pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

April 19, 2019

Mr. Mark F. Valori
Vice President
New Jersey Resources Corporation
1415 Wyckoff Road
Wall Township, NJ 07719

Re: Adelphia Gateway, LLC – Marcus Hook Compressor Station
Application No. 23-0225
Plan Approval Issuance
APS ID No. 969188; **AUTH ID No.** 1230881
Lower Chichester Township
Delaware County

Dear Mr. Valori:

Please find enclosed a Department of Environmental Protection's (DEP) Plan Approval to construct, modify, reactivate, or install an air cleaning device on an air contamination source. This Plan Approval contains special conditions which must be fulfilled. Failure to do so violates Section l27.25 of DEP rules and regulations, which may result in enforcement action and denial of an Operating Permit.

A DEP Operating Permit will be issued if (l) the special conditions incorporated within the Plan Approval have all been fulfilled; (2) DEP is satisfied that the project was carried out as proposed in the application, and that the operation of the source(s) and any associated air pollution control equipment conforms with the operational information stated on the application; and (3) the DEP is satisfied that the air contaminant emissions from the source(s) comply with the requirements specified in, or established pursuant to, all applicable DEP rules and regulations.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

If you have any questions concerning this matter, please contact me at the phone number located in the first page footer.

Sincerely,

for Janine Tulloch-Reid, P.E.
Environmental Engineer Manager
Facilities Permitting Section
Air Quality

Enclosure

cc: PADEP, Harrisburg, Division of Permits
Ms. Guo, Permit Reviewer
Ms. Gallagher, EGM
File No. 23-0225
Re (VMC19) 112

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR QUALITY PROGRAM

PLAN APPROVAL

Issue Date: April 19, 2019 Effective Date: April 19, 2019

Expiration Date: October 19, 2020

In accordance with the provisions of the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, and 25 Pa. Code Chapter 127, the Owner, [and Operator if noted] (hereinafter referred to as permittee) identified below is authorized by the Department of Environmental Protection (Department) to construct, install, modify or reactivate the air emission source(s) more fully described in the site inventory list. This Facility is subject to all terms and conditions specified in this plan approval. Nothing in this plan approval relieves the permittee from its obligations to comply with all applicable Federal, State and Local laws and regulations.

The regulatory or statutory authority for each plan approval condition is set forth in brackets. All terms and conditions in this permit are federally enforceable unless otherwise designated as "State-Only" requirements.

Plan Approval No. 23-0225

Federal Tax Id - Plant Code: 82-3224011-2

Owner Information

Name: ADELPHIA GATEWAY, LLC
Mailing Address: 1415 WYCKOFF RD
WALL, NJ 07719

Plant Information

Plant: ADELPHIA GATEWAY/MARCUS HOOK COMPRESSOR STA
Location: 23 Delaware County 23824 Lower Chichester Township
SIC Code: 4923 Trans. & Utilities - Gas Transmission And Distribution

Responsible Official

Name: MARK F. VALORI
Title: VICE PRESIDENT
Phone (732) 938 - 1169

Plan Approval Contact Person

Name: MARK F. VALORI
Title: VICE PRESIDENT
Phone: (732) 938 - 1169

[Signature] James D. Rebarchak

JAMES D. REBARCHAK, SOUTHEAST REGION AIR PROGRAM MANAGER

Plan Approval Description

This plan approval is for the construction, operation, and maintenance of a new natural gas compressor station (with a design throughput of 250 million cubic feet per day) and metering station at an existing facility. The compressor station is intended to increase the pressure of natural gas from an existing pipeline from approximately 640 psig to 840 psig.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHEAST REGIONAL OFFICE

MEMO

TO James D. Rebarchak 4/18/19
Manager, Regional Air Quality Program
Southeastern Regional Office

FROM Jing Y. Guo 4/18/2019
Facilities Permitting Section
Air Quality Program

THROUGH Janine Tulloch-Reid, P.E. JTR 4/18/2019
Manager, Facilities Permitting Section
Air Quality Program

DATE April 18, 2019

RE Plan Approval Technical Review Memo
Application No. 23-0225
Adelphia Pipeline Company, LLC – Marcus Hook Compressor Station
Lower Chichester Township
Delaware County
APS No.: 969188, AUTH No.: 1230881

1. Introduction

On May 16, 2018, Adelphia Pipeline Company, LLC (Adelphia) submitted a Plan Approval application to the Department of Environmental Protection (DEP), for construction and operation of a new Natural Gas Compressor Station - the Marcus Hook Compressor Station (Marcus Hook CS), located at Lower Chichester Township, Delaware County (1111 West Ridge Road, Linwood, PA 19061).

Marcus Hook CS is a natural gas transmission facility, with a Standard Industrial Classification (SIC) Code 4922 and regulated by the Federal Energy Regulatory Commissions (FERC).

The application was received in triplicate, along with copies of compliance review form, general information form, and application fee. The delivery confirmation for the municipal and county notifications was received on May 24, 2018. The application was considered administratively complete on June 5, 2018.

On August 30, 2018, DEP emailed a list of technical deficiencies of the application to Adelphia requesting clarification and additional information regarding this application (See Appendix A -

Technical Deficiencies and Responses). Adelphia's initial responses to DEP's deficiency email was received on September 14, 2018; subsequently, Adelphia provided additional information for this application from October 25, 2018 through January 25, 2019.

Listed below is a summary:

Administrative/Notifications

Application Received:	*May 16, 2018*
Application Fee:	*$1,700 along with Application*
Municipal notification Confirmation:	*May 24,2018*
Administratively Complete:	*June 5, 2018*
Technical Deficiency Email:	*August 30, 2018*
Responses to Tech Deficiency Received:	*September 14, 2018*
Additional Information Received:	*October 25, 2018 - January 25, 2019*
Public Notification:	*November 3, 2018*

2. Project Description

2.1 Project Scope

The proposed Marcus Hook CS will be constructed at the existing industrial complex, near the Adelphia's Delmarva Meter Station (See Appendix B – Site Plan). The facility will compress natural gas from the Marcus Hook interstate pipeline system to be transported downstream along the transmission system. It is designed to receive pipeline quality natural gas from the existing 18" pipeline and to exit the station through two 16" lateral pipelines to various downstream customers.

The proposed facility is designed for 250 million cubic feet per day (mmcf/d) throughput capacity (daily maximum: 375 mmcf/d) with provisions for expanding to a 350 mmcf/d (daily average throughput capacity) by installing an additional compressor (as shown in Appendix B – Plot Plan), or constructing a new midpoint compressor station.

The process flow for Marcus Hook CS is as follows:

1) Pipeline quality natural gas enters the station and flows through a suction filter separator and into the station suction piping;
2) Three (3) units of reciprocating compressors compress natural gas from 640 psig to 840 psig; and
3) The compressed natural gas flows into the discharge header, continues through a coalescing filter and exits the station into two 16" laterals that delivers natural gas to various downstream customers.

The application indicates that at Marcus Hook CS:

- There are no cooling process and/or equipment installed as cooling for natural gas because this is not required.
- There is no glycol dehydration unit as part of this project. The glycol is exclusively used with an engine cooling system.

- The pneumatic controllers are air driven. Therefore, there are no emissions associated with their operation.

2.2 Source Aggregation

According to the Department's Guidance for Performing Single Stationary Source Determinations for Oil and Gas Industries (Docket 270-0810-006), the source aggregation analysis is based on the following three factors to determine whether emission sources should be aggregated:

(1) the sources all belong to the same industrial grouping;
(2) the activities are located on one or more contiguous or adjacent properties; and
(3) the activities are under common control.

The proposed Marcus Hook CS is sited within an existing industrial complex. However, Adelphia does not own or control any additional sources that are directly adjacent to Marcus Hook CS. The nearest source controlled by Adelphia is a meter station (the Delmarva Meter Station) located almost exactly a quarter mile away in Delaware. As a result of the above-described analysis, it is determined that the proposed Marcus Hook CS is a single facility, and shall not be aggregated with any other source.

2.3 Program Coordination

This project is not in coordination with any other Department programs.

3. Emission Sources and Regulations

Marcus Hood CS is designed to have the following equipment and processes.

3.1 Compressors and Compressor Engines (Source IDs 101 – 103)

Adelphia will install three (3) identical units of reciprocating compressors, as indicated below:

Rated capacity:	125 mmcf/d each
operating range:	640 psig to 840 psig
proposed operating hours:	8760 hours per year (hr/yr) for each unit

Each compressor is powered by a spark ignition (SI) Engine (3 identical units):

manufacturer/model:	Caterpillar G3606, stationary spark ignition
rated capacity:	1,875 bhp each, 4-stroke, lean burn
fuel consumption:	natural gas, 13,955 standard cubic feet per hour (SCF/hr)
proposed operating hours:	8760 hr/yr for each engine
engine emission control:	each engine with an oxidation catalytical unit
post-control emissions:	meeting BAT standards [Section C1(c)(i), GP5]

Adelphia uses oxidation catalytical units (Source IDs C101 – C103) for compressor engine emission control:

manufacturer/model:	Emit Technologies, Inc., Model No. RT-3615-Z (or equivalent), 3 units
flowrate capacity:	11,972 cfm
inlet temperature of gas flow:	822 °F
pressure drop across the unit:	less than 9.8 inches of water
emission performance guarantee:	meeting the BAT standards

40 CFR Part 60 Subpart OOOOa — *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015.*

The reciprocating compressors at this facility (a natural gas compressor station) are subject to the applicable requirements of this subpart in accordance with §60.5365a(c). **The facility elects the option of "replacing the reciprocating compressor rod packing" as specified in 40 CFR §60.5385a(a)(1) or (2), to demonstrate their compliance status with the GHG and VOC standards of this subpart.** The respective requirements for the compressor rod packing pursuant to 40 CFR Part 60 Subpart OOOOa have been incorporated.

40 CFR Part 60 Subpart JJJJ—Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

The compressor engines, stationary spark ignition (SI) internal combustion engines (ICE), **are** subject to the applicable requirements of this subpart in accordance with §60.4230(a).

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

The compressor SI engines are subject to 40 CFR Part 63 Subpart ZZZZ (as new area sources). **The facility elects to fulfill the applicable Subpart ZZZZ requirements by complying with the standards of 40 CFR Part 60 Subpart JJJJ in accordance with 40 CFR §63.6590(c).**

Best Available Technology (BAT) Standards
For the compressor SI engines, the Department BAT standards as specified in Section C Condition 1 (c)(i), of DEP's General Plan Approval and/or General Operating Permit BAQ-GPA/GP-5 (GP5), for lean burn SI engines constructed after August 8, 2018 (500 hp < engine < 2370 hp), were used as baseline for BAT standards. These standards are shown below:

CO (Carbon Monoxide):	0.25 g/bhp-hr
NOx (Nitrogen Oxides):	0.5 g/bhp-hr
VOCs (NMNEHC as propane, excluding HCHO):	0.25 g/bhp-hr
HCHO (Formaldehyde):	0.05 g/bhp-hr

According to the manufacturer's specifications for the oxidation catalytical units (Source IDs C101 – C103), post-control emissions of the compressor engines **meet** the above BAT standards. In addition, Adelphia is required to conduct post-construction testing for the compressor engines to ensure that the emission standards are being met.

25 Pa. Code §§ 129.203 - 129.205 (Additional NOx Requirements)
The compressor engines are subject to the applicable requirements of 25 Pa. Code §§129.203 through 129.205, as the engines are rated at greater than 1,000 horsepower and located in Delaware County.

3.2 Pigging Operations (Source ID 300)

Purpose of the pigging operations at Marcus Hook CS is to:

- clean the pipeline by sweeping any liquid out of the line to improve overall flow efficiency; and
- conduct in-line inspections of natural gas pipelines.

This is accomplished by inserting a pig into a "pig launcher"— an oversized section in the pipeline, reducing to the normal diameter. The launching station is then closed and the pressure-driven flow of the natural gas in the pipeline is used to push the pig along down the pipe until it reaches the receiving trap — the "pig receiver ".

The application indicates that Marcus Hook CS conducts the pigging operations based on the following schedule:

- cleaning the pipeline, annually.
- conducting inspections, once every 5-7 years.

The estimated gas volume from the pigging operations are:

12,000 scf per year for Marcus Hook CS

BAT Standards
There are no requirements in 40 CFR Part 60 Subpart OOOOa established for the pigging operations. Therefore, the Department BAT standards for pigging operations as specified in Section K of GP5 were established for Marcus Hook Pigging Operations. The conditions are as follows:

The emissions from pigging operations shall not exceed the following limits, as a 12-month rolling sum:

Methane:	200 tons/year, or
VOC:	2.7 tons/yr or
A single HAP:	0.5 tons/yr, or
Combined total HAPs:	1.0 tons/yr

3.3 Fugitive Emissions Components (Source ID 400)

Fugitive emissions components at Marcus Hook CS are any component that has the potential to emit fugitive emissions of methane or VOC as specified in 40 CFR §60.5430a, including but not limited to:

- compressor rod packing and seal leaking,
- engine crankcase,
- natural gas pipeline valves, connectors, flanges,
- pressure relief devices, emergency shutdown, and
- any maintenance activities.

The permittee shall comply with the applicable monitoring, recordkeeping, reporting, and work practice standards as specified in 40 CFR Part 60 Subpart OOOOa and the BAT requirements as specified in Section G of GP5.

3.4 Cummins Emergency Generator SI Engine (Source ID 600)

A SI engine (rated 701 bhp) for Cummins GTA Emergency Generator Set is installed as "an exempt engine" under this plan approval according to the DEP document, 275-2101-003 / August 8, 2018:

> *"25 Pa. §127.14(a)(8) Item 6: Internal combustion engines regardless of size, with combined NOx emissions less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season and 6.6 tpy on a 12-month rolling basis for all exempt engines at the site."*

The above exempt limitations are placed in the Plan Approval as well as the applicable requirements of 40 CFR Part 60 Subpart JJJJ and Part 63 Subpart ZZZZ. **Adelphia elects to fulfill the applicable Subpart ZZZZ requirements by complying the Subpart JJJJ standards**. In addition, testing is required for this engine to ensure that the emission standards are being met.

manufacturer/model:	Cummins GTA28 generator set, 523 kW
generator engine:	4-stroke, rich-burn engine, Caterpillar G3412C
rated capacity:	701 bhp (670 hp)
engine fuel:	natural gas, 5,699 SCF/hr
operating hours:	500 hr/yr proposed by Adelphia
control device:	a non-selective catalytical reduction unit
post-control emissions:	meeting NSPS Subpart JJJJ emission standards

3.5 Insignificant Emission Sources

DEP has determined that emissions from the following sources are of insignificant size and do not require additional limitations.

3.5.1 Produced Fluids Tank

Capacity:	1,000 gallons
Vapor pressure of liquid of the tank:	<1.5 psia
Total throughput:	24,000 gallons/year

3.5.2 Engine Oil Tank

Capacity:	500 gallons
Vapor pressure of liquid of the tank:	negligible
Total throughput:	6,000 gallons/year

3.5.3 Triethylene Glycol (TEG) Tank

Capacity:	500 gallons
Vapor pressure of liquid of the tank:	negligible
Total throughput:	6,000 gallons/year

These vessels **are not** subject to the regulations and requirements as identified below:

40 CFR Part 60 Subpart OOOOa
The potential-to-emit (PTE) VOC emissions from each storage vessel are significantly less than 6 tons per year. In accordance with §60.5395a(e), all storage vessels at Marcus Hook CS are not subject to this subpart.

40 CFR Part 60 Subparts K and Ka, and Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

- 40 CFR Part 60 Subpart K and Ka apply to storage tanks constructed, reconstructed, or modified prior to 1978 and 1984, respectively. All storage vessels at Marcus Hook CS are constructed after these dates; therefore, the requirements of Subparts K and Ka do not apply.

- 40 CFR Part 60 Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m3 (~19,813 gallons). All storage vessels at Marcus Hook CS do not have a capacity greater than 75 m^3. Therefore, Subpart Kb does not apply.

25 Pa. Code §129.56: Storage tanks greater than 40,000 gallons capacity containing VOCs.
25 Pa. Code §129.57: Storage tanks less than 40,000 gallons capacity containing VOCs.

- These storage vessels are not subject to 25 Pa. Code §129.56 as the capacity of each vessels is less than 40,000 gallons.

- These storage vessels are not subject to 25 Pa. Code §129.57 as the provisions of this section apply to above ground stationary storage tanks with a capacity equal to or greater than 2,000 gallons.

BAT Standards
Based on the Plan Approval application, the combined PTE VOC emissions from all storage vessels at Marcus Hook CS are significantly less than 2.7 tons per year. Thus, these storage vessels are not subject to the standards in Section E of GP5.

In accordance with the DEP document, 275-2101-003 / August 8, 2018, these storage vessels are exempt from the Plan Approval requirements:

1. *25 Pa. §127.14(a)(8) Item 15: storage vessels for VOC [which do not contain HAP] which have capacities less than 10, 000gallons...., and*
2. *25 Pa. §127.14(a)(8) Item 31: Sources of uncontrolled VOC emissions not addressed elsewhere in this exemption listing modified or newly added, such that emission increases are less than 2.7 tpy.*

Marcus Hook CS is **not** subject to the following regulations, as indicated below:

40 CFR Part 63 Subpart HH — National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

Subpart HH – NESHAP for natural gas production facilities applies to glycol dehydration units at natural gas production facilities that are major or area sources of HAP emissions prior to custody transfer to the transmission pipeline. The proposed project would be located after custody transfer. Therefore, the proposed Marcus Hook CS would not be a natural gas production facility as defined by the rule, and this subpart would not be applicable.

40 CFR Part 63 Subpart HHH – Natural Gas Transmission and Storage Facilities

This subpart applies to glycol dehydration units at natural gas transmission and storage facilities that are major sources of HAP emissions. Marcus Hook CS is an area source of HAP emissions; therefore, Marcus Hook CS is not subject to Subpart HHH.

40 CFR Part 98 — Mandatory Greenhouse Gas Reporting

The facility's Greenhouse Gases (GHG) potential-to-emit is 34,000 tons per year carbon dioxide equivalent (CO_2e), less than the GHG Title V threshold level of 75,000 ton/yr

CO_2e. Furthermore, the facility is not listed as a source category in Table A-3 (40 CFR § 98.2(a)(1)), Table A-4 (40 CFR § 98.2(a)(2)) or Table A-5 (40 CFR § 98.2(a)(4)) of 40 CFR Part 98 Subpart A. Therefore, Marcus Hook CS is not a Major facility for GHG emissions and is not subject to the standards of 40 CFR Part 98.

4. Emission Limits

The potential-to-emit (PTE) emissions calculations for this facility are shown below.

Table 4.1 PTE Emissions from Compressor Engine and Emergency Engine Operations

Pollutant	3 Compressor Engines[1] Source IDs 101 - 103		Emergency Engine[2] Source ID 600	
	Emission factors (g/bhp-hr)	Emissions (ton/yr)	Emission factors (g/bhp-hr)	Emissions (ton/yr)
NOx	0.30	16.30	2.0	0.77
VOC[3]	0.16	10.86	1.0	0.43
CO	0.17	9.47	4.0	1.54
HCHO	0.04	2.16	0.02	0.01

1): Operating hour: 8760 hr/yr for each compressor SI engine.
2): Operating hour: 500 hr/yr.
3) VOC includes HCHO.

Table 4.2 Facility-wide PTE Emissions (tons/yr) [1]

Pollutant	Leaks & Fugitives Emissions [2]	Compressor Engines Operation	Compressor Engine Crankcase	Emergency Engine Operation	Combined Total Emissions
NOx	-	16.30	0.77	0.77	**17.07**
VOC[3]	6.83	10.86	4.46	0.42	**22.57**
CO	-	9.47	1.54	1.54	**11.01**
HCHO	-	2.16	0.01	0.01	**2.17**

1): This emission estimate is based on the facility design capacity, manufacturer's emission factors and/or specifications, AP-42 emission factors (Fifth Edition), and facility operating parameters.
2): The emissions from all *fugitive emissions components* as defined in 40 CFR §60.5430a of Subpart OOOOa and GP5 (see Appendix C for detailed calculations).
3): VOC includes HCHO.

DEP has established the following:

a. facility-wide emission limits from all emitting sources, calculated as a 12-month rolling sum:

Nitric Oxides (NOx):	24.9 tons per year
Volatile Organic Compounds (VOCs):	24.9 tons per year
Individual Hazardous Air Pollutant (HAP):	9.9 tons per year
Total HAPs:	24.9 tons per year

Tons per year = Tons per 12-month rolling period, calculated monthly.
HCHO = Formaldehyde.
NMNEHCs = Non-methane, non-ethane hydrocarbons, as propane, excluding HCHO.

b. the combined emission limits for the three (3) compressor engines:

Pollutant	ton/yr (as a 12-month rolling sum)
Carbon Monoxide (CO):	9.47
Formaldehyde (HCHO):	2.16
Nitrogen Oxides (NOx):	16.30
NMNEHCs (non-methane hydrocarbons):	8.69

Marcus Hook CS is a State-only (not a Major) facility as their NOx and VOC emissions are below the threshold level of 25 tons per year, respectively. Potential-to-emit HAP emissions are also below the threshold levels, 10 ton/yr for any single HAP emissions and 25 ton/yr for combined total HAP emissions. Thus, Marcus Hook CS is an area source for HAP emissions.

5 Additional Requirements and Analysis

5.1 New Source Review (NSR)

The VOC and NOx emissions from the proposed project at Marcus Hook CS are below the threshold of 25 tons respectively. Therefore, Marcus Hook CS is not considered a major facility, and NSR does not apply.

5.2 Best Available Technology (BAT) Determination

BAT is a pollutant specific determination and each plan approval application is required to demonstrate that the emissions from the new source will be the minimum attainable through the use of a BAT analysis as per 25 Pa. Code §127.12(a)(5). In accordance with the Department's definition of BAT, Adelphia has conducted such an analysis and researched the following databases: EPA's NSR website, RBLC database, technical books and articles, vendor information, and various state and federal regulations and documents.

5.3 Testing

Testing is required for the compressor engines and the emergency engine (Source ID 600) to ensure that the emission standards are being met.

5.4 Monitoring, recordkeeping, and implementation

In accordance with the requirements of 40 CFR § 60.18, sufficient monitoring and recordkeeping is required to be retained for a minimum of five (5) years.

6. Recommendation

I recommend issuing Plan Approval, No. 23-0225, to Adelphia – the Marcus Hook Compressor Station, located at Lower Chichester Township, Delaware County, based on the above conditions.

7. Listing of Appendices

Appendix A – Technical Deficiencies and Responses

A1 – Identified Technical Deficiencies
A2 – Revised Application Form
A3 – Revised Emission Calculations
A4 – General Responses from Adelphia

Appendix B – Diagrams

B1 – Site Plan
B2 – Plot Plan

Appendix C – Leaks and Fugitive Emissions Calculations

Marcus Hook Compressor Station

Draft Plan Approval No. 23-0225

Appendix A - Technical Deficiencies and Responses

A1 – Identified Technical Deficiencies

A2 – Revised Application Form

A3 – Revised Emission Calculations

A4 – General Responses from Adelphia

Guo, Jing

From: Smith, David S
Sent: Friday, August 31, 2018 9:27 AM
To: mvalori@NJResources.com
Cc: idonaldson@trinityconsultants.com; Jonathan Hess; awesthoven@njresources.com; jperry@njresources.com; Rebarchak, James; Tulloch-Reid, Janine; Guo, Jing; Mountain, Shawn; Mclemore, Kevin
Subject: RE: Technical Deficiencies for Plan Approval Applications for Adelphia Pipeline Co., LLC—Marcus Hook (23-0225) & Quakertown (09-0242)
Attachments: EPA Compliance Guide for 40 C.F.R. Part 60, Subpart OOOOa.pdf; Comp of GP-5 and EPA OOOOa Reqs.pdf; EPA Doc Reducing CH4 Emiss from Compressor Rod Packing Sys.pdf

My apologies, I did not include the referenced attachments in the original e-mail....

David S. Smith, E.I.T. | Air Quality Engineering Specialist
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5064 | Fax: 484.250.5921
www.dep.pa.gov

From: Smith, David S
Sent: Thursday, August 30, 2018 1:52 PM
To: 'mvalori@NJResources.com' <mvalori@NJResources.com>
Cc: 'idonaldson@trinityconsultants.com' <idonaldson@trinityconsultants.com>; 'Jonathan Hess' <Jonathan.Hess@nv5.com>; 'awesthoven@njresources.com' <awesthoven@njresources.com>; 'jperry@njresources.com' <jperry@njresources.com>; Rebarchak, James <jrebarchak@pa.gov>; Tulloch-Reid, Janine <jtullochre@pa.gov>; Guo, Jing <jguo@pa.gov>; Mountain, Shawn <smountain@pa.gov>; Mclemore, Kevin <kmclemore@pa.gov>
Subject: Technical Deficiencies for Plan Approval Applications for Adelphia Pipeline Co., LLC—Marcus Hook (23-0225) & Quakertown (09-0242)

Dear Mr. Valori,

On May 16, 2018, the Department of Environmental Protection (DEP) received Plan Approval applications and associated documents for construction and operation of a natural gas compressor station at Adelphia Pipeline Company, LLC's (Adelphia's) Marcus Hook facility **[Plan Approval No. 23-0225, APS ID 969188, Auth ID 1230881]**, and construction and/or operation of a natural gas compressor station and metering stations at Adelphia's Quakertown facility **[Plan Approval No. 09-0242, APS ID 969182, Auth ID 1230871]** (hereinafter referred to as "the facilities"). DEP has reviewed these submittals and determined that significant technical deficiencies exist:

A. Emergency Generator Engine (Narrative: Sections 2, 2.2, 3.2.2.2, and 4.2, Appendix B, Table B-2, and Appendix C; Application: Section C, Item 10)

1. Sections 2.2 and 3.2.2.2, and Appendix B, Table B-2, indicate that the proposed emergency generator engine is a rich-burn engine rated at 670 *bhp*. However, based on the manufacturer's specifications, presented in Appendix C, the engine is rated at 563 *bkW*, which equates to 755 *bhp*. Also, based on the percent oxygen in the exhaust, the engine appears to be a lean-burn engine. Please confirm the type and size of the engine, and revise the affected pages of the submittal.

2. The manufacturer's specifications for the emergency generator engine indicate the following emissions data:

   Nitrogen oxides (NO_x): 2.0 *g/bhp-hr*
   Carbon monoxide (CO): 1.8 *g/bhp-hr*
   Non-methane hydrocarbons (NMHCs): 0.8 *g/bhp-hr*

In addition, Section 3.2.2.2 indicates that the engine would be equipped with a non-selective catalytic reduction (NSCR) catalyst. While Section 3.2.2.2, Table 3-2, indicates the same emissions data as the manufacturer's specifications after the application of NSCR, the manufacturer's specifications make no mention of NSCR or any other control technique. Please confirm whether the emissions levels indicated in the manufacturer's specifications are before or after the application of NSCR.

3. The above notwithstanding, Section 3.2.2.2, Table 3-2, is correct that the emissions data indicated in the manufacturer's specifications demonstrate compliance with the applicable emission standards (i.e., for an emergency engine rated at equal to or greater than 130 *bhp*) indicated in 40 C.F.R. Subpart JJJJ (specifically § 60.4233(e)). However, Section 4.2 incorrectly states that "[t]hese rates are equivalent to [DEP's] [best available technology] (BAT) level for ... engines under [General Plan Approval and/or General Operating Permit BAQ-GPA/GP5] (GP-5)." Please be aware that, since the date that Adelphia submitted the Plan Approval application, DEP has revised the GP-5, including the BAT compliance requirements and emission standards. [Note: Pursuant to 25 Pa. Code § 127.1, [n]ew sources shall control the emission of air pollutants to the maximum extent, consistent with [BAT] as determined by [DEP] as of the date of issuance of the plan approval for the new source. Therefore, the facility is subject to all applicable BAT compliance requirements and emission standards specified in the GP-5.] For engines constructed and authorized to operate after August 8, 2018, the applicable BAT emission standards (for a lean-burn engine rated at greater than 500 *bhp* and less than 2,370 *bhp*), as indicated in Condition 1(c)(i), Section C, of the GP-5, are as follows:

   NO_x: 0.50 *g/bhp-hr*
   CO: 0.25 *g/bhp-hr*
   Non-methane, non-ethane hydrocarbons (NMNEHCs): 0.25 *g/bhp-hr* (as propane)
   Formaldehyde (HCHO): 0.05 *g/bhp-hr*

   Pursuant to 25 Pa. Code § 127.12(a)(5), DEP requests that Adelphia conduct a BAT analysis for the emergency generator engine. The format of the BAT analysis may follow that of a "top-down" Best Available Control Technology (BACT) analysis, as follows:

   a. Step 1: Identify Available Control Technologies

   b. Step 2: Eliminate Technically Infeasible Operation

   c. Step 3: Rank Remaining Control Technologies by Control Effectiveness

   d. Step 4: Evaluate Economic, Environmental, and Energy Impacts of Technically Feasible Control Technologies

   e. Step 5: Identify BAT

   Please ensure that the BAT analysis addresses HCHO emissions from the emergency generator engine, which are not addressed in the manufacturer's specifications.

4. Please specify the following for the emergency generator engine:

   a. The life of the catalyst, as requested in Section C, Item 10, of the Plan Approval application.

   b. The stack diameter, height, elevation, and distance to nearest property line, exhaust moisture percentage, and location of sampling ports, as requested in Section F, Item 2, of the Plan Approval application.

B. Compressor Engines and Associated Oxidation Catalyst Units (Narrative: Sections 3.2.2.2 and 4.1, Appendix B, Table B-1, Appendix C; Application: Section C, Item 11, Section E, Section F, Item 2)

1. Section 3.2.2.2, Table 3-3, is correct that the post-catalyst emissions data indicated in the manufacturer's specifications for the oxidation catalyst units, presented in Appendix C, demonstrate compliance with the applicable emission standards (i.e., for non-emergency engines rated at equal to or greater than 1,350 *bhp*) indicated in 40 C.F.R. Subpart JJJJ (specifically § 60.4233(e)). However, the uncontrolled emissions data indicated for the compressor engines in the manufacturer's specifications for the oxidation catalyst units differs from that indicated in the manufacturer's specifications for the compressor engines, also presented in Appendix C, themselves (at 100% load), as follows:

Pollutant	Uncontrolled Emissions Data from Manufacturer Specifications for:	
	Oxidation Catalyst	Compressor Engines
NO_x	0.50 *g/bhp-hr*	0.30 *g/bhp-hr*
CO	2.20 *g/bhp-hr*	2.59 *g/bhp-hr*
NMNEHCs	0.29 *g/bhp-hr*	0.41 *g/bhp-hr*
HCHO	0.20 *g/bhp-hr*	0.21 *g/bhp-hr*

DEP is uncertain why the uncontrolled NO_x emissions data indicated in the manufacturer's specifications for the oxidation catalyst units is higher than in those for the compressor engines. Nonetheless, since the oxidation catalyst does not provide any NO_x emission reduction, DEP will consider the NO_x emissions data indicated in the manufacturer's specifications for the compressor engines as representative. However, since the uncontrolled CO, NMNEHC, and HCHO emissions data indicated in the manufacturer's specifications for the compressor engines is higher than in those for the oxidation catalyst units, DEP must infer that the corresponding post-catalyst emissions data is also higher.

Moreover, please note that the compressor engines are subject to the same BAT emission standards as indicated for the emergency generator engine in deficiency A.3., above. While the post-catalyst emissions data indicated in the manufacturer's specifications for the oxidation catalyst units also demonstrates compliance with the BAT emission standards, this is not clear when projecting the post-catalyst emissions data higher. Please confirm the post-catalyst emissions data, and revise the affected page(s) of the submittal.

Lastly, DEP requests that Adelphia revise/expand upon the BAT analysis presented in Section 4.1. As indicated for the emergency generator engine in deficiency A.3., above, the format of the BAT analysis may follow that of a "top-down" BACT analysis.

2. Please specify the following for the oxidation catalyst units:

   a. The differential pressure range across the catalytic bed, as requested in Section C, Item 11, of the Plan Approval application.

   b. The outlet flow rate and temperature, as requested in Section C, Item 11, of the Plan Approval application.

   c. Whether Adelphia intends to install devices to monitor the differential pressure, inlet and outlet flow rate, and inlet and outlet temperature, and the corresponding monitoring and recordkeeping frequency, as referenced in Section E of the Plan Approval application.

3. Please specify the following for the compressor engines:

   a. Whether Adelphia intends to install hour meters on each engine to monitor the operating hours, and the corresponding monitoring and recordkeeping frequency, as referenced in Section E of the Plan Approval application.

   b. Whether Adelphia intends to install natural gas meters on each engine, or a combined fuel meter, to monitor the natural gas consumption by the engines, and the corresponding monitoring and recordkeeping frequency, as referenced in Section E of the Plan Approval application.

   c. The stack diameter, height, elevation, and distance to nearest property line, exhaust moisture percentage, and location of sampling ports, as requested in Section F, Item 2, of the Plan Approval application.

C. Pneumatic Controllers (Narrative: Section 3.2.2.4)

As indicated in Section 3.2.2.4, all pneumatic controllers Adelphia intends to install at the facility will either be intermittent or have a bleed rate of less than 6 *scfh*. Please specify the quantity of each type of pneumatic controller, and provide calculations for the potential volatile organic compound (VOC), hazardous air pollutant (HAP), and greenhouse gas (GHG) emissions from the pneumatic controllers (in a similar manner to those presented in Appendix B, Tables B-8 and B-10, of Adelphia's Plan Approval application (No. 09-0242) for the compressor station and meter stations at its Quakertown facility), as these were omitted from the submittal.

In addition, Section 3.2.2.4 states that the pneumatic controllers intended to be installed at the facility "would not be subject to the requirements of [40 C.F.R. Part 60,] Subpart OOOOa." This statement is not entirely correct. While intermittent pneumatic controllers are not subject to the provisions 40 C.F.R. Part 60, Subpart OOOOa, please be aware that all continuous bleed natural gas-driven pneumatic controllers are subject to the applicable provisions of the regulation, not only those with a bleed rate greater than 6 *scfh*.[1] To this point, 40 C.F.R. § 60.5390a(c)(1) specifies that "[e]ach pneumatic controller affected facility at a location other than at a natural gas processing plant must have a bleed rate less than or equal to 6 [*scfh*]," which does not make sense if the term "pneumatic controller affected facility" only applies to units with a bleed rate greater than 6 *scfh*. For each different model of continuous bleed natural gas-driven pneumatic controllers intended to be installed at the facility (if any), DEP requests that Adelphia submit the manufacturer's specifications for the controller indicating a bleed rate of less than or equal to 6 *scfh*.

[1] See, for example, Figure 6-1 of the U.S. Environmental Protection Agency's (EPA's) "Small Entity Compliance Guide for Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources 40 C.F.R. Part 60, Subpart OOOOa" (hereinafter referred to as "the compliance guide;" see first attachment), or the "Comparison of Pennsylvania Requirements, EPA Rules, and CSSD Requirements for Methane & VOC Emission Reduction for the Oil & Gas Industry, Effective August 8, 2018" compiled by DEP (see second attachment).

D. Fugitive Emissions Sources (Narrative: Sections 3.2.2.4, 4.4, and 5, and Appendix B, Table B-5)

1. As indicated in Section 3.2.2.4, Adelphia intends to comply with the timeframes for rod packing replacement specified in 40 C.F.R. § 60.5385a(a)(1) or (2). DEP understands this, and the inclusion of calculations for rod packing emissions in Appendix B, Table B-5, to mean that Adelphia does not intend to employ an emissions collection system to collect and control the rod packing emissions. Please confirm. Regarding the calculations themselves, based on information contained in an EPA document, entitled "Reducing Methane Emissions from Compressor Rod Packing Systems" (see third attachment), the rod packing leak rate does not appear to account for wear over time on the packing rings and piston rod. Please specify how the rod packing leak rate will be monitored (i.e., the type of monitoring equipment to be used and the frequency of monitoring) to ensure that it does not increase significantly from the estimated leak rate, and confirm whether Adelphia intends to replace the packing rings (and piston rod, if necessary) at an earlier timeframe than required in 40 C.F.R. § 60.5385a(a)(1) or (2) if the observed leak rate increases significantly from the estimated leak rate.

2. As indicated in Section 3.2.2.4, the fugitive emissions components of the proposed compressor station are subject to 40 C.F.R. Part 60, Subpart OOOOa, and Adelphia intends to conduct the monitoring surveys required under 40 C.F.R. § 60.5397a on a semi-annual basis. Please be aware that, pursuant to 40 C.F.R. § 60.5397a(g)(2), and in accordance with Condition 1(b)(ii), Section G, of the GP-5, monitoring surveys are required to be conducted on a quarterly basis. Therefore, DEP requests that you revise the affected page of the submittal to indicate the correct frequency for conducting the monitoring surveys.

3. There is a discrepancy between the emissions values indicated in Appendix B, Table B-5, under the headings "Engine Crankcase Emissions" and "Engine Crankcase Exhaust Composition." Please resolve. In addition, please provide the basis for the engine crankcase exhaust composition values (in units of *lbs/mmscf*) indicated under the latter heading.

4. Please provide the basis for the total volume of natural gas emitted from the station ESD venting, pigging and pipeline blowdowns, and reciprocating compressors, as indicated in Appendix B, Table B-5. Please also specify the intended pigging frequency.

5. In accordance with Condition 1(a), Section K, of the GP-5, Adelphia is required to employ best management practices for the pigging operations at the facility, and specify the appropriate best management practices in the Plan Approval application. Please provide this information. [Note: Based on the calculations for pigging and pipeline blowdown emissions in Appendix B, Table B-5, the pigging operations do not figure to exceed the emission rates specified in Condition 1(b), Section K, of the GP-5, such that Adelphia would be required to control the emissions by at least 95%. Please be advised that, if any of these emission rates are exceeded, Adelphia would be subject to this requirement.]

E. Produced Fluids, Engine Oil, and Triethylene Glycol (TEG) Tanks (Application: Section B, Item 4)

Please specify the following for the tanks, as requested in Section B, Item 4, of the Plan Approval application:

1. The maximum pressure of the produced fluids and engine oil tanks.

2. The type of pressure relief device for each of the tanks.

F. Glycol Dehydration Units

Please confirm (and detail) whether the proposed installation of the TEG tank at the facility is associated with a glycol dehydration unit(s), an aftercooler(s) and sealed coolant system for the compressor stations, or another operation.

If the TEG tank is associated with a glycol dehydration unit(s), please be aware that Conditions 1–2, Section B, of the GP-5, include corresponding BAT compliance and recordkeeping requirements, respectively. At that point, DEP would request that you provide the following information:

1. The anticipated natural gas throughput rate for the facility.

2. Calculations of the (pre-control) potential VOC, HAP (including benzene, toluene, ethylbenzene, and xylene [BTEX]), and GHG emissions from the glycol dehydration units.

3. A calculation of the optimum or alternative glycol circulation rate (if currently known).

4. A demonstration of how the glycol dehydration unit(s) satisfy the BAT compliance requirements. If an air cleaning device is required based on the emission rate thresholds specified in Condition 1(c), Section B, of the GP-5, please provide the following information:

    a. The type of air cleaning device proposed to be installed.

    b. Calculations of the post-control potential VOC, HAP (including BTEX), and GHG emissions from the glycol dehydration units.

G. Site-Specific Natural Gas Analysis (Narrative: Appendix B, Table B-9 [Marcus Hook]/Table B-14 [Quakertown])

Please provide the hydrogen sulfide (H_2S) or sulfur content, moisture content, and condensable compound content of the natural gas.

H. Title V & New Source Review (NSR) Requirements (Narrative: Sections 3.2 and 3.3, and Appendix B, Tables B-7 and B-8 [Marcus Hook]/Tables B-12 and B-13 [Quakertown]; Application; Section D)

Based on the potential VOC emissions from the facility, as calculated in Appendix B, Tables B-7 and B-8 (Marcus Hook)/Tables B-12 and B-13 (Quakertown), approaching the major facility and NSR threshold of 25 *tons/yr*, and the deficiencies discussed in A.1., B.1., C., D.1. and 3., and F, above, DEP has significant concerns that the potential VOC emissions from the project/facility may exceed 25 *tons/yr*. DEP requests that Adelphia recalculate the potential VOC emissions from the project/facility and, if necessary, propose any enforceable operational restrictions necessary to maintain the potential VOC emissions at less than 25 *tons/yr*.

Unless Adelphia maintains the potential VOC emissions from the facility at less than 25 *tons/yr*, the project would be subject to NSR and Title V requirements. In addition to addressing the deficiencies indicated in, and providing the additional information requested in, this e-mail, such a confirmation would require Adelphia to submit a new Plan Approval application and fee, as well as to complete a NSR analysis under Section D, of the application, and an Addendum A form(s) under Section E, of the application.

I. Additional Information

DEP requests that you provide the following additional information for the facility:

1. A detailed description of the Marcus Hook natural gas compressor station project, including the design natural gas throughput rate and anticipated inlet and outlet natural gas pressure.

2. A detailed site layout of all equipment proposed to be installed as part of the Marcus Hook natural gas compressor station project, including, but not limited to: compressors, the emergency generator, storage tanks, each pig chamber, and piping. Please label the respective equipment for easy discernment.

3. Detailed process and control diagrams, including, but not limited to, all proposed instrumentation, pneumatic controllers, and valves.

4. A maintenance plan and schedule for the various equipment at the facility.

The above requests are made in accordance with 25 Pa. Code § 127.12(a)(2), (4), and (5), and are produced under the responsible charge of Ms. Janine Tulloch-Reid, P.E. In accordance with DEP's Permit Review Process Policy, please submit the requested information by **September 14, 2018**; otherwise, DEP will send a technical deficiency letter. Should you have any questions regarding the identified deficiencies, please contact me to discuss your concerns or to schedule a meeting.

If you believe the stated deficiencies are not significant, you have the option of asking DEP to make a decision based on the information you have already made available. If you choose this option, you should justify how your current submission satisfies the deficiencies noted above.

If you have any questions concerning this matter, please contact Ms. Tulloch-Reid at 484.250.5920, and refer to Plan Approval application nos. 23-0225 and 09-0242.

Sincerely,

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