ spherical ___ cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) Welded

20A. Shell Color **Light Grey**	20B. Roof Color **Light Grey**	20C. Year Last Painted **N/A**

21. Shell Condition (if metal and unlined):
☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig):

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☒ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft²)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. **Charleston, WV**
28. Daily Average Ambient Temperature (°F) **70 °F**
29. Annual Average Maximum Temperature (°F) **65.5 °F**
30. Annual Average Minimum Temperature (°F) **44.0 °F**
31. Average Wind Speed (miles/hr) **18 mph**
32. Annual Average Solar Insulation Factor (BTU/(ft² ·day)) **1,123**
33. Atmospheric Pressure (psia) **14.70**

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: Ambient	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	**Pipeline Fluids**		
39B.	CAS Number	**NA**		
39C.	Liquid Density (lb/gal)	**5.47**		
39D.	Liquid Molecular Weight (lb/lb-mole)	**84.91**		
39E.	Vapor Molecular Weight (lb/lb-mole)	**84.91**		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	**NA** **NA**		
Months Storage per Year 39H. From 39I. To	**January** **December**		

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method[1]
		Amount	Units		
***See calculations included in Attachment N.**					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L

Affected Sources Data

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		EG-02	
Engine Manufacturer and Model		CATERPILLAR G3512	
Manufacturer's Rated bhp/rpm		1,114 BHP @1800 RPM	
Source Status[2]		New Source (NS)	
Date Installed/Modified/Removed[3]		2018	
Engine Manufactured/Reconstruction Date[4]		NA	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[5]		No	
Engine, Fuel and Combustion Data	Engine Type[6]	LB4S	
	APCD Type[7]	NA	
	Fuel Type[8]	PG	
	H_2S (gr/100 scf)	0.25	
	Operating bhp/rpm	1,114 BHP @1800 RPM	
	BSFC (Btu/bhp-hr)	7,075	
	Fuel throughput (ft^3/hr)	8,700	
	Fuel throughput ($MMft^3$/yr)	0.87	
	Operation (hrs/yr)	100	
Reference[9]	Potential Emissions[10]	lbs/hr	tons/yr
Vendor Guarantee	NO_X	4.91	0.25
Vendor Guarantee	CO	5.35	0.27
Vendor Guarantee	VOC	0.81	0.04
AP-42 Chapter 3.2	SO_2	0.001	<0.001
AP-42 Chapter 3.2	PM_{10}	<0.001	<0.001
AP-42 Chapter 3.2	$PM_{2.5}$	<0.001	<0.001
AP-42 Chapter 3.2	PMcon	0.03	0.01
AP-42 Chapter 3.2	Total HAPs	0.66	0.03

Attachment L

Affected Sources Data

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*.

Attachment L

Affected Sources Data

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		EG-01	
Engine Manufacturer and Model		CATERPILLAR G3512	
Manufacturer's Rated bhp/rpm		1,114 BHP @1800 RPM	
Source Status[2]		New Source (NS)	
Date Installed/Modified/Removed[3]		2018	
Engine Manufactured/Reconstruction Date[4]		NA	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[5]		No	
Engine, Fuel and Combustion Data	Engine Type[6]	LB4S	
	APCD Type[7]	NA	
	Fuel Type[8]	PG	
	H_2S (gr/100 scf)	0.25	
	Operating bhp/rpm	1,114 BHP @1800 RPM	
	BSFC (Btu/bhp-hr)	7,075	
	Fuel throughput (ft^3/hr)	8,700	
	Fuel throughput ($MMft^3$/yr)	0.87	
	Operation (hrs/yr)	100	
Reference[9]	Potential Emissions[10]	lbs/hr	tons/yr
Vendor Guarantee	NO_X	4.91	0.25
Vendor Guarantee	CO	5.35	0.27
Vendor Guarantee	VOC	0.81	0.04
AP-42 Chapter 3.2	SO_2	0.001	<0.001
AP-42 Chapter 3.2	PM_{10}	<0.001	<0.001
AP-42 Chapter 3.2	$PM_{2.5}$	<0.001	<0.001
AP-42 Chapter 3.2	PMcon	0.03	0.01
AP-42 Chapter 3.2	Total HAPs	0.66	0.03

Attachment L

Affected Sources Data

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*.

Attachment M

Air Pollution Control Device Sheet(s)

Attachment M
Air Pollution Control Device Sheets

There are no APCD's included within this application for a Class II Administrative Update.

Attachment N

Supporting Emissions Calculations

Updated Table N-1 Permit to Construct Application Project Equipment List
ACP Marts Compressor Station - Lewis County, West Virginia

Emission Point ID	Source	Manufacturer	Model/Type	Rated Capacity
CT-01	Compressor Turbine	Solar Turbines	Titan 130-20502S	20,500 hp
CT-02	Compressor Turbine	Solar Turbines	Mars 100-16000S	15,900 hp
CT-03	Compressor Turbine	Solar Turbines	Taurus 70-10802S	11,107 hp
CT-04	Compressor Turbine	Solar Turbines	Taurus 60-7800S	7,684 hp
EG-01	**Emergency Generator**	**Caterpillar**	**G3512**	**750 kW**
EG-02	**Emergency Generator**	**Caterpillar**	**G3512**	**750 kW**
FUG-01	Fugitive Leaks - Blowdowns	--	--	-
FUG-02	**Fugitive Leaks - Piping**	**--**	**--**	**-**
TK-1	**Pipeline Liquids Tanks**	**--**	**--**	**3,000 gal**
TK-2	Waste Oil Tank	--	--	2,000 gal
TK-3	**Ammonia Tank**	**--**	**--**	**13,000 gal**
LR-01	Truck Loading Rack	--	--	90 gal/min

*Emission Units in **BOLD** are being changed with this submittal.

Updated Table N-2 Potential Emissions From Combustion Sources
ACP Marts Compressor Station - Lewis County, West Virginia

Generator Operational Parameters:

Normal Hours of Operation:		100

Pre-Control Potential to Emit

Combustion Sources	Power Rating	Units	Fuel	Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
				NOx	CO	VOC	SO2	PMF	PMF-10	PMF-2.5	PMC	CO2	CH4	N2O	CO2e	NH3	Total HAP
Emergency Generator 1	1,114	hp	Natural Gas	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.000	20.02	0.00	0.03
Emergency Generator 2	1,114	hp	Natural Gas	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.000	20.02	0.00	0.03
Total (tons/yr)				**0.49**	**0.54**	**0.08**	**1.67E-04**	**2.19E-05**	**2.19E-05**	**2.19E-05**	**2.81E-03**	**31.18**	**0.35**	**0.000**	**40.04**	**0.00**	**0.07**
Control Efficiencies				4.91	5.35	0.81	0.00	0.00	0.00	0.00	0.03	311.78	3.54	0.00	400.36	0.00	0.66

Control Technology	NOx	CO	VOC
Emergency Generator 1	N/A	N/A	N/A
Emergency Generator 2	N/A	N/A	N/A

Post-Control Potential to Emit

Combustion Sources	Power Rating	Units	Fuel	Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
				NOx	CO	VOC	SO2	PMF	PMF-10	PMF-2.5	PMC	CO2	CH4	N2O	CO2e	NH3	Total HAP
Emergency Generator 1	1,114	hp	Natural Gas	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
Emergency Generator 2	1,114	hp	Natural Gas	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
Total (tons/yr)				**0.49**	**0.54**	**0.08**	**1.67E-04**	**2.19E-05**	**2.19E-05**	**2.19E-05**	**2.81E-03**	**31.18**	**0.35**	**0.000**	**40.04**	**0.00**	**0.07**

Updated Table N-4 Combustion Source Criteria Pollutant Emission Factors

ACP Marts Compressor Station - Lewis County, West Virginia

Engine Emission Factors															
Equipment Type	**Fuel**	**Units**	**NOx**	**CO**	**VOC**	**SO2**	**PMF**	**PMF-10**	**PMF-2.5**	**PMC**	**CO2**	**CH4**	**N2O**	**CO2e**	**NH3**
Emergency Generator 1	Natural Gas	g/hp-hr	2.0	2.18	0.33	6.79E-04	8.89803E-05	8.89803E-05	8.89803E-05	0.01144	126.95	1.44261	0	163.015	0
Emergency Generator 2	Natural Gas	g/hp-hr	2.0	2.18	0.33	6.79E-04	8.89803E-05	8.89803E-05	8.89803E-05	0.01144	126.95	1.44261	0	163.015	0

Notes

(1) NOx, CO, and VOC emission factors for Caterpillar Egens taken from Caterpillar Manufacturer data.

(2) SO2, PMF, PMF-10, PMF-2.5, PMC, CO2, CH4, and N2O Emission factors for Caterpillar Egens taken from AP-42 Table 3.2-2 and converted using manufacturer fuel data

(3) Assume PMF=PMF-10=PMF-2.5

(4) CO2 GWP = 1; CH4 GWP = 25; N2O GWP = 298 [40 CFR 98]

Updated Table N-5 Hazardous Air Pollutant (HAP) Emissions From Combustion Sources
ACP Marts Compressor Station - Lewis County, West Virginia

Annual HAP Emissions (lb/yr)			
Pollutant	**HAP?**	**EG-01**	**EG-02**
1,1,2,2-Tetrachloroethane	Yes	3.5E-02	3.5E-02
1,1,2-Trichloroethane	Yes	2.8E-02	2.8E-02
1,1-Dichloroethane	Yes	2.1E-02	2.1E-02
1,2,3-Trimethylbenzene	No	2.0E-02	2.0E-02
1,2,4-Trimethylbenzene	No	1.3E-02	1.3E-02
1,2-Dichloroethane	Yes	2.1E-02	2.1E-02
1,2-Dichloropropane	Yes	2.4E-02	2.4E-02
1,3,5-Trimethylbenzene	No	3.0E-02	3.0E-02
1,3-Butadiene	Yes	2.4E-01	2.4E-01
1,3-Dichloropropene	Yes	2.3E-02	2.3E-02
2,2,4-Trimethylpentane	Yes	2.2E-01	2.2E-01
2-Methylnaphthalene	No	2.9E-02	2.9E-02
Acenaphthene	No	1.1E-03	1.1E-03
Acenaphthylene	No	4.9E-03	4.9E-03
Acetaldehyde	Yes	7.4E+00	7.4E+00
Acrolein	Yes	4.6E+00	4.6E+00
Benzene	Yes	3.9E-01	3.9E-01
Benzo(b)fluoranthene	No	1.5E-04	1.5E-04
Benzo(e)pyrene	No	3.7E-04	3.7E-04
Benzo(g,h,i)perylene	No	3.7E-04	3.7E-04
Biphenyl	Yes	1.9E-01	1.9E-01
Butane	No	4.8E-01	4.8E-01
Butyr/Isobutyraldehyde	No	9.0E-02	9.0E-02
Carbon Tetrachloride	Yes	3.3E-02	3.3E-02
Chlorobenzene	Yes	2.7E-02	2.7E-02
Chloroethane	Yes	1.7E-03	1.7E-03
Chloroform	Yes	2.5E-02	2.5E-02
Chrysene	No	6.1E-04	6.1E-04
Cyclopentane	No	2.0E-01	2.0E-01
Ethane	No	9.3E+00	9.3E+00
Ethylbenzene	Yes	3.5E-02	3.5E-02
Ethylene Dibromide	Yes	3.9E-02	3.9E-02
Fluoranthene	No	9.8E-04	9.8E-04
Fluorene	No	5.0E-03	5.0E-03
Formaldehyde	Yes	4.9E+01	4.9E+01
Hexane (or n-Hexane)	Yes	9.9E-01	9.9E-01
Methanol	Yes	2.2E+00	2.2E+00
Methylcyclohexane	No	1.1E+00	1.1E+00
Methylene Chloride	Yes	1.8E-02	1.8E-02
n-Nonane	No	9.8E-02	9.8E-02
n-Octane	No	3.1E-01	3.1E-01
n-Pentane	No	2.3E+00	2.3E+00
Naphthalene	Yes	6.6E-02	6.6E-02
PAH	Yes	2.4E-02	2.4E-02
Phenanthrene	No	9.2E-03	9.2E-03
Phenol	Yes	2.1E-02	2.1E-02
Propane	No	3.7E+01	3.7E+01
Pyrene	No	1.2E-03	1.2E-03
Styrene	Yes	2.1E-02	2.1E-02
Tetrachloroethane	No	2.2E-03	2.2E-03
Toluene	Yes	3.6E-01	3.6E-01
Vinyl Chloride+A32	Yes	1.3E-02	1.3E-02
Xylene	Yes	1.6E-01	1.6E-01
Total HAP/unit (TPY)		**0.033**	**0.033**

Hazardous Air Pollutant

Notes:
(1) Emissions above are on a per unit basis.
(2) Calculations for the emergency generator assume 100 hours of operation.

Update Table N-6 Combustion Source HAP Emission Factors
ACP Marts Compressor Station - Lewis County, West Virginia

Pollutant	HAP?	Emission Factors	
		EG-01	EG-02
		lb/MMBtu	lb/MMBtu
1,1,2,2-Tetrachloroethane	Yes	4.00E-05	4.00E-05
1,1,2-Trichloroethane	Yes	3.18E-05	3.18E-05
1,1-Dichloroethane	Yes	2.36E-05	2.36E-05
1,2,3-Trimethylbenzene	No	2.30E-05	2.30E-05
1,2,4-Trimethylbenzene	No	1.43E-05	1.43E-05
1,2-Dichloroethane	Yes	2.36E-05	2.36E-05
1,2-Dichloropropane	Yes	2.69E-05	2.69E-05
1,3,5-Trimethylbenzene	No	3.38E-05	3.38E-05
1,3-Butadiene	Yes	2.67E-04	2.67E-04
1,3-Dichloropropene	Yes	2.64E-05	2.64E-05
2,2,4-Trimethylpentane	Yes	2.50E-04	2.50E-04
2-Methylnaphthalene	No	3.32E-05	3.32E-05
Acenaphthene	No	1.25E-06	1.25E-06
Acenaphthylene	No	5.53E-06	5.53E-06
Acetaldehyde	Yes	8.36E-03	8.36E-03
Acrolein	Yes	5.14E-03	5.14E-03
Benzene	Yes	4.40E-04	4.40E-04
Benzo(b)fluoranthene	No	1.66E-07	1.66E-07
Benzo(e)pyrene	No	4.15E-07	4.15E-07
Benzo(g,h,i)perylene	No	4.14E-07	4.14E-07
Biphenyl	Yes	2.12E-04	2.12E-04
Butane	No	5.41E-04	5.41E-04
Butyr/Isobutyraldehyde	No	1.01E-04	1.01E-04
Carbon Tetrachloride	Yes	3.67E-05	3.67E-05
Chlorobenzene	Yes	3.04E-05	3.04E-05
Chloroethane	Yes	1.87E-06	1.87E-06
Chloroform	Yes	2.85E-05	2.85E-05
Chrysene	No	6.93E-07	6.93E-07
Cyclopentane	No	2.27E-04	2.27E-04
Ethane	No	1.05E-02	1.05E-02
Ethylbenzene	Yes	3.97E-05	3.97E-05
Ethylene Dibromide	Yes	4.43E-05	4.43E-05
Fluoranthene	No	1.10E-06	1.10E-06
Fluorene	No	5.67E-06	5.67E-06
Formaldehyde	Yes	2.00E-01	2.00E-01
Hexane (or n-Hexane)	Yes	1.11E-03	1.11E-03
Methanol	Yes	2.50E-03	2.50E-03
Methylcyclohexane	No	1.23E-03	1.23E-03
Methylene Chloride	Yes	2.00E-05	2.00E-05
n-Nonane	No	1.10E-04	1.10E-04
n-Octane	No	3.51E-04	3.51E-04
n-Pentane	No	2.60E-03	2.60E-03
Naphthalene	Yes	7.44E-05	7.44E-05
PAH	Yes	2.69E-05	2.69E-05
Phenanthrene	No	1.04E-05	1.04E-05
Phenol	Yes	2.40E-05	2.40E-05
Propane	No	4.19E-02	4.19E-02
Pyrene	No	1.36E-06	1.36E-06
Styrene	Yes	2.36E-05	2.36E-05
Tetrachloroethane	No	2.48E-06	2.48E-06
Toluene	Yes	4.08E-04	4.08E-04
Vinyl Chloride+A32	Yes	1.49E-05	1.49E-05
Xylene	Yes	1.84E-04	1.84E-04
Total Haps		2.19E-01	2.19E-01

Hazardous Air Pollutant

Notes:
(1) Emission factors for 4 SLB natural gas engines and Caterpillar natural gas emergency generators taken from AP-42 Table 3.2-2
(2) Emission factor for Formaldehyde for Caterpillar natural gas emergency generators is in units of g/bhp-hr, based on vendor specifications

Updated Table N-7 Potential Emissions From Combustion Sources

ACP Marts Compressor Station - Lewis County, West Virginia

Fugitive Emissions (FUG)

Source Designation:	FUG-02

Operational Parameters:

Annual Hours of Operation (hr/yr):	8,760

Pipeline Natural Gas Fugitive Emissions

Equipment	Service	Emission Factor[1]	Source Count[2]	Total HC Potential Emissions		VOC Weight Fraction	VOC Emissions	CO_2 Weight Fraction	CO_2 Emissions	CH_4 Weight Fraction	CH_4 Emissions	HAP Weight Fraction	HAP Emissions
		kg/hr/source		lb/hr	tpy		tpy		tpy		tpy		tpy
Valves	Gas	4.50E-03	952	9.44	41.4	0.026	1.08	0.0271	1.12	0.895	37.0	1.48E-03	0.061
Pump Seals	Gas	2.40E-03		0.000	0.000	0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Others (compressors and others)	Gas	8.80E-03	4	0.078	0.340	0.026	0.009	0.0271	0.009	0.895	0.304	1.48E-03	0.001
Connectors	Gas	2.00E-04	3	0.001	0.006	0.026	1.52E-04	0.0271	1.57E-04	0.895	0.005	1.48E-03	8.57E-06
Flanges	Gas	3.90E-04	658	0.566	2.48	0.026	0.065	0.0271	0.067	0.895	2.22	1.48E-03	0.004
Open-ended lines	Gas	2.00E-03		0.000	0.000	0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
			Total	10.1	44.2	-	1.16	-	1.20	-	39.5	-	0.065

1. EPA Protocol for Equipment Leaks Emissions Estimate (EPA-453/R-95-017) Table 2-4: Oil and Gas Production Operations Emission Factors.
2. Component count based on Basic Systems Engineering Estimate.
3. Source count for fugitive emissions includes equipment from ACP-1, ACP Kincheloe M&R station, and SHP CNX M&R Station.
4. SHP CNX M&R Station source counts based on Long Run M&R Station equipment counts.

Equations:

Potential Emissions (lb/hr) = Emission Factor (kg/hr/source) * Source Count * (2.20462 lb/1 kg)

Potential Emissions (tons/yr) = $(lb/hr)_{Potential}$ × Hours of Operation (hr/yr) × (1 ton/2,000 lb)

Pneumatically Actuated Valve Estimates

Valve Service	Valve Type	Valve Size	Gas Consumed Per Stroke (scf)	Number of Valves	Strokes/Yr Per Valve	VOC Weight Fraction	VOC Emissions (tpy)	CO_2 Weight Fraction	CO_2 Emissions (tpy)	CH_4 Weight Fraction	CH_4 Emissions (tpy)	HAP Weight Fraction	HAP Emissions (tpy)
Main Line Gates/LR Sites	Ball	42	274.2			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Firegates	Ball	36	201	3	2	0.026	0.001	0.0271	0.001	0.895	0.024	1.48E-03	3.97E-05
Station Bypass/Block Valves	Ball	36	201	1	24	0.026	0.003	0.0271	0.003	0.895	0.096	1.48E-03	1.59E-04
Station Firegate/Block Valves	Ball	30	164.4			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Filter/Sep Block	Ball	24	127.8	3	2	0.026	4.47E-04	0.0271	4.63E-04	0.895	0.015	1.48E-03	2.52E-05
Station Block Valves	Ball	20	109.5			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Station Block Valves	Ball	16	91.2			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Run Switching	Ball	16	91.2	4	365	0.026	0.078	0.0271	0.080	0.895	2.65	1.48E-03	0.004
Run Switching/Emergency SD	Ball	12	52.1			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Emergency SD	Plug	10	32.6	1	2	0.026	3.80E-05	0.0271	3.93E-05	0.895	0.001	1.48E-03	2.15E-06
Run Switching	Ball	10	32.6			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
Emergency SD	Ball	8	20.5	1	2	0.026	2.39E-05	0.0271	2.47E-05	0.895	0.001	1.48E-03	1.35E-06
Emergency SD	Plug	6	8.37	2	2	0.026	1.95E-05	0.0271	2.02E-05	0.895	0.001	1.48E-03	1.10E-06
Run Switching	Ball	6	8.37			0.026	0.000	0.0271	0.000	0.895	0.000	1.48E-03	0.000
					Total	-	0.082	-	0.085	-	2.79	-	0.005

Gas Stream Properties		
Volumetric Flow Rate	385	scf/lb-mol
Methane Molecular Weight	16	lb/lb-mol
Methane Percent Weight	0.934	%

Notes:

1. Valve information, gas consumption, number of valves, and strokes/year per valve based on engineering estimates.
2. Gas stream properties and weight fractions based on a natural gas hydrocarbon composition from Engineering Technology Incorporated Combustion Analysis.
3. Number of valves and strokes/year per valve includes equipment from ACP-1 and ACP Kincheloe M&R station.

Equations:

Pollutant Potential Emissions (tons/yr) = Gas Consumed Per Stroke (scf) x Number of Valves x Strokes Per Year Per Valve / Volumetric Flow Rate (scf/lb-mol) x Methane Molecular Weight (lb/lb-mol) / Methane Percent Weight (%) x Pollutant Weight Fraction x (1 lb / 2,000 ton)

Updated Table N-8a Tank Emissions
ACP Marts Compressor Station - Lewis County, West Virginia

Source Designation:	TK-1, TK-2, TK-3

Tank Parameters

Source	Type of Tank	Contents	Capacity	Throughput	Tank Diam.	Tank Length	Paint Color	Paint Condition
			(gal)	gal/yr	ft	ft		
TK-1	**Horizontal, fixed**	**Produced Fluids**	**3,000**	**15,000**	**6.55**	**11.9**	**Light Grey**	**Good**
TK-2	Horizontal, fixed	Waste Oil	2,000	10,000	4.12	10	Light Grey	Good

Total Emissions

Source	VOC Emissions							
	Flashing Losses		Working Losses		Breathing Losses		Total Losses	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-1[1]	**--**	**--**	**--**	**--**	**--**	**--**	**0.08**	**0.37**
TK-2[2]	NA	NA	1.03E-06	4.50E-06	2.98E-06	1.31E-05	4.01E-06	1.76E-05

1. Losses were calculated for TK-1 using E&P Tanks Software. See attached for output.
2. Losses were calculated for TK-2 using EPA's TANKS 4.09d software with default breather vent settings.
3. Losses (Emissions) from TK-3 13,000-gallon Ammonia tank assumed to be insignficant.

Updated Table N-9 Project Potential Emissions

ACP Marts Compressor Station - Lewis County, West Virginia

Existing Emission Sources	ID	Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
		NOx	CO	VOC	SO2	PMF	PMF-10	PMF-2.5	PMC	CO2	CH4	N2O	CO2e	NH3	Total HAP
Emergency Generator	EG-01	0.12	0.45	0.24	4.28E-04	2.79E-02	2.79E-02	2.79E-02	7.21E-03	103	1.03	0.00	129	0.0	0.14
2,500 Gallon Pipeline Liquids Tank	TK-01	-	-	1.76E-05	-	-	-	-	-	-	-	-	-	-	-
Solar Titan 130 Turbine	CT-01	15.01	27.87	1.43	2.53	4.36	4.36	4.36	10.8	90,196	7.40	2.27	91,059	10.2	1.35
Solar Mars 100 Turbine	CT-02	12.35	20.73	1.14	2.08	3.60	3.60	3.60	8.90	74,385	6.00	1.87	75,094	8.12	1.09
Solar Taurus 70 Turbine	CT-03	8.40	13.1	0.78	1.41	2.42	2.42	2.42	5.99	50,035	4.00	1.26	50,511	5.77	0.720
Solar Taurus 60 Turbine	CT-04	6.28	8.45	0.56	1.06	1.83	1.83	1.83	4.53	37,843	2.96	0.954	38,201	4.29	0.530
Fugitive Leaks - Blowdowns	FUG-01	-	-	24.7	-	-	-	-	-	25.6	844	-	21,124	-	1.40
Fugitive Leaks - Piping	FUG-02	-	-	26.80	-	-	-	-	-	1.20	39.5	-	990	-	0.065
Hydrocarbon (Waste Oil) Tank	TK-2	-	-	0.35	-	-	-	-	-	-	-	-	-	-	-
Truck Loading Rack	LR-01	-	-	0.006	-	-	-	-	-	-	-	-	-	-	5.77E-07
Total (tons/yr)		**42.16**	**70.58**	**56.03**	**7.08**	**12.24**	**12.24**	**12.24**	**30.21**	**252,590**	**904.84**	**6.36**	**277,107**	**28.38**	**5.29**

Proposed Emission Sources	ID	Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
		NOx	CO	VOC	SO2	PMF	PMF-10	PMF-2.5	PMC	CO2	CH4	N2O	CO2e	NH3	Total HAP
Emergency Generator 1	EG-01	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
Emergency Generator 2	EG-02	0.25	0.27	0.04	8.33E-05	1.09E-05	1.09E-05	1.09E-05	1.40E-03	15.59	0.18	0.00	20.02	0.00	0.03
3,000 Gallon Pipeline Liquids Tank	TK-01	-	-	0.37	-	-	-	-	-	-	-	-	-	-	-
Solar Titan 130 Turbine	CT-01	15.01	27.87	1.43	2.53	4.36	4.36	4.36	10.8	90,196	7.40	2.27	91,059	10.2	1.35
Solar Mars 100 Turbine	CT-02	12.35	20.73	1.14	2.08	3.60	3.60	3.60	8.90	74,385	6.00	1.87	75,094	8.12	1.09
Solar Taurus 70 Turbine	CT-03	8.40	13.1	0.78	1.41	2.42	2.42	2.42	5.99	50,035	4.00	1.26	50,511	5.77	0.720
Solar Taurus 60 Turbine	CT-04	6.28	8.45	0.56	1.06	1.83	1.83	1.83	4.53	37,843	2.96	0.954	38,201	4.29	0.530
Fugitive Leaks - Blowdowns	FUG-01	-	-	24.7	-	-	-	-	-	25.6	844	-	21,124	-	1.40
Fugitive Leaks - Piping	FUG-02	-	-	1.24	-	-	-	-	-	1.28	42.3	-	1,059	-	0.070
Hydrocarbon (Waste Oil) Tank	TK-2	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-
Truck Loading Rack	LR-01	-	-	1.76E-05	-	-	-	-	-	-	-	-	-	-	5.77E-07
Total (tons/yr)		**42.53**	**70.66**	**30.33**	**7.08**	**12.21**	**12.21**	**12.21**	**30.21**	**252,518**	**906.95**	**6.36**	**277,088**	**28.38**	**5.22**

Change in Potentials to Emit	ID	Criteria Pollutants (tpy)								GHG Emissions (tpy)				Ammonia (tpy)	HAP (tpy)
		NOx	CO	VOC	SO2	PMF	PMF-10	PMF-2.5	PMC	CO2	CH4	N2O	CO2e	NH3	Total HAP
Total Net Change		0.38	0.08	(25.70)	(0.000)	(0.03)	(0.03)	(0.03)	(0.004)	(71.62)	2.11	0.000	(18.84)	0.000	(0.07)

G3512

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1800	RATING STRATEGY:	EMERGENCY
COMPRESSION RATIO:	9.7	APPLICATION:	GENSET
AFTERCOOLER TYPE:	SCAC	RATING LEVEL:	STANDBY
AFTERCOOLER - STAGE 2 INLET (°F):	130	FUEL:	NAT GAS
AFTERCOOLER - STAGE 1 INLET (°F):	203	FUEL SYSTEM:	CAT LOW PRESSURE
JACKET WATER OUTLET (°F):	210		WITH AIR FUEL RATIO CONTROL
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	0.5-5.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	85
CONTROL SYSTEM:	ADEM4 W/ IM	FUEL LHV (Btu/scf):	905
EXHAUST MANIFOLD:	DRY	ALTITUDE CAPABILITY AT 77°F INLET AIR TEMP. (ft):	9843
COMBUSTION:	LOW EMISSION	POWER FACTOR:	0.8
NOx EMISSION LEVEL (g/bhp-hr NOx):	2.0	VOLTAGE(V):	480-4160

RATING		NOTES	LOAD	100%	75%	50%
GENSET POWER	(WITHOUT FAN)	(2)(3)	ekW	785	589	393
GENSET POWER	(WITHOUT FAN)	(2)(3)	kVA	981	736	491
ENGINE POWER	(WITHOUT FAN)	(3)	bhp	1114	841	571
GENERATOR EFFICIENCY		(2)	%	94.5	93.9	92.2
GENSET EFFICIENCY(@ 1.0 Power Factor)	(ISO 3046/1)	(4)	%	35.3	33.7	30.4
THERMAL EFFICIENCY		(5)	%	49.5	50.9	52.8
TOTAL EFFICIENCY (@ 1.0 Power Factor)		(6)	%	84.8	84.6	83.2
ENGINE DATA						
GENSET FUEL CONSUMPTION	(ISO 3046/1)	(7)	Btu/ekW-hr	9849	10338	11490
GENSET FUEL CONSUMPTION	(NOMINAL)	(7)	Btu/ekW-hr	10041	10539	11713
ENGINE FUEL CONSUMPTION	(NOMINAL)	(7)	Btu/bhp-hr	7075	7379	8053
AIR FLOW (77°F, 14.7 psia)	(WET)	(8) (9)	ft3/min	2397	1860	1345
AIR FLOW	(WET)	(8) (9)	lb/hr	10628	8246	5966
FUEL FLOW (60ºF, 14.7 psia)			scfm	145	114	85
COMPRESSOR OUT PRESSURE			in Hg(abs)	69.3	56.7	44.2
COMPRESSOR OUT TEMPERATURE			°F	262	215	163
AFTERCOOLER AIR OUT TEMPERATURE			°F	137	138	138
INLET MAN. PRESSURE		(10)	in Hg(abs)	62.0	49.2	36.5
INLET MAN. TEMPERATURE	(MEASURED IN PLENUM)	(11)	°F	137	138	138
TIMING			°BTDC	32	32	32
EXHAUST TEMPERATURE - ENGINE OUTLET		(12)	°F	997	1004	1004
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(13) (9)	ft3/min	7013	5473	3965
EXHAUST GAS MASS FLOW	(WET)	(13) (9)	lb/hr	11027	8560	6199
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)		(14)(15)	g/bhp-hr	2.00	2.00	2.00
CO		(14)(16)	g/bhp-hr	1.86	1.95	2.18
THC (mol. wt. of 15.84)		(14)(16)	g/bhp-hr	2.23	2.42	2.73
NMHC (mol. wt. of 15.84)		(14)(16)	g/bhp-hr	0.38	0.41	0.46
NMNEHC (VOCs) (mol. wt. of 15.84)		(14)(16)(17)	g/bhp-hr	0.27	0.29	0.33
HCHO (Formaldehyde)		(14)(16)	g/bhp-hr	0.17	0.18	0.20
CO2		(14)(16)	g/bhp-hr	490	512	557
EXHAUST OXYGEN		(14)(18)	% DRY	9.1	8.9	8.6
LAMBDA		(14)(18)		1.69	1.67	1.63
ENERGY BALANCE DATA						
LHV INPUT		(19)	Btu/min	131364	103413	76624
HEAT REJECTION TO JACKET WATER (JW)		(20)(28)	Btu/min	20785	18695	16274
HEAT REJECTION TO ATMOSPHERE		(21)	Btu/min	5713	4931	4715
HEAT REJECTION TO LUBE OIL (OC)		(22)(28)	Btu/min	4297	3833	3271
HEAT REJECTION TO EXHAUST (LHV TO 77°F)		(23)(24)	Btu/min	46579	36542	26543
HEAT REJECTION TO EXHAUST (LHV TO 248°F)		(23)	Btu/min	37211	29201	21168
HEAT REJECTION TO A/C - STAGE 1 (1AC)		(25)(28)	Btu/min	2073	325	-798
HEAT REJECTION TO A/C - STAGE 2 (2AC)		(26)(29)	Btu/min	3705	2459	1439
PUMP POWER		(27)	Btu/min	971	971	971

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.60 in Hg barometric pressure.) No overload permitted at rating shown. Consult the altitude deration factor chart for applications that exceed the rated altitude 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.

For notes information consult page three.

FUEL USAGE GUIDE

CAT METHANE NUMBER	65	70	75	80	85	100
DERATION FACTOR	0	1	1	1	1	1

ALTITUDE DERATION FACTORS AT RATED SPEED

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1	1	1	1	1	0.97	0.90	0.84	0.77	0.70	0.63	0.56	No Rating
120	1	1	1	1	1	1	1	1	0.96	0.90	0.84	0.77	0.68
110	1	1	1	1	1	1	1	1	1	1	0.98	0.90	0.82
100	1	1	1	1	1	1	1	1	1	1	1	1	0.95
90	1	1	1	1	1	1	1	1	1	1	1	1	0.99
80	1	1	1	1	1	1	1	1	1	1	1	1	1
70	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1	1	1	1	1

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS (ACHRF)

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.51	1.59	1.67	1.75	1.83	1.91	2	2.08	2.17	2.26	2.35	2.45	No Rating
120	1.41	1.48	1.56	1.64	1.72	1.80	1.89	1.97	2.06	2.15	2.24	2.33	2.42
110	1.31	1.38	1.46	1.53	1.61	1.69	1.77	1.86	1.94	2.03	2.12	2.21	2.30
100	1.20	1.28	1.35	1.43	1.50	1.58	1.66	1.74	1.83	1.91	2	2.09	2.18
90	1.10	1.17	1.24	1.32	1.39	1.47	1.55	1.63	1.71	1.80	1.88	1.97	2.06
80	1	1.07	1.14	1.21	1.29	1.36	1.44	1.52	1.60	1.68	1.77	1.85	1.94
70	1	1	1.03	1.10	1.18	1.25	1.33	1.41	1.48	1.57	1.65	1.73	1.82
60	1	1	1	1	1.07	1.14	1.22	1.29	1.37	1.45	1.53	1.61	1.70
50	1	1	1	1	1	1.03	1.10	1.18	1.26	1.33	1.41	1.49	1.58

ALTITUDE (FEET ABOVE SEA LEVEL)

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.

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. The derate factors shown do not take into account external cooling system capacity. The derate factors provided assume the external cooling system can maintain the specified cooling water temperatures at site conditions.

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-Altitude/Temperature Deration) + (1-RPC))

AFTERCOOLER HEAT REJECTION FACTORS(ACHRF):

To maintain a constant air inlet manifold temperature, as the inlet air 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 (ACHRF) to adjust for inlet air temp and altitude conditions. See notes 28 and 29 for application of this factor in calculating the heat exchanger sizing criteria. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

NOTES:

1. Fuel pressure range specified is to the engine fuel control valve. Additional fuel train components should be considered in pressure and flow calculations.
2. Generator efficiencies, power factor, and voltage are based on standard generator. [Genset Power (ekW) is calculated as: Engine Power (bkW) x Generator Efficiency], [Genset Power (kVA) is calculated as: Engine Power (bkW) x Generator Efficiency / Power Factor]
3. Rating is with two engine driven water pumps. Tolerance is (+)3, (-)0% of full load.
4. Genset Efficiency published in accordance with ISO 3046/1, based on a 1.0 power factor.
5. Thermal Efficiency is calculated based on energy recovery from the jacket water, lube oil, 1st stage aftercooler, and exhaust to 248ºF with engine operation at ISO 3046/1 Genset Efficiency, and assumes unburned fuel is converted in an oxidation catalyst.
6. Total efficiency is calculated as: Genset Efficiency + Thermal Efficiency. Tolerance is ±10% of full load data.
7. ISO 3046/1 Genset fuel consumption tolerance is (+)5, (-)0% at the specified power factor. Nominal genset and engine fuel consumption tolerance is ± 3.0% of full load data at the specified power factor.
8. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.
9. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.
10. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.
11. Inlet manifold temperature is a nominal value with a tolerance of ± 9°F.
12. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
13. Exhaust flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 6 %.
14. Emissions data is at engine exhaust flange prior to any after treatment.
15. NOx values are the maximum values expected under steady state conditions.
16. CO, CO2, THC, NMHC, NMNEHC, and HCHO are the maximum values expected under steady state conditions. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.
17. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
18. 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.
19. LHV rate tolerance is ± 3.0%.
20. Heat rejection to jacket water value displayed includes heat to jacket water alone. Value is based on treated water. Tolerance is ± 10% of full load data.
21. Heat rejection to atmosphere based on treated water. Tolerance is ± 50% of full load data.
22. Lube oil heat rate based on treated water. Tolerance is ± 20% of full load data.
23. Exhaust heat rate based on treated water. Tolerance is ± 10% of full load data.
24. Heat rejection to exhaust (LHV to 77°F) value shown includes unburned fuel and is not intended to be used for sizing or recovery calculations.
25. Heat rejection to A/C - Stage 1 based on treated water. Tolerance is ±5% of full load data.
26. Heat rejection to A/C - Stage 2 based on treated water. Tolerance is ±5% of full load data.
27. Pump power includes engine driven jacket water and aftercooler water pumps. Engine brake power includes effects of pump power.
28. Total Jacket Water Circuit heat rejection is calculated as: (JW x 1.1) + (OC x 1.2) + (1AC x 1.05) + [0.76 x (1AC + 2AC) x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.
29. Total Second Stage Aftercooler Circuit heat rejection is calculated as: (2AC x 1.05) + [(1AC + 2AC) x 0.24 x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.

FREE FIELD MECHANICAL & EXHAUST NOISE

MECHANICAL: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	Overall	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
785	100	1114	122.9	107.7	109.4	113.7	110.6	108.2	113.1	111.5	112.0	111.4	109.6
589	75	841	122.2	107.0	108.4	113.9	109.9	108.1	112.9	111.7	111.3	111.1	109.3
393	50	571	121.9	107.0	107.5	113.6	107.7	107.4	113.0	111.7	111.8	110.9	109.1

MECHANICAL: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
785	100	1114	109.8	109.0	108.4	106.8	107.5	106.5	105.1	105.8	112.6	103.1	100.6
589	75	841	109.5	108.3	108.0	105.8	106.5	104.9	104.3	108.6	101.3	99.4	98.5
393	50	571	109.1	107.9	107.6	105.7	105.1	104.9	109.3	100.3	99.3	97.2	94.2

EXHAUST: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	Overall	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
785	100	1114	128.6	113.8	121.1	115.0	117.9	120.5	122.3	120.2	112.9	113.8	114.3
589	75	841	127.0	113.5	121.1	113.3	115.3	118.3	119.5	118.6	112.6	112.3	112.2
393	50	571	126.3	112.8	120.7	112.6	114.3	117.3	118.8	118.5	111.7	110.2	110.1

EXHAUST: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
785	100	1114	110.6	105.8	104.7	100.1	99.1	99.3	96.3	92.4	97.8	87.6	83.4
589	75	841	108.7	104.8	102.9	97.0	96.6	96.6	94.2	94.2	87.0	85.9	80.7
393	50	571	107.3	103.8	101.8	95.1	94.5	94.9	95.2	88.5	88.8	80.9	75.4

SOUND PARAMETER DEFINITION:

Sound Power Level Data - DM8702-03

Sound power is defined as the total sound energy emanating from a source irrespective of direction or distance. Sound power level data is presented under two index headings:
Sound power level -- Mechanical
Sound power level -- Exhaust

Mechanical: Sound power level data is calculated in accordance with ISO 3747. The data is recorded with the exhaust sound source isolated.

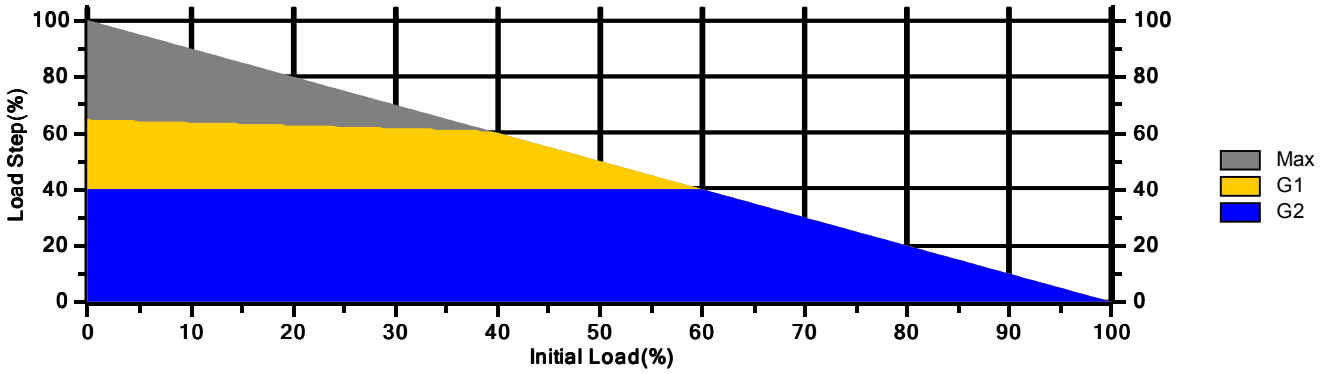
Exhaust: Sound power level data is calculated in accordance with ISO 6798 Annex A. Exhaust data is post-catalyst on gas engine ratings labeled as "Integrated Catalyst".

Measurements made in accordance with ISO 3747 and ISO 6798 for mechanical and exhaust sound level only. Frequency bands outside the displayed ranges are not measured, due to physical test, and environmental conditions that affect the accuracy of the measurement. No cooling system noise is included unless specifically indicated. Sound level data is indicative of noise levels recorded on one engine sample in a survey grade 3 environment.

How an engine is packaged, installed and the site acoustical environment will affect the site specific sound levels. For site specific sound level guarantees, sound data collection needs to be done on-site or under similar conditions.

"Heat Soaked"

Load Acceptance



Transient Load Acceptance					
Load Step	Frequency Deviation +/- (%)	Voltage Deviation +/- (%)	Recovery Time (sec)	Classification as Defined by ISO 8528 - 5	Notes
100	+1/-15	+2/-45	12		
75	+2/-14	+3/-40	6.5		
50	+2/-11	+1/-21	5	G1	2
40	+1/-9	+2/-17	5	G2	3
30	+1/-6	+1/-12	4.5	G2	3
20	+1/-5	+1/-8	4.5	G2	3
10	+2/-4	+1/-6	4.5	G2	3
Breaker Open	+11/-2	+12/-2	3.5		1
Recovery Specification	+3.5/-3.5	+5/-5			
Steady State Specification	+2.5/-2.5	+5/-5			

Transient Information

The transient load steps listed above are stated as a percentage of the engine's full rated load as indicated in the appropriate performance technical data sheet. Site ambient conditions, fuel quality, inlet/exhaust restriction and emissions settings will all affect engine response to load change. Engines that are not operating at the standard conditions stated in the Technical data sheet should be set up according to the guidelines included in the technical data; applying timing changes and/or engine derates as needed. Adherence to the engine settings guidelines will allow the engines to retain the transient performance stated in the tables above as a percentage of the site derated power (where appropriate). Fuel supply pressure and stability is critical to transient performance. Proper installation requires that all fuel train components (including filters, shut off valves, and regulators) be sized to ensure adequate fuel be delivered to the engine. The following are fuel pressure requirements to be measured at the engine mounted fuel control valve.

a. Steady State Fuel Pressure Stability +/- .15 psi/sec
b. Transient fuel Pressure Stability +/- .15 psi/sec

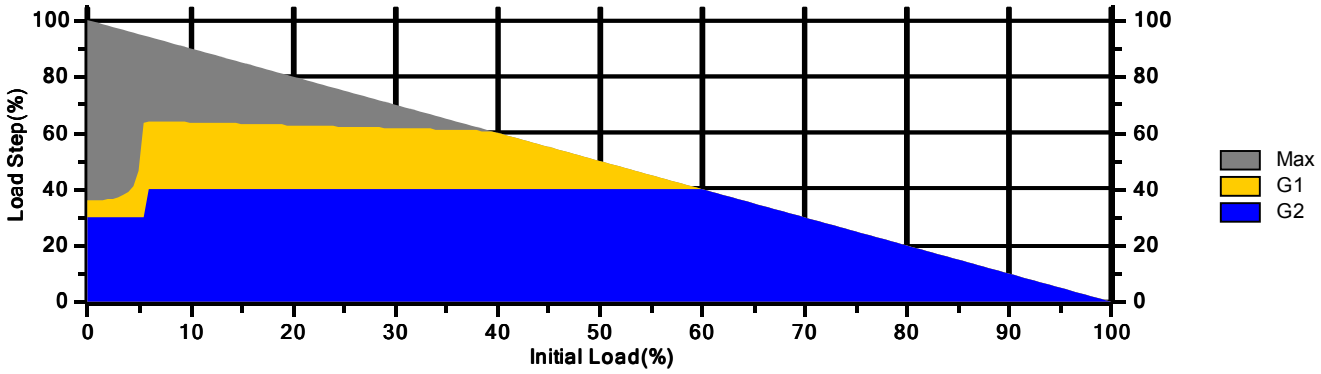
Inlet water temperature to the SCAC must be maintained at specified value for all engines. It is important that the external cooling system design is able to maintain the Inlet water temp to the SCAC to within +/- 1 °C during all engine-operating cycles. The SCAC inlet temperature stability criterion is to maintain stable inlet manifold air temperature. The Air Fuel Ratio control system requires up to 180 seconds to converge after a load step has been performed for NOx to return to nominal setting. If the stabilization time is not met between load steps the transient performance listed in the document may not be met. Differences in generator inertia may change the transient response of engine. Engine Governor gains and Voltage regulator settings may need to be tuned for site conditions. Engines must be maintained in accordance to guidelines specified in the Caterpillar Service Manuals applicable to each engine. Wear of components outside of the specified tolerances will affect the transient capability of the engine. Transient performance data is representative of a "Hot" (previously loaded or fully heat soaked) genset.

NOTES

1. For unloading the engine to 0% load from a loaded condition no external input is needed. The engine control algorithm employs a load sensing strategy to determine a load drop. In the event that the local generator breaker opens the strategy provides control to the engine that resets all control inputs to the rated idle condition. This prevents engine over speeding and will allow the engine to remain running unloaded at the rated synchronous speed.
2. The engines specified above have been tested against the voltage deviation, frequency deviation, and recovery time requirements defined in ISO 8528 - 5. At this time the engines stated above will meet class G1 transient performance as defined by ISO 8528 - 5 with exceptions.
3. The engines specified above have been tested against the voltage deviation, frequency deviation, and recovery time requirements defined in ISO 8528 - 5. At this time the engines stated above will meet class G2 transient performance as defined by ISO 8528 - 5 with exceptions.

"Cold Soaked"

Load Acceptance



Transient Load Acceptance					
Load Step	Frequency Deviation +/- (%)	Voltage Deviation +/- (%)	Recovery Time (sec)	Classification as Defined by ISO 8528 - 5	Notes
100	+3/-18	+3/-50	50		
75	+3/-18	+3/-50	50		
50	+3/-13	+1/-24	35		
40	+3/-9	+6/-24	20		
30	+2/-6	+1/-12	5	G2	3
20	+1/-5	+1/-8	4.5	G2	3
10	+2/-4	+1/-6	4.5	G2	3
Breaker Open	+11/-2	+12/-2	3.5		1
Recovery Specification	+3.5/-3.5	+5/-5			
Steady State Specification	+2.5/-2.5	+5/-5			

Transient Information

The transient load steps listed above are stated as a percentage of the engine's full rated load as indicated in the appropriate performance technical data sheet. Site ambient conditions, fuel quality, inlet/exhaust restriction and emissions settings will all affect engine response to load change. Engines that are not operating at the standard conditions stated in the Technical data sheet should be set up according to the guidelines included in the technical data; applying timing changes and/or engine derates as needed. Adherence to the engine settings guidelines will allow the engines to retain the transient performance stated in the tables above as a percentage of the site derated power (where appropriate). Fuel supply pressure and stability is critical to transient performance. Proper installation requires that all fuel train components (including filters, shut off valves, and regulators) be sized to ensure adequate fuel be delivered to the engine. The following are fuel pressure requirements to be measured at the engine mounted fuel control valve.

a. Steady State Fuel Pressure Stability +/- .15 psi/sec
b. Transient fuel Pressure Stability +/- .15 psi/sec

Inlet water temperature to the SCAC must be maintained at specified value for all engines. It is important that the external cooling system design is able to maintain the Inlet water temp to the SCAC to within +/- 1 °C during all engine-operating cycles. The SCAC inlet temperature stability criterion is to maintain stable inlet manifold air temperature. The Air Fuel Ratio control system requires up to 180 seconds to converge after a load step has been performed for NOx to return to nominal setting. If the stabilization time is not met between load steps the transient performance listed in the document may not be met. Differences in generator inertia may change the transient response of engine. Engine Governor gains and Voltage regulator settings may need to be tuned for site conditions. Engines must be maintained in accordance to guidelines specified in the Caterpillar Service Manuals applicable to each engine. Wear of components outside of the specified tolerances will affect the transient capability of the engine. Transient performance data is representative of a "Cold" genset, which is typical for initial loading in standby applications. The data assumes any subsequent load steps are applied to a "Hot" (previously loaded or fully heat soaked) genset. Insufficient warm up time may result in reduced transient performance.

NOTES

1. For unloading the engine to 0% load from a loaded condition no external input is needed. The engine control algorithm employs a load sensing strategy to determine a load drop. In the event that the local generator breaker opens the strategy provides control to the engine that resets all control inputs to the rated idle condition. This prevents engine over speeding and will allow the engine to remain running unloaded at the rated synchronous speed.
2. The engines specified above have been tested against the voltage deviation, frequency deviation, and recovery time requirements defined in ISO 8528 - 5. At this time the engines stated above will meet class G1 transient performance as defined by ISO 8528 - 5 with exceptions.
3. The engines specified above have been tested against the voltage deviation, frequency deviation, and recovery time requirements defined in ISO 8528 - 5. At this time the engines stated above will meet class G2 transient performance as defined by ISO 8528 - 5 with exceptions.

```
*****************************************************************************************
*     Project Setup Information                                                         *
*****************************************************************************************
Project File               : M:\Projects\D\Dominion\Atlantic Coastal Pipeline and Supply Header Pipeline\Draft Ru
Flowsheet Selection        : Oil Tank with Separator
Calculation Method         : AP42
Control Efficiency         : 100.0%
Known Separator Stream     : Low Pressure Gas
Entering Air Composition   : No

Date                       : 2015.07.13


*****************************************************************************************
*     Data Input                                                                        *
*****************************************************************************************

Separator Pressure         : 552.00[psig]
Separator Temperature      : 77.00[F]
Molar GOR                  : 0.0500
Ambient Pressure           : 14.70[psia]
Ambient Temperature        : 70.00[F]
C10+ SG                    : 0.8990
C10+ MW                    : 166.00

-- Low Pressure Gas ---------------------------------------------------------------------
   No.    Component            mol %
   1      H2S                   0.0000
   2      O2                    0.0000
   3      CO2                   1.0410
   4      N2                    0.9940
   5      C1                   94.2060
   6      C2                    2.9230
   7      C3                    0.5460
   8      i-C4                  0.0790
   9      n-C4                  0.0840
   10     i-C5                  0.0240
   11     n-C5                  0.0220
   12     C6                    0.0320
   13     C7+                   0.0490
   14     Benzene               0.0000
   15     Toluene               0.0000
   16     E-Benzene             0.0000
   17     Xylenes               0.0000
   18     n-C6                  0.0000
   19     224Trimethylp         0.0000

   C7+ Molar Ratio: C7  :     C8  :     C9  :     C10+
                    1.0000    1.0000    1.0000    1.0000

-- Sales Oil ----------------------------------------------------------------------------
Production Rate            : 0.8[bbl/day]
Days of Annual Operation   : 365 [days/year]
API Gravity                : 46.0
Reid Vapor Pressure        : 7.70[psia]
Bulk Temperature           : 80.00[F]

-- Tank and Shell Data ------------------------------------------------------------------
Diameter                   : 6.55[ft]
Shell Height               : 11.90[ft]
Cone Roof Slope            : 0.06
Average Liquid Height      : 2.50[ft]
Vent Pressure Range        : 0.06[psi]
Solar Absorbance           : 0.54

-- Meteorological Data ------------------------------------------------------------------
```

City : Charleston, WV
Ambient Pressure : 14.70[psia]
Ambient Temperature : 70.00[F]
Min Ambient Temperature : 44.00[F]
Max Ambient Temperature : 65.50[F]
Total Solar Insolation : 1123.00[Btu/ft^2*day]

****
* Calculation Results *
****

-- Emission Summary --

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
Total HAPs	0.010	0.002
Total HC	0.440	0.100
VOCs, C2+	0.398	0.091
VOCs, C3+	0.366	0.084

Uncontrolled Recovery Info.

Vapor	21.3600 x1E-3	[MSCFD]
HC Vapor	20.1300 x1E-3	[MSCFD]
GOR	26.21	[SCF/bbl]

-- Emission Composition --

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.002	0.000
2	O2	0.000	0.000
3	CO2	0.022	0.005
4	N2	0.001	0.000
5	C1	0.042	0.010
6	C2	0.032	0.007
7	C3	0.074	0.017
8	i-C4	0.032	0.007
9	n-C4	0.104	0.024
10	i-C5	0.044	0.010
11	n-C5	0.055	0.013
12	C6	0.018	0.004
13	C7	0.018	0.004
14	C8	0.007	0.002
15	C9	0.001	0.000
16	C10+	0.000	0.000
17	Benzene	0.001	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.000	0.000
21	n-C6	0.012	0.003
22	224Trimethylp	0.000	0.000
	Total	0.465	0.106

-- Stream Data --

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0508	0.0349	0.0002	0.6834	0.0136	0.5300
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.2437	0.0907	0.0000	6.3467	0.0001	4.8932
4	N2	28.01	0.0102	0.0005	0.0000	0.3990	0.0001	0.3077
5	C1	16.04	0.9543	0.1475	0.0000	33.1362	0.0001	25.5474
6	C2	30.07	0.6701	0.3531	0.0000	13.3133	0.0001	10.2643
7	C3	44.10	2.1827	1.7648	0.1650	18.8508	7.7283	16.3035
8	i-C4	58.12	1.1269	1.0450	0.4199	4.3934	8.4794	5.3292
9	n-C4	58.12	4.6091	4.4100	2.4201	12.5490	33.8903	17.4366
10	i-C5	72.15	3.1066	3.0997	2.5845	3.3810	14.4418	5.9141
11	n-C5	72.15	5.0558	5.0823	4.5640	4.0000	18.6415	7.3532
12	C6	86.16	4.1726	4.2520	4.3903	1.0044	5.4996	2.0339
13	C7	100.20	10.3655	10.6043	11.4043	0.8388	4.9220	1.7740

14	C8	114.23	10.8426	11.1074	12.1183	0.2806	1.7185	0.6099
15	C9	128.28	5.5127	5.6497	6.1918	0.0497	0.3141	0.1103
16	C10+	166.00	45.9695	47.1217	51.7705	0.0099	0.0646	0.0224
17	Benzene	78.11	0.5685	0.5808	0.6160	0.0778	0.4364	0.1599
18	Toluene	92.13	0.2132	0.2183	0.2375	0.0082	0.0484	0.0174
19	E-Benzene	106.17	0.0711	0.0729	0.0798	0.0009	0.0055	0.0020
20	Xylenes	106.17	0.6802	0.6971	0.7636	0.0075	0.0461	0.0163
21	n-C6	86.18	3.5939	3.6672	3.8386	0.6694	3.7494	1.3748
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		123.89	126.03	131.01	38.64	67.38	45.22
	Stream Mole Ratio		1.0000	0.9755	0.9683	0.0245	0.0073	0.0317
	Heating Value	[BTU/SCF]				2044.13	3737.28	2431.90
	Gas Gravity	[Gas/Air]				1.33	2.33	1.56
	Bubble Pt. @ 100F	[psia]	56.28	19.66	4.78			
	RVP @ 100F	[psia]	126.75	78.89	30.62			
	Spec. Gravity @ 100F		0.800	0.803	0.813			

Attachment O

Monitoring/Recordkeeping/Reporting/Testing Plans

Attachment O
Monitoring, Recordkeeping, Reporting, Testing Plans.

ACP, LLC. will comply all of the monitoring, recordkeeping, reporting, and testing requirements established in the issued permit for the Marts Compressor Station.

Attachment P

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Atlantic Coast Pipeline, LLC. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update for a compressor station operation located in West Milford, Lewis County, West Virginia. The latitude and longitude coordinates are: 39.14190 and -80.47318.

The applicant estimates the increased potential to discharge the following regulated air pollutants on a facility-wide basis will be:

Carbon Monoxide (CO) = 0.08 tpy
Nitrogen Oxides (NO_x) = 0.38 tpy

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 1250, during normal business hours.

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

By: Atlantic Coast Pipeline, LLC.
Leslie Hartz
Vice President Pipeline Construction
5000 Dominion Blvd.
Glen Allen, VA 23060