

**State Air Pollution Control Board Meeting
to Consider an Air Permit for the Buckingham Compressor Station**

Meeting Location

Richmond Convention Center, Richmond, Virginia 23219. The board meeting will be held in **Exhibit Hall B - enter on 5th Street between Leigh and Marshall Streets**. Location information available at: <http://www.richmondcenter.com/>

Registration and Doors Open to the Public: 8:30 a.m. on November 8 and 9, 2018

Meeting Convenes: 9:30 a.m. on November 8 and 9, 2018

Board Meeting

- No outside food or drink is allowed at the Richmond Convention Center.
- No signs are allowed in the Richmond Convention Center.
- No signs or backpacks are allowed in the board meeting.
- Tables may not be set up and written materials by other groups may not be distributed outside the board's meeting rooms in the Richmond Convention Center.
- No tobacco, smoking (including e-cigarettes), alcohol, fireworks, pyrotechnics, weapons, or any substance/item controlled by law are allowed in the Richmond Convention Center.
- No firearms are allowed in the Richmond Convention Center except for firearms carried by sworn law-enforcement officers in the performance of their duties or as permitted by law or open and concealed carry in public areas as permitted by law.
- No firearms are allowed in the board's meeting rooms except for firearms carried by law-enforcement officers or authorized security personnel.
- No animals are allowed except for ADA service animals.
- Attendees shall not block or gather in exits, doors, or aisles.
- All attendees are asked to be respectful of all speakers and are asked not to speak out during other speakers' comments.
- Attendees are not entitled to be disorderly or disrupt the meeting from proceeding in an orderly, efficient, and effective fashion. Disruptive behavior, such as clapping or refusing to relinquish the podium or microphone when requested, may result in a recess or removal from the meeting.
- Public comment will be permitted on November 8, 2018. There will be no public comment on November 9, 2018.

Speaker Instructions on November 8, 2018:

- The board will not accept new information at the meeting. The board expects comments and information to be submitted during the established public comment periods.
- Public comments were accepted from August 8 through September 21, 2018. Persons or organizations who commented at the public hearing or who submitted written comments will be allowed to address the board on the first day of the meeting, November 8, 2018.

- Those persons and organizations who commented at the public hearing or submitted written comments may speak at the board meeting to respond to the summary of comments. This summary is posted on the BCS webpage and will be presented to the board by the department.
- An organization is considered a single commenter regardless of the number of letters/emails/postcards/signatures submitted by the organization so a single representative of the organization may respond at the board meeting to the summary of comments.
- A person is a single commenter regardless of the number of letters/emails/postcards/signatures submitted by the person.
- In order to speak, you must sign in. Speakers may only sign up for themselves.
- Each commenter may speak for up to 3 minutes.
- Pooling of minutes is allowed for those persons who commented **and** attended the board meeting. Those persons may pool their minutes to allow for a single presentation to the board that does not exceed the time limitation of 3 minutes times the number of persons pooling minutes, or 15 minutes, whichever is less.
- Speaker order: elected officials will be called upon first, followed by those people who have signed in to speak - generally on a first-come, first-served basis except (1) for those pooling minutes, the speaker is not included in the speaking order until all those pooling minutes have signed in and (2) the speaking order will alternate between persons in favor and persons opposed.
- The board reserves the right to alter the time limitations set forth in this policy without notice and to ensure comments presented at the meeting conform to this policy.
- There is no public comment on November 9, 2018.
- Any person wishing to provide the board with a paper copy of their comments should bring 12 copies. Note that the full text of all the comments received from August 8 through September 21, 2018, has been made available to the board and copies of many of the comments have been included in the board books.
- External devices such as flash drives cannot be connected to state-owned computer equipment.
- Please be respectful of all speakers and do not speak out during speakers' comments. Disruptive behavior may result in a recess or removal from the meeting.

Staff Contact:

Cindy M. Berndt, Department of Environmental Quality, 1111 East Main Street, Suite 1400, P.O. Box 1105, Richmond, Virginia 23218; (804) 698-4378; cindy.berndt@deq.virginia.gov.

**TENTATIVE AGENDA
STATE AIR POLLUTION CONTROL BOARD MEETING
NOVEMBER 8-9, 2018**

**RICHMOND CONVENTION CENTER, EXHIBIT HALL BUILDING
EXHIBIT HALL B - ENTRANCE ON 5TH STREET
BETWEEN LEIGH AND MARSHALL STREETS
RICHMOND, VA 23219**

NOVEMBER 8, 2018

CONVENE – 9:30 A.M.

Minor New Source Review Permit for Proposed Buckingham Compressor Station - Summary of comment presentation and opportunity for those who commented at the public hearing or during the public comment period to respond to the summary of the public comment period presented to the Board	Dowd
Memorandum (begins on page 5)	A
Attachment A - Draft Permit (clean) (available on DEQ website)	B
Attachment B - Draft Permit (changes) (begins on page 55)	C
Attachment C - Draft Analysis (available on DEQ website)	D
Attachment D - Modeling Memorandum (available on DEQ website)	E
Attachment E - Sample Comments (available on DEQ website)	F
Attachment F - Response to Comments (begins on page 10)	G

NOVEMBER 9, 2018

CONVENE – 9:30 A.M.

Minor New Source Review Permit for Proposed Compressor Station Applicant Comments, Staff Presentation, and Board Consideration	Dowd
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Adjourn

NOTE: The Board reserves the right to revise this agenda without notice unless prohibited by law. Revisions to the agenda include, but are not limited to, scheduling changes, additions or deletions. Questions on the latest status of the agenda should be directed to Cindy M. Berndt at (804) 698-4378.

PUBLIC COMMENTS AT STATE AIR POLLUTION CONTROL BOARD MEETINGS: The Board encourages public participation in the performance of its duties and responsibilities. To this end, the Board has adopted public participation procedures for regulatory action and for case decisions. These procedures establish the times for the public to provide appropriate comment to the Board for its consideration.

For **REGULATORY ACTIONS (adoption, amendment or repeal of regulations)**, public participation is governed by the Administrative Process Act and the Board's Public Participation Guidelines. Public comment is accepted during the Notice of Intended Regulatory Action phase (minimum 30-day comment period) and during the Notice of Public Comment Period on Proposed Regulatory Action (minimum 60-day comment period). Notice of these comment periods is announced in the Virginia Register, by posting to the Department of Environmental Quality and Virginia Regulatory Town Hall web sites and by mail to those on the Regulatory Development Mailing List. The comments received during

the announced public comment periods are summarized for the Board and considered by the Board when making a decision on the regulatory action.

For CASE DECISIONS (issuance and amendment of permits), the Board adopts public participation procedures in the individual regulations which establish the permit programs. As a general rule, public comment is accepted on a draft permit for a period of 30 days. In some cases a public hearing is held at the conclusion of the public comment period on a draft permit. In other cases there may be an additional comment period during which a public hearing is held. In light of these established procedures, the Board accepts public comment on regulatory actions and case decisions, as well as general comments, at Board meetings in accordance with the following:

REGULATORY ACTIONS: Comments on regulatory actions are allowed only when the staff initially presents a regulatory action to the Board for final adoption. At that time, those persons who commented during the public comment period on the proposal are allowed up to 3 minutes to respond to the summary of the comments presented to the Board. Adoption of an emergency regulation is a final adoption for the purposes of this policy. Persons are allowed up to 3 minutes to address the Board on the emergency regulation under consideration.

CASE DECISIONS: Comments on pending case decisions at Board meetings are accepted only when the staff initially presents the pending case decision to the Board for final action. At that time the Board will allow up to 5 minutes for the applicant/owner to make his complete presentation on the pending decision, unless the applicant/owner objects to specific conditions of the decision. In that case, the applicant/owner will be allowed up to 15 minutes to make his complete presentation. The Board will then allow others who commented at the public hearing or during the public comment period up to 3 minutes to exercise their rights to respond to the summary of the prior public comment period presented to the Board. No public comment is allowed on case decisions when a FORMAL HEARING is being held.

POOLING MINUTES: Those persons who commented during the public hearing or public comment period and attend the Board meeting may pool their minutes to allow for a single presentation to the Board that does not exceed the time limitation of 3 minutes times the number of persons pooling minutes, or 15 minutes, whichever is less.

NEW INFORMATION will not be accepted at the meeting. The Board expects comments and information on a regulatory action or pending case decision to be submitted during the established public comment periods. However, the Board recognizes that in rare instances new information may become available after the close of the public comment period. To provide for consideration of and ensure the appropriate review of this new information, persons who commented during the prior public comment period shall submit the new information to the Department of Environmental Quality (Department) staff contact listed below at least 10 days prior to the Board meeting. The Board's decision will be based on the Department-developed official file and discussions at the Board meeting. In the case of a regulatory action, should the Board or Department decide that the new information was not reasonably available during the prior public comment period, is significant to the Board's decision and should be included in the official file, the Department may announce an additional public comment period in order for all interested persons to have an opportunity to participate.

PUBLIC FORUM: The Board schedules a public forum at each regular meeting to provide an opportunity for citizens to address the Board on matters other than those on the agenda, pending regulatory actions or pending case decisions. Those persons wishing to address the Board during this time should indicate their desire on the sign-in cards/sheet and limit their presentations to 3 minutes or less.

The Board reserves the right to alter the time limitations set forth in this policy without notice and to ensure comments presented at the meeting conform to this policy.

Department of Environmental Quality Staff Contact: Cindy M. Berndt, Director, Regulatory Affairs, Department of Environmental Quality, 1111 East Main Street, Suite 1400, P.O. Box 1105, Richmond, Virginia 23218, phone (804) 698-4378; fax (804) 698-4346; e-mail: cindy.berndt@deq.virginia.gov.

Minor New Source Review Permit for Atlantic Coast Pipeline LLC's Buckingham Compressor Station (BCS),
Registration No. 21599 - Public Participation Report and Request for Board Action

SPEAKER: Michael G. Dowd
Director, Air and Renewable Energy Division
Department of Environmental Quality

INTRODUCTION

Atlantic Coast Pipeline, LLC (ACP) of Richmond, VA submitted an application dated September 11, 2015 to construct and operate a new natural gas pipeline compressor station in Buckingham County, Virginia (Buckingham Compressor Station or BCS). ACP subsequently submitted several application updates based on improvements and changes to the project design. The Local Governing Body Certification Form was received on February 21, 2017. On May 25, 2018, a revised application compiling all of the updates since 2015 was received. The application was deemed complete on July 13, 2018.

BCS is to be constructed on the north side of Route 56, 5.1 miles northwest of the intersection of Route 60 and Route 56, at 5297 S. James River Highway, Wingina (Buckingham County), Virginia. Of the three compressor stations proposed to move natural gas along the Atlantic Coast Pipeline, a 556-mile long interstate pipeline system designed to transport natural gas from West Virginia through Virginia to North Carolina, BCS will be the only one located in Virginia.

Staff analysis has shown that ACP has met the requirements of the minor new source review permitting regulations at 9VAC5 Chapter 80, Part II, Article 6, and that the proposed facility, operating in accordance with the conditions of the proposed permit, will be in compliance with all applicable ambient air quality standards.

PERMIT APPLICATION REVIEW

ACP is proposing to construct and operate the following natural gas-fired compressor turbines:

- A 15,900 hp (129 MMBtu/hr) Solar Mars Model 100-16000 S Compressor turbine (CT-01);
- A 11,107 hp (85 MMBtu/hr) Solar Taurus Model 70-10802 S Compressor turbine (CT-02);
- A 20,500 hp (157 MMBtu/hr) Solar Titan Model 130-20502 S Compressor turbine (CT-03); and
- A 6,276 hp (55 MMBtu/hr) Solar Centaur Model 50-6200 LS Compressor turbine (CT-04).

Along with the turbines, a 6.384 MMBtu/hr natural gas-fired boiler, WH-1 (equipped with low-NO_x burners), will provide building space heat only, and four 21.22 MMBtu/hr natural gas-fired ETI line heaters (LH-01 through LH-04) will provide process heat at the site. A 2,175 bhp natural gas-fired Caterpillar G3516C emergency engine will provide back-up power in the event that grid power is unavailable.

Liquid storage tanks (TK-01 through TK-03) will be used at the facility: TK-01 (2,500 gallon Accumulator Storage Tank) will store pipeline condensate collected by the station's separators and filters. TK-02 (2,000 gallon Hydrocarbon Waste Tank) will receive liquids from the compressor building and auxiliary building floor drains. TK-03 (13,000 gallon Aqueous Ammonia Storage Tank) will store ammonia to be used for the SCR control system for the compressor turbines.

The pollutants subject to Article 6 permitting from the compressor turbines units are nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter having an aerodynamic diameter equal to or less than ten microns (PM₁₀), and particulate matter having an aerodynamic diameter equal to or less than 2.5 microns (PM_{2.5}). NO_x from the units will be controlled using dry low-NO_x combustion and

selective catalytic reduction (SCR). CO, VOC, and formaldehyde will be controlled by oxidation catalyst. Emissions of VOC and hexane (a toxic pollutant) from the venting of natural gas are controlled by capped emergency shutdown system testing, leak detection surveys, and vent gas reduction system for the shutdown and startup venting of turbines. The total emissions from the proposed project are shown in Table 1.

Table 1. Total emissions from proposed BCS

Pollutant	Emissions (tons/yr)
NO _x	34.2
CO	39.2
VOC	9.8
PM10	43.2
PM2.5	43.2
Formaldehyde	4.3
Hexane	0.1

Note: Emissions of regulated toxic pollutants other than those listed above are below permitting exemption thresholds and were therefore not included in Table 1

DEPARTMENT ANALYSIS

Criteria Pollutants

Applicability of Article 6 review is evaluated on a pollutant-specific basis. A new stationary source that has uncontrolled emission rates (UERs) of a pollutant over the exemption thresholds in 9VAC5-80-1105C is subject to review for that pollutant. Pollutants exceeding the respective exemption thresholds for the proposed BCS are NO_x, CO, VOC, PM10, and PM2.5.

Emissions of pollutants subject to Article 6 review are required to undergo a Best Available Control Technology (BACT) analysis and air quality analyses.

BACT

Pollutants subject to Article 6 review from a proposed facility must undergo a BACT analysis. For the proposed BCS, the pollutants subject to BACT are NO_x, CO, VOC, PM10, and PM2.5.

A summary of the BACT analysis is presented in Table 2.

Table 2 – BACT for normal operation

Pollutant	BACT	Control	Compliance
Turbine - NO _x	3.75 ppmvd @ 15% O ₂ (3-hour avg.)	DLN burners SCR	Stack test Operational monitoring (e.g., ammonia injection, SoLoNO _x mode, catalyst temperature)
Turbine - CO	2.0 ppmvd @ 15% O ₂ (3-hour avg.)	Oxidation catalyst	Operational monitoring - (e.g., SoLoNO _x mode, catalyst temperature)
Turbine - PM10	2.86 lb/hr, 1.92 lb/hr, 3.47 lb/hr, 1.20 lb/hr for each respective turbine	Inlet air filters	Stack test
Turbine - PM2.5	2.86 lb/hr, 1.92 lb/hr, 3.47 lb/hr, 1.20 lb/hr for each respective turbine	Inlet air filters	Stack test
Turbine – VOC	1.25 ppmvd @ 15% O ₂ (3-hour avg.)	Oxidation catalyst	Operational monitoring - (e.g., SoLoNO _x mode, catalyst temperature)
Emergency generators - NO _x	2.0 g/hp-hr	Good combustion practices	Stack test, maintenance, hours of operation
Emergency generators - CO	4.0 g/hp-hr	Good combustion practices	Stack test, maintenance, hours of operation
Emergency generators - VOC	1.0 g/hp-hr	Good combustion practices	Stack test, maintenance, hours of operation

Emergency generators – PM10 and PM2.5	5% opacity	Good combustion practices	Stack test, maintenance, hours of operation
Fugitive Leaks – VOC	Fugitive leaks from natural gas piping components	Audio/visual/olfactory (AVO) monitoring and leak repair	recordkeeping
Venting Events - VOC	Vent gas reduction, limitation of events, reduce pressure, capped test events		Operational monitoring (e.g., piping pressure), recordkeeping

Toxic Pollutants/Hazardous Air Pollutants (HAPs)

40 CFR 63 Subpart YYYYY, National Emissions Standards for HAPs from Stationary Combustion Turbines, applies to CTs located at major HAP sources. The HAP emissions from the proposed BCS do not exceed major source thresholds for HAPs (i.e., 10 tons per year of a single HAP or 25 tons per year of all HAPs combined). Accordingly, the proposed facility is not subject to the MACT standard.

Since the facility is not subject to the MACT standard, emissions of toxic pollutants were examined for applicability of the toxic pollutant standards in 9VAC5-60-300. As a result, ACP conducted an evaluation of toxic pollutants and compared proposed emission rates to the emission standards in 9VAC5-60-300. This evaluation includes a modeling analysis for two pollutants for which pre-permit emissions were above the exemption levels in 9VAC5-60-300 (formaldehyde and hexane). The modeling analysis indicates that the impacts of the two pollutants are below their applicable Significant Ambient Air Concentrations (SAACs).

Testing

The permit requires initial compliance testing for NOx, CO, PM10, PM2.5, and VOC from the turbines and emergency engine. Periodic performance testing will continue every two years for the turbines and the earlier of 36 months or 8,760 hours operation for the emergency engine. An initial test to determine proper operation of the vent gas reduction system is also required and must be repeated annually.

The permit allows the permittee to use the fuel quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the fuel to verify that the sulfur content of the natural gas is 1.1 grains or less of total sulfur per 100 standard cubic feet. Alternatively, the permit allows ACP to determine the sulfur content of the natural gas by annual testing.

Monitoring

For proper operation of the SCR system, the permit requires monitoring of the compressor turbine inlet air temperature, ammonia injection rate, catalyst bed inlet gas temperature, pilot operating point, turbine load, and catalyst bed differential pressure. For the oxidation catalyst system, the permit requires monitoring of catalyst bed inlet temperature and catalyst bed differential pressure. ACP must develop a monitoring plan for the turbine monitoring parameters. For the vent gas reduction system, ACP must monitor and record the seal gas pressure and compressor turbine case pressure for each compressor turbine. Records of the daily audio/visual/olfactory (AVO) and quarterly leak detection and repair (LDAR) surveys are also required, as well as corrective actions taken.

Recordkeeping

The permit requires ACP to keep records of all equipment and control device parametric monitoring results; results of fugitive leak inspections; the number of, type of, and emissions from venting events; calculations of monthly emissions from the facility; and duration of startup and shutdown for each turbine. ACP is further required by the permit to keep records of all testing results.

Reporting

ACP must provide semi-annual reports to DEQ of compliance status, including whether or not excess emissions have occurred. ACP is required by the permit to notify DEQ of commencement of construction, facility start-up, and to provide 30-day prior notice for each performance test conducted, and the results of performance tests.

Air Quality Analyses

An air quality analysis via dispersion modeling was conducted to demonstrate compliance with the NAAQS for the criteria pollutants subject to the permit requirements of Article 6: NO_x, CO, VOC, PM₁₀, and PM_{2.5}. For the impact of the VOC emissions, a quantitative analysis was performed in accordance with current EPA guidance. Modeling was completed by ACP and submitted to the Office of Air Quality Assessments for analysis.

An air quality analysis via dispersion modeling was conducted to demonstrate compliance with the Significant Ambient Air Concentrations (SAACs) for hourly and annual formaldehyde emissions and hourly hexane emissions. Modeling was completed by ACP and submitted to the Office of Air Quality Assessments for analysis. The modeling analysis was approved on July 13, 2018 and demonstrated compliance with the applicable NAAQSs and SAACs.

PUBLIC PARTICIPATION ACTIVITIES

Public Notice Procedure

Before an Article 6 permit that meets the criteria of 9VAC5-80-1170D can be issued, the draft permit must undergo a comment period of at least 30 days and a public hearing must be held. The Public Notice for the start of the public comment period for the Buckingham Compressor Station (BCS) appeared in the Farmville Herald on August 8, 2018, announcing a comment period from August 8 until September 11, 2018 with a public hearing conducted on September 11. In addition to the legally required notice, DEQ also published the notice in the Buckingham Beacon on August 10, 2018 to try to reach more members of the community local to the project site. The draft permit and engineering analysis were posted to the DEQ public notice website and the Piedmont Regional Office for review. DEQ also made copies available in the Buckingham County Library.

Prior to noticing the draft permit, Director Paylor determined this permit would be considered by the State Air Pollution Control Board (Board) directly. Therefore, commenters were not required to request Board consideration during the comment period.

Public Hearing

The public hearing was held at the Buckingham Middle School Cafeteria at 1184 High School Road in Buckingham County on September 11, 2018. At the hearing, 191 persons signed in as attending the hearing. Richard Langford, Chairman of the Board, was the hearing officer for the public hearing. During the public hearing, oral comments were received from 60 individuals. Many speakers summarized their comments orally and submitted written comments for the record.

Comments Received

Over the comment period more than 3,800 emails were submitted. One email included a spreadsheet containing over 1,100 individual names and associated comments. The majority of the comments received were general in nature, mostly consisting of various form letters with some slight individualization. DEQ also received more than 500 written comments via postal mail. Again, the majority of these comments are general in nature, made up of various form letters; however, they may mention topics that are also covered in more detailed and technical comments. DEQ received comments from 42 individuals that were of a detailed or technical nature commenting directly on this draft permit. DEQ has reviewed and considered all of the comments received. DEQ has grouped and summarized these comments. DEQ made all comments received available to the Board and posted the comments on DEQ's webpage dedicated to the BCS. In addition, DEQ is providing a sampling of the comments with the response to comments document for the Board for consideration.

DEQ appreciates the public participation and feedback it received regarding this draft permit. The comments are generally organized by topic; however, it should be noted that many commenters addressed multiple topics in their comments.

Changes to the Draft Permit

The following changes were made to the draft permit in response to comments received.

- The terms of the emission limits in Conditions 20 through 23 were clarified to be ppm on a dry volume basis or ppmvd.
 - The term “minimum pilot mode” has been replaced with “SoLoNOx mode” with recordkeeping clarified regarding the parameters of this mode.
 - The delay of equipment leak repairs was clarified to ensure that the total amount of leaking components needs to be compared to the emissions from the required shutdown.
 - An inappropriate reference to a condition was deleted.
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Atlantic Coast Pipeline LLC, Buckingham Compressor Station
Registration Number 21599
Article 6 Draft Permit: Summary of and Response to Public Comments

Public Notice Procedure

Before an Article 6 permit that meets the criteria of 9VAC5-80-1170D can be issued, the draft permit must undergo a comment period of at least 30 days and a public hearing must be held. The Public Notice for the public comment period for the Buckingham Compressor Station (BCS) appeared in the Farmville Herald on August 8, 2018, announcing a comment period from August 8 until September 11, 2018 with a public hearing conducted on September 11. The draft permit and engineering analysis were posted to the DEQ public notice website and the Piedmont Regional Office for review.

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DEQ appreciates the public participation and feedback it received regarding this draft permit. The comments are generally organized by topic; however, it should be noted that many commenters addressed multiple topics in their comments.

General Comments and General Environmental Impacts

Comment

Comments were received in support of the Buckingham Compressor Station and the Atlantic Coast Pipeline and comments were received in opposition to the draft air permit and the Atlantic Coast Pipeline. Where these comments were related to air quality, they were general in nature and did not suggest any specific improvements or short-comings in the draft air permit. Examples of these types of comments are the emissions are too high, the impact is too high, no increases should be approved, the permit limits were very stringent, and the air will be protected. These comments centered around general support for the pipeline and the general

adequacy of the permit or general opposition to the pipeline and a request for denial of the generally inadequate permit.

Some comments pertained to issues regarding station size, eminent domain, noise, traffic, water quality, pipeline necessity, the entire pipeline's impact, Mountain Valley Pipeline, the energy infrastructure or sourcing (e.g., fracking, fossil fuel) of the United States, requiring funds to pay for impacts, or an emergency plan and emergency response capabilities.

Response

Eminent domain, noise, traffic, water quality, pipeline or station size necessity, the Mountain Valley Pipeline, the energy infrastructure, or energy sourcing, requiring funds to pay for impacts, or an emergency plan and emergency response capabilities are topics beyond the purview of the Regulations for the Control and Abatement of Air Pollution that is the authority for this draft permit.

The Regulations for the Control and Abatement of Air Pollution prescribe the requirements that a source must comply with to obtain an air permit. In reviewing the application for this draft permit, DEQ performed a comprehensive regulatory review with respect to Virginia and federal air quality regulations. This includes the health-based standards promulgated by the U.S. Environmental Protection Agency (EPA) as National Ambient Air Quality Standards (NAAQS), as well as Virginia's own health-based standards for toxic pollutants. DEQ's review of the application and subsequent updates demonstrate that the facility will apply the Best Available Control Technology (BACT) for each applicable pollutant.

Air quality analyses were conducted in accordance with Virginia and federal permitting regulations and guidance in order to assess compliance of projected emissions from the proposed facility with all applicable National Ambient Air Quality Standards (NAAQS) and Significant Ambient Air Concentrations (SAAC). Detailed responses to comments regarding modeling and the air quality analysis are provided elsewhere in this document.

The primary NAAQS have been established in order to define air quality levels for sulfur dioxide, nitrogen dioxide, particulate matter, ozone, carbon monoxide, and lead that are protective of public health and welfare, with an adequate margin of safety. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The air quality analyses demonstrated that projected air emissions from the proposed facility would neither cause nor significantly contribute to a violation of any applicable primary or secondary NAAQS.

Hexane and formaldehyde emissions were demonstrated to be in compliance with the SAAC guidelines in Virginia's air toxic pollutant regulation, 9 VAC 5 Chapter 60, Article 5 (Emission Standards for Toxic Pollutants from New and Modified Sources) of Virginia's Regulations for the Control and Abatement of Air Pollution. These standards are designed to be protective of human health and the environment. Many comments suggested that the air quality analyses performed are only for "regional" standards and are not indicative of the impacts that will be experienced by local residents. This is not accurate. Modeling was conducted using the peak emissions from BCS to demonstrate compliance with the standards in the air in Buckingham County as detailed later in this document.

For these reasons, the draft air permit requirements are designed to ensure protection of public health and the environment in accordance with the state and federal ambient air quality standards and regulations. Off-site emissions from the pipeline are not part of BCS.

More detail regarding the subject matter of many of these comments is addressed later in this document in responses to comments that were specific to the draft air permit.

Comment

Many commenters stated there were many improper actions by ACP (or Dominion) during the local process for obtaining a Special Use Permit (SUP) and/or the Federal Energy Regulatory Commission (FERC) process as well as in meetings with local residents.

Response

The perception of the source's statements and actions are not the subject of this air permit action. DEQ has no oversight over those actions.

Comment

Many commenters indicated the public comment period of thirty days was inadequate to provide comments on the draft documents. A variety of reasons were included, such as poor internet access, the technical nature of the permit, access to a printed copy of the permit in the Buckingham County Library, only having weeks to review the information, and deserving an equal amount of time as ACP took in developing its permit application.

Response

DEQ published a notice of the public comment period in the Farmville Herald on August 8, 2018. In addition to the legally required notice, DEQ also published the notice in the Buckingham Beacon on August 10, 2018. The comment period ran from August 8 until September 11, 2018 with a public hearing occurring the evening of September 11, 2018. In response to requests from the public, DEQ decided to consider comments submitted until September 21, 2018. This provided an opportunity to the public in attendance at the public hearing to submit comments based on information learned from other commenters during the hearing. Several commenters indicated this allowance was related to the submission of the documents to the Buckingham Library. The Regional Office is the location in the area that holds the draft documents for inspection. DEQ also provided access to any copies of the documents when requested. During DEQ's meeting with local groups on August 16, 2018 it was noted that some local residents may not have reliable internet access. During that discussion DEQ offered to make documents available at the library. The consideration of comments submitted by September 21 is not related to document availability at the library. DEQ has to balance the interests of the public in commenting on a proposed project and the due process rights of an applicant to a timely decision and a predictable application process;¹ therefore, no additional extensions of the comment period were granted.

Comment

Commenters noted many times that the permit does not explain a certain topic on which they had questions.

Response

This observation is correct. A permit is a technical and legal document containing the conditions with which a source must comply pursuant to applicable air quality laws and regulations. The permit must be read in concert with the permit application, modeling review, and the engineering analysis.

Comment

Commenters expressed concern that the State Air Pollution Control Board may not see all of the comments submitted.

Response

¹ Article 6 does not contain any provisions to extend the comment period.

All comments received were made available to the public as well as the Board via the DEQ website on October 11, 2018. DEQ reviews and considers all comments, summarizes those comments, then prepares responses. This document is that summary and response.

Comment

Virginia's Constitution obligates the Board to protect the resources of the Commonwealth and human health.

Response

Article 11, Section 1 of the Constitution of Virginia sets forth the Commonwealth's policy regarding clean air. It provides in relevant part: "To the end that people have clean air...it shall be the Commonwealth's policy to protect its atmosphere...from pollution...." Section 2 of Article 11 describes how this policy will be implemented. It provides in relevant part: "In the furtherance of such policy, the General Assembly may undertake...the protection of its atmosphere...from pollution...by agencies of the Commonwealth...." In accordance with Article 11, Section 2, the General Assembly has enacted the Virginia Air Pollution Control Law (Code of Virginia §10.1-1300 et seq.), which provides the State Air Pollution Control Board with the responsibilities and authorities to control air pollution. Pursuant to §10.1-1308 of the Code of Virginia, the Board has promulgated numerous regulations to control air pollution, including the minor new source review regulations that are the basis for this draft permit. The draft permit for BCS has been developed in accordance with the applicable requirements of the regulations, including Article 6.

Comment

Commenters stated concerns about potential health impacts due to exposure from radon in the natural gas transmitted by the compressor station.

Commenters stated that compressor stations also present a possible source of radioactive exposure. They indicated that gas in the pipelines typically carries some radon, and as the radon decays, it leaves polonium and lead to build up inside the pipes. When these radioactive by-products are present, workers and nearby residents could be exposed during blowdowns. Gas customers at the end of pipelines also may be exposed. Workers could receive radiation exposure when handling contaminated pipes during routine cleaning or maintenance. Greater attention needs to be paid to potential radon levels and exposure risks.

Commenters stated that the air permit modeling does not address the potential health risks of the radon decay progeny.

Response

Radon is not a regulated pollutant under Article 6 and it is specifically excluded from the definition of "toxic pollutant" in 9VAC5-60-300 (radionuclides). DEQ does not have regulatory authority in this draft air permit to regulate radon. DEQ does not regulate worker safety. FERC considered and responded to comments on radon in their review of the Atlantic Coast Pipeline and the Buckingham Compressor Station.

EPA has promulgated regulations for radionuclides in 40CFR61 Subparts H, I, and K. None of these rules are delegated to Virginia, meaning EPA implements these regulations in the Commonwealth. A review of applicability for these rules reveals they apply to federally owned plants and elemental phosphorus plants. BCS is not in any of these categories.

The following discussion is provided for informational purposes only. According to EPA's radon website, radon is an indoor air quality issue. EPA's measurement of radon exposure is based on an annual timeframe, not short-term. The EPA recommended action level is a concentration of 4.0 picoCurie/liter of air (pCi/L) in the home. If this level is reached, EPA essentially recommends actions to increase air turn-overs thereby reducing the radon concentration. Testing for radon is suggested to be one test of greater than 90 days. Short-

term tests may be averaged to determine a value; however, tests should not be shorter than 48 hours. Instantaneous radon readings do not appear to be relevant.

Pennsylvania's Department of Environmental Protection (PADEP) studied this issue in relation to natural gas produced from the Marcellus Shale². This report determined the maximum indoor radon concentration increase due to natural gas use in the home was 0.13 pCi/L with the average being 0.04 pCi/L. PADEP conducted fence-line monitoring at these stations as well with the highest result being 0.8 pCi/L in any direction over a 62 day period (average ambient air concentration in the United States is 0 to 1.1 pCi/L).

Additional information on radon in Virginia is available at <http://www.vdh.virginia.gov/radiological-health/indoor-radon-program/>.

Comment

Commenters stated that the communication of this public comment period was not sufficient. Some commenters indicated hearings should have been held in Northern Virginia. One commenter questioned publication of the notice of comment period in the Farmville Herald.

Response

The purpose of this public comment period and hearing was to receive comment on the minor new source review (Article 6) permit for BCS, not the Atlantic Coast Pipeline. The regulations require publication in a newspaper of general circulation in the region and the hearing to be held in the region. The Farmville Herald and the Buckingham County Middle School meet these criteria. In addition to the legally required notice, DEQ also published the notice in the Buckingham Beacon on August 10, 2018 to try to reach more members of the community local to the project site. Notice of the public hearing was published on Virginia's Town Hall website. DEQ posted notice of the comment period and hearing on DEQ's website and created a dedicated webpage with information pertinent to BCS. All comments received within the public comment period, regardless of how they are received, whether written or oral, are treated equally such that attendance at a public hearing is not necessary for an individual's comments to be considered.

National Ambient Air Quality Standards (NAAQS)

Comment

Several commenters stated concerns about the NAAQS and whether these standards were adequately protective of human health and the environment. Commenters asserted that the existing NAAQS are insufficient and that citizens' health is not protected.

Commenters also provided and referred to numerous health studies for a variety of pollutants and used many of these as the basis for their comments.

Response

The federal Clean Air Act, which was last amended in 1990, requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of NAAQS. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, and damage to animals, crops, vegetation and buildings. The Clean Air Act also requires periodic review of the science upon which the standards are based and the standards themselves so that the NAAQS are updated periodically as deemed necessary.

² <https://www.dep.pa.gov/Business/Energy/OilandGasPrograms/OilandGasMgmt/Oil-and-Gas-Related-Topics/Pages/Radiation-Protection.aspx>

EPA has set NAAQS for six principal pollutants, which are referred to as “criteria pollutants.” The criteria pollutants are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), and sulfur dioxide (SO₂).

The current EPA policy for review of the NAAQS includes 4 major components:

- 1. Planning*
- 2. Integrated Science Assessment*
- 3. Risk Exposure Assessment*
- 4. Policy Assessment/Rulemaking*

These elements of the NAAQS review process are designed to improve efficiency and ensure EPA’s decisions are informed by the best available science and broad participation among experts in the scientific community. The process will assist EPA’s goal of reviewing each NAAQS on a 5-year cycle as required by the Clean Air Act without compromising the scientific integrity of the process.

With respect to the proposed compressor station, the modeling analysis demonstrates that the proposed facility will not cause or contribute to a violation of any applicable NAAQS. In the event that EPA promulgates revisions to the NAAQS, the facility may be required to reduce emissions to comply with the revised standards.

Model Inputs and Representativeness of Air Modeling Analysis

Comment

Several commenters were concerned that the modeling was not representative of the compressor station site and questioned the appropriateness of modeling inputs such as meteorology, terrain, and seasonal variability of impacts due to inversions.

Commenters pointed out that the air quality of the troposphere, the layer of air closest to the surface of the earth, can be heavily influenced by atmospheric conditions. For example, thermal inversions can interrupt normal air circulation and cause air in a given region to remain there. Commenters suggested that if an inversion were occurring over the proposed compressor station during a discharge of toxic emissions, the toxins would remain in the area longer, subjecting anyone breathing in the area to prolonged exposure.

Commenters also suggested that DEQ should consult with the National Oceanic and Atmospheric Administration's (NOAA) Earth System Research Laboratory (ESRL) Global Monitoring Division to determine air conditions and trends in the Buckingham area, to see if air conditions are compatible with the proposed operational schedule of the proposed compressor station. These commenters suggested that conditions be written into the permit to require the station operators to maintain daily logs of local atmospheric condition data and to prevent them from scheduling blowdowns or other emission events during periods when the air is not circulating normally.

Commenters asserted that the AERMOD modeling was performed in a screening mode using the MAKEMET meteorological dataset and that MAKEMET meteorological data are not actual/observed data, but rather represent a “worst-case” scenario.

Commenters suggested the modeling should be performed using a more robust and reliable air modeling and air quality monitoring program.

Some commenters questioned how the population count was used in the modeling analysis and stated that those calculations were incorrect.

Commenters suggested that the applicant must be required to conduct modeling that considers real-life characteristics such as surrounding land use, local topography, seasonal climatic changes and wind patterns.

A commenter questioned whether the impact of construction emissions, specifically particulate matter, was evaluated for the proposed project.

A commenter stated the turbine manufacturer's emissions estimates were assumed to be at sea level and the elevation of the compressor station was not considered in the modeling analysis.

Response

The air quality modeling analysis for BCS conforms to 40 CFR Part 51, Appendix W - Guideline on Air Quality Models and was performed in accordance with approved modeling methodology. The air quality model used for the analyses was AERMOD (Version 16216r). AERMOD is the preferred EPA-approved regulatory model for near-field applications. The AERMOD model inputs are derived from representative data immediately surrounding the project site.

Modeling was conducted for ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter having an aerodynamic diameter equal to or less than 2.5 microns (PM_{2.5}), and particulate matter having an aerodynamic diameter equal to or less than 10 microns (PM₁₀).

Toxics modeling was also conducted for each pollutant that exceeded applicable exemption rates as defined in 9 VAC 5 Chapter 60, Article 5 (Emission Standards for Toxic Pollutants from New and Modified Sources). Specifically, hourly and annual formaldehyde emissions as well as hourly hexane emissions were modeled.

Meteorological data used in AERMOD included representative hourly values of wind speed, wind direction, and ambient temperature. Since the AERMOD dispersion algorithms are based on atmospheric boundary layer dispersion theory, additional boundary layer variables are derived by parameterization formulas, which are computed by the AERMOD meteorological preprocessor, AERMET. These parameters include sensible heat flux, surface friction velocity, convective velocity scale, vertical potential temperature gradient, convective and mechanical mixing heights, Monin-Obukhov length, surface roughness length, Bowen ratio, and albedo.

Commenters asserted that MAKEMET screening meteorological data were used as input to the model. The meteorological data used in this analysis, however, are based on nearby National Weather Service (NWS) observations and use geophysical and meteorological output fields from the Weather Research and Forecasting (WRF) model (Advanced Research WRF [ARW]) for the period 2013-2015. The meteorological data is extracted from a point located at a distance of approximately 6.14 kilometers from the proposed project site in similar topography (Latitude (° N) 37.605, Longitude (° W) 78.592). DEQ considers these data representative of the project site conditions.

The commenters correctly pointed out that inversions occur in Buckingham County and throughout Virginia and these can lead to pollution being trapped close to the ground. In meteorology, an inversion is a deviation from the normal change of an atmospheric property with altitude and is usually referred to as a temperature inversion (i.e., an increase in temperature with height). Inversions are specifically characterized by the 3-year meteorological data set used in this analysis. Therefore, DEQ believes that the meteorological data is representative and appropriate for assessing these conditions.

DEQ does not support the need for consultation with NOAA ESRL on real-time atmospheric conditions or the establishment of additional permit limits or recordkeeping conditions. The full range of expected meteorological conditions was modeled in the analysis and the results demonstrated compliance with all applicable standards.

AERMAP, AERMOD's terrain preprocessor program, was used to characterize terrain elevations and critical hill heights for the modeled receptors (NAD83 datum and zone 18) using National Elevation Data (NED). These data are actual terrain elevations for the area surrounding the proposed compressor station and were downloaded from the U.S. Geological Survey (USGS) website (<http://seamless.usgs.gov/>). The data used are 1/3 arc second resolution (~10 m resolution) NED. The AERMAP modeling domain ensures that all significant nodes are included such that all terrain features that exceed a 10% elevation slope from any given receptor are considered.

Population data were not specifically used in the modeling analysis. The data were used for comparison of air quality monitoring sites and have no impact on the modeling methodology or results. The differences in population around the facility based on the informal survey, as provided by some commenters, versus the average population per square mile in Buckingham County (52.6 from informal survey vs 29.2 from U.S. Census data) does not alter the conclusion on the air quality monitor selections because the selected sites still have a higher population density.

The project site elevation is approximately 176 meters above mean sea level (MSL). Such a small difference in elevation is not expected to affect emissions. Regardless, the permit contains emission limits that apply to the turbines at the site and requires compliance with those limits.

Emissions from the construction of a stationary source are not included in the Article 6 review of a stationary source. These emissions are temporary and are not considered in the uncontrolled emission rate or the potential to emit of a stationary source. Emissions during construction are subject to the requirements of 9VAC5-50-90, which requires the minimization of fugitive dust using processes such as use of water to keep construction dust down, paving or watering roadways, and the prompt removal of spilled or tracked dirt or other materials from paved streets. The FERC EIS concluded that the construction of ACP and the associated compressor stations would result in temporary increases of pollutant emissions. FERC also determined that the plan to control and mitigate the impact of particulate matter and other pollutants during facility construction was acceptable. DEQ has also reviewed the FERC documentation and concurs with the conclusion that the construction emissions would not have a significant impact on air quality.

Transport and Dispersion of Pollutants

Comment

Several commenters stated concerns about air quality impacts immediately surrounding the facility and further downwind in neighboring counties.

Response

Air pollutants can travel distances from meters to hundreds of kilometers and many meteorological factors such as wind speed, wind direction, and temperature, as well as the source design, can influence the way the emissions are dispersed and the extent of pollutant transport. The air quality analyses for the compressor station were conducted in accordance with Virginia and federal permitting regulations and guidance in order to assess compliance of projected emissions from the proposed facility with all applicable NAAQS and SAAC. The modeling analyses used a dense receptor grid extended to 20 kilometers from the proposed facility. The results of the modeling analyses indicated all modeled concentrations outside of the facility boundary would be below the applicable NAAQS and SAAC. The highest modeled concentrations were located at or near the

facility's property line (i.e., generally within 500 meters of the compressor station). Pollutants rapidly disperse downwind beyond this immediate area and are not expected to cause or contribute to any violations of air quality standards. In addition, all surrounding counties are currently in attainment with applicable air quality standards.

Modeling Scenarios and Evaluation of Peak Emission Rates

Comment

Several commenters stated that peak emission rates were not modeled in the analysis and that DEQ only modeled average emission rates.

Commenters stated that DEQ did not ensure compliance with 9 VAC 5-80-1180 because it relied on flawed ambient air quality modeling. The flaws in the modeling include a failure to use the highest allowable emissions rates, failure to account for emissions in very cold conditions when nitrogen oxide rates are expected to increase significantly, and understating emissions during startup and shutdown. These commenters asserted that DEQ did not ensure the compressor station could operate without preventing or interfering with the attainment or maintenance of any applicable ambient air quality standard and without causing or exacerbating a violation of any applicable ambient air quality standard.

Certain commenters focused on the issue of 1-hr NO₂ modeling and stated that DEQ 1-hr NO₂ modeling fails to reflect emissions when ambient temperatures are lower than 0°F. Commenters stated that *"It appears that Atlantic has performed modeling for one-hour NO₂ concentrations at the higher NO_x emission rates allowed in the pound per hour limits of Conditions 20-23 of the Draft Permit, but those modeling results are not presented in its July 10, 2018 Air Modeling Report."*

Commenters suggested non-regulatory ways to address 1-hr NO₂ impacts at temperatures below 0°F. These included using the 7th highest 1-hr NO₂ concentration or even the 3rd highest concentration instead of the regulatory approved method of the 8th highest concentration averaged over a 3-year period.

Commenters also stated that the permit purports to limit emissions for compliance with regional air quality standards, but it is silent on the actual exposures that people residing nearby will experience when peak emissions occur, such as startup and shutdowns, blowdowns and pigging events. In addition, when the generator is used, peak emissions will include hazardous air pollutants that were not modeled.

Commenters questioned whether DEQ had properly estimated the quantities of all air toxic compounds that will be emitted from the facility and asserted that a proper estimate was needed for quantities of all air toxic compounds that will be emitted from the facility including from the four turbines as well as the fugitive non-combustion sources."

Commenters also stated that the modeling analysis should include acute emissions in addition to annual averages. Specifically, they suggested that annual averages mask short-term exposures that may be high enough to have an adverse impact on human health.

A commenter stated the modeling analysis should include an analysis of the impacts from CO emissions when ambient temperatures are below 0°F.

Response

There are differences between the determination of permit applicability (whether and what type of permit is required for an activity) and the permit drafting (what conditions, limits, requirements are included in the permit). Applicability for the minor new source review program is based on a proposed facility's emissions in

tons per year, an annualized value³. Article 6 is based on uncontrolled emissions, which are calculated using the maximum short-term (e.g., hourly) emission rate without taking into consideration any pollution control devices and assuming that rate is emitted 8,760 hours per year. Once permit applicability is determined, the application review process occurs, including determining BACT and conducting an air quality analysis. The modeling analysis evaluated both short-term peak and annual emissions and compared those results to the applicable air quality standards. These standards are promulgated during the NAAQS process described above, with the averaging times of the standards selected based on the relevant health impacts. The standards and averaging periods that were evaluated are provided in the following table:

Pollutant	Averaging Period	Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$)
<i>O₃</i>	<i>8-hr</i>	<i>70 (ppb)</i>
<i>NO₂</i>	<i>1-hour</i>	<i>188</i>
<i>NO₂</i>	<i>Annual</i>	<i>100</i>
<i>CO</i>	<i>1-hour</i>	<i>40,000</i>
<i>CO</i>	<i>8-hour</i>	<i>10,000</i>
<i>PM_{2.5}</i>	<i>24-hour</i>	<i>35</i>
<i>PM_{2.5}</i>	<i>Annual</i>	<i>12</i>
<i>PM₁₀</i>	<i>24-hour</i>	<i>150</i>
<i>Formaldehyde</i>	<i>1-hour</i>	<i>62.5</i>
<i>Formaldehyde</i>	<i>Annual</i>	<i>2.4</i>
<i>Hexane</i>	<i>1-hour</i>	<i>8,800</i>

Multiple scenarios were modeled using peak hourly (i.e., acute or short-term) and annual (i.e., chronic or long-term) emission rates in order to capture the potential worst-case impacts from the proposed facility. These scenarios included:

1. A range of combustion turbine scenarios including startup and shutdown, as well as the following load and ambient temperature scenarios: 50%, 75%, and 100% loads at <0°F, 0°F, 59°F, and 100°F ambient temperatures. The worst-case emissions and stack parameters were determined for each turbine load case (50%, 75%, and 100%) for each of the four turbines.
2. Toxic pollutant modeling (formaldehyde and hexane) for startup and shutdown operations as well as normal operations. In addition, hexane emissions were modeled for the planned pigging events and purging and blowdown of the turbines during startup and shutdown.
3. All ancillary equipment, including the emergency generator referenced by the commenters, was included in both criteria and toxic pollutant modeling.
4. Fugitive emissions from the compressor station, as provided in the application, were included in the modeling.

DEQ disagrees with comments suggesting that startup/shutdown emissions are understated. The modeling included these emissions scenarios. The emission rates modeled are specified in the permit application. Recordkeeping of these modeling scenario assumptions is included in the draft permit (Condition 35 – Onsite Records).

³ The toxic pollutant rule does consider hourly emissions in applicability as well as annual emissions.

DEQ also disagrees with comments suggesting that 1-hr NO₂ impacts during less than 0°F were not properly considered. EPA has published guidance for air quality modeling analyses for demonstrating compliance with the 1-hr NO₂ NAAQS (U.S. Environmental Protection Agency. (EPA 2011) “Additional Clarification Regarding Application of Appendix W, Modeling Guidance for the 1-hour NO₂ National Ambient Air Quality Standard”, EPA, Office of Air Quality Planning and Standards, Raleigh, NC. March 1, 2011). The guidance provides clarification of how intermittent emissions scenarios should be treated for modeling analyses of 1-hr NO₂. Specifically, page 8 of the guidance states the following:

“...the intermittent nature of the actual emissions associated with emergency generators and startup/shutdown in many cases, when coupled with the probabilistic form of the standard, could result in modeled impacts being significantly higher than actual impacts would realistically be expected to be for these emissions scenarios. The potential overestimation in these cases results from the implicit assumption that worst-case emissions will coincide with worst-case meteorological conditions based on the specific hours on specific days of each of the years associated with the modeled design value based on the form of the hourly standard. In fact, the probabilistic form of the standard is explicitly intended to provide a more stable metric for characterizing ambient air quality levels by mitigating the impact that outliers in the distribution might have on the design value.”

“Given the implications of the probabilistic form of the 1-hour NO₂ NAAQS discussed above, we are concerned that assuming continuous operations for intermittent emissions would effectively impose an additional level of stringency beyond that intended by the level of the standard itself. As a result, we feel that it would be inappropriate to implement the 1-hour NO₂ standard in such a manner and recommend that compliance demonstrations for the 1-hour NO₂ NAAQS be based on emissions scenarios that can logically be assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations.”

DEQ considered the EPA guidance language highlighted above and determined that the emissions scenario associated with operations of the combustion turbines at ambient temperatures less than 0°F are intermittent emissions scenarios that are expected to occur in only rare cases. These situations would not contribute significantly to the annual distribution of daily maximum 1-hour concentrations of NO₂. Over the five year period between 2012 and 2016, two nearby Automated Surface Observation System (ASOS) sites, the Lynchburg Regional Airport (KLYH, WBAN 13733) and the Charlottesville Albemarle Airport (KCHO, WBAN 93736), were analyzed for temperatures below 0°F. The ambient temperature was below 0°F for a total of 5 hours at KLYH, and 1 hour at KCHO. All of these extreme cold events occurred during the year 2015. Temperatures below 0°F were not recorded at either location in the remaining four years of meteorological data. Since the 1-hr NO₂ NAAQS is based on the 98th percentile (i.e., the eighth highest annually) of the daily maximum concentrations, the frequency of this scenario is not high enough to have a significant effect on the design value of the standard itself. Therefore, the below 0°F case for the turbines is not considered in the 1-hr NO₂ modeling analysis. It is important to note that the below 0°F case for the turbines was modeled for all other averaging periods and pollutants, including CO and annual NO₂.

While DEQ does not concur with the non-regulatory recommendations to address 1-hr NO₂ impacts at temperatures below 0°F that were provided, DEQ notes the single highest 1-hr NO₂ impact averaged over 3 years is 167 µg/m³, which is still below the 1-hr NO₂ NAAQS of 188 µg/m³. This result is also more conservative than the suggested 7th highest or 3rd highest values proposed by commenters.

Certain commenters also interpreted the content of the modeling protocol as assuming that the applicant and/or DEQ evaluated 1-hr NO₂ impacts below 0°F. This scenario was only modeled for other pollutants and averaging periods that do not allow the exemption for intermittent activities. These pollutants and averaging periods are deterministic standards that require evaluation. Probabilistic standards such as the 1-hr NO₂

standard can be evaluated using the intermittent activities test. A probabilistic standard is a percentile standard that is averaged over a multi-year period. For example, 1-hr NO₂ is the 98th percentile value (8th highest daily 1-hr concentration) averaged over a 3-year period.

One commenter questions the ppm limitations and indicates they do not correlate to the lb/hr values modeled because the turbines do not operate at 15% oxygen and there is moisture in the air. This is not accurate. While turbine operation is not necessarily at 15% oxygen or in dry air, measured emissions are corrected to 15% oxygen and dry air to ensure that a source cannot dilute the combustion gases in compliance with the limit while actually emitting at a higher rate. The application has the operating information for a variety of operating scenarios for each turbine with the highest value selected for the modeling. The ppm value correlates mass emissions to all of these scenarios and creates a maximum mass emission rate based on the turbine design. No additional lb/hr permit limits are necessary to assure compliance with the NAAQS. The permit is clarified to specify the correction is a dry volume basis (ppmvd). The draft permit contained a notation that the lb/hr limits in the permit applied during 0°F operation and are based on the use of Cold Weather Control Logic required in Condition 1.

In summary, the results of the air quality modeling analysis demonstrate that the proposed Buckingham Compressor Station does not cause or contribute to any short-term or annual modeled violation of the NAAQS for NO₂, PM_{2.5}, PM₁₀, CO, and O₃. The results also demonstrate modeled compliance with the SAAC for formaldehyde and hexane.

Modeling of Emissions during Startup and Shutdown

Comment

Commenters stated that modeling was insufficient because it underestimates the level of emissions that would occur during startup and shutdown operations. Commenters pointed out that the modeling assumes each startup and shutdown to last no more than 10 minutes and that the modeling used blended emission rates. A blended emission rate assumes one startup per pollutant and averaging period modeled.

Commenters noted that startup and shutdown emission rates provided by the turbine vendor are not guaranteed. In addition, commenters suggest that the startup/shutdown emission rates are provided only for the mid-temperature value of 59°F and that emissions could be higher at other temperatures.

Commenters also indicated that Dominion's blended emission rates for its startup/shutdown modeling are significantly understated because they claim that Dominion greatly understated the amount of emissions per startup and shutdown event.

Commenters claimed that the air quality impacts for startup and shutdown were understated, particularly for 24-hour PM₁₀, 24-hour PM_{2.5}, and 8-hour CO, because the modeling reflects 10 minutes of operation in startup or shutdown mode and the remaining time in normal source operation mode. The commenters assert that this is not reflective of the maximum allowable emission rate during startup and shutdown under the terms of the permit, which does not limit the number of startups and shutdowns per day. They also acknowledge that multiple startups and shutdowns in a given day may not be likely.

One commenter provided revised blended startup and shutdown modeling emission rates.

Response

The commenters are correct that the modeling assumes a startup and shutdown time of no more than 10 minutes. Each of these units is designed to startup in this amount of time and the modeling reflects this point.

DEQ disagrees with the commenters' revised blended emission rates for startup/shutdown modeling, along with the assertion that startup/shutdown emissions are understated, for the following reasons:

1. In developing calculations, the comments appear to have used an outdated portion of the application dated May 25, 2018. The applicant's current emission calculations are part of the submittal dated July 10, 2018. All modeling corresponds to values contained in the current calculations. The comments based on calculations using the outdated data are incorrect.
2. Comments that assume that unburned hydrocarbon emissions (UHC) are equivalent to PM10 and PM2.5 are incorrect. UHC is comprised of 10% volatile organic compounds (VOC) and 90% methane (CH4) and ethane (C2H6). Commenters' assumption overstates the startup/shutdown emissions calculations. The applicant's July 10, 2018 submittal provides specific PM10 and PM2.5 calculations.
3. Some comments did not account for the operation of the oxidation catalyst in the shutdown emissions calculations for CO.

Commenters correctly point out that the modeling reflects 10 minutes of operation in startup or shutdown mode and the remaining time in normal source operation mode. These comments suggest that this may be a concern if multiple startups and shutdowns were to occur in a single day. DEQ is not requiring limits on the number of startups and shutdowns, and the duration of these events for the following reasons:

1. PM10 and PM2.5 emissions during startup and shutdown are appreciably lower than emissions during normal operation. Therefore, the air quality impacts would be lower if there were multiple startups and shutdowns in a given 24-hour period. As an example, the Solar Titan 130 unit proposed for BCS has a startup PM2.5 emission rate of 0.11 pounds per event. Using the design startup time of 10 minutes yields an equivalent hourly rate of 0.66 pounds per hour. The normal emission rate for this unit is 3.46 pounds per hour, over 5 times the emission rate during startup. A similar relationship exists for all four turbines.
2. 24-hour PM10 and PM2.5 modeling accounts for one startup or shutdown per unit per day or a total of 4 events per day.
3. 8-hour CO modeling accounts for 3 startups or shutdowns per unit per day or a total of 12 events per day.
4. The cumulative 8-hour CO modeling results for startup and shutdown are provided below:

Scenario	8-hour CO Result ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
Startup	1,382	10,000
Shutdown	1,381	10,000

As can be seen from the results in the table, it is not reasonable to assume an 8-hour NAAQS violation would occur, even assuming multiple startups and shutdowns in a given day as suggested by the comments.

5. Additional 8-hour CO modeling was conducted using an assumption of a startup or shutdown for every hour of the day to provide additional assurance that the NAAQS is protected. The results are provided below.

8-hr CO Modeling Results
(Assumes SU/SD Operations Every Hour over 8 Hours)

<i>Pollutant</i>	<i>Averaging Period</i>	<i>Total Concentration (µg/m³)</i>	<i>NAAQS (µg/m³)</i>
<i>CO</i>	<i>8-hour</i>	<i>1,455</i>	<i>10,000</i>

6. Finally, DEQ performed additional CO and NO₂ modeling beyond regulatory requirements to provide additional assurance that air quality was protected. The results provided below illustrate that NAAQS compliance is demonstrated even when using the assumption of a full hour (60 minutes) for turbine startup and shutdown events. These results clearly demonstrate that the assumption of a 10-minute startup or shutdown is inconsequential in the determination of NAAQS compliance. As previously discussed, results are not provided for PM10 and PM2.5 because startup and shutdown emissions for particulate matter are significantly lower than normal operations.

Startup/Shutdown Modeling Results
(Assumes 60 Minutes for Startup/Shutdown Events)

<i>Pollutant</i>	<i>Averaging Period</i>	<i>Total Concentration (µg/m³)</i>	<i>NAAQS (µg/m³)</i>
<i>NO₂</i>	<i>1-hour</i>	<i>112.4</i>	<i>188</i>
<i>CO</i>	<i>1-hour</i>	<i>3,091</i>	<i>40,000</i>
<i>CO</i>	<i>8-hour</i>	<i>2,337</i>	<i>10,000</i>

In summary, DEQ disagrees with comments suggesting that the startup/shutdown modeling underestimates impacts or that additional limits on the number of startups and shutdowns per day, or the duration of these events are needed.

Background Air Quality Data and Ambient Air Monitoring

Comment

Several commenters stated concerns about the background air monitoring sites and the lack of baseline data in Buckingham County. Specifically, commenters stated that “the baseline locations for comparison of air emissions are problematic” and that “documents argue they used the best available comparative location for each specific emission under analysis, but circumstances are dissimilar.”

Other commenters stated that background levels are supposed to represent the contributions from all other emissions sources and the regional background for the NAAQS limit and that the assumed background level can have a significant effect on the modeled results (e.g., attainment vs. non-attainment).

Commenters requested that DEQ share the data documenting the current ambient air quality surrounding the compressor station.

Response

Cumulative NAAQS modeling requires the use of background concentrations from ambient monitoring data. These data are combined with the modeled impact from the proposed facility and other nearby sources to determine the total air quality impact. Background air quality represents contributions from natural sources,

other unidentified sources near the project that are not explicitly modeled, and regional transport contributions from more distant sources (domestic and international).

A conservative aspect of the modeling analysis is that it incorporates a monitored design value to represent background air quality for each short-term NAAQS. This practice is exceedingly conservative and often results in an unrealistic characterization of the total air quality impact. DEQ and EPA frequently use this approach as a starting point even though it is clear that hourly background concentrations vary and are often far below the design value. Another conservative component of the modeling is that the background air quality value is added to the cumulative NAAQS modeling result for the proposed compressor station and nearby sources.

As illustrated in the table below, the background air quality at the proposed facility location would have to be significantly higher than the selected monitored concentrations in order for a predicted NAAQS violation to occur.

Pollutant	Avg. Period	BCS Impact ($\mu\text{g}/\text{m}^3$)	Ambient Background Used in Analysis ($\mu\text{g}/\text{m}^3$)	Ambient Background to Cause NAAQS Exceedance ($\mu\text{g}/\text{m}^3$)	2014-2016 Statewide Virginia Maximum Monitored Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	% Increase in Background Concentration for NAAQS Violation
<i>NO₂</i>	<i>1-hour</i>	<i>42.0</i>	<i>75.2</i>	<i>146</i>	<i>78.96</i>	<i>188</i>	<i>94%</i>
<i>NO₂</i>	<i>Annual</i>	<i>3.5</i>	<i>16.92</i>	<i>96.5</i>	<i>26.32</i>	<i>100</i>	<i>470%</i>
<i>CO</i>	<i>1-hour</i>	<i>303</i>	<i>1,374</i>	<i>39,697</i>	<i>4,236.5</i>	<i>40,000</i>	<i>2789%</i>
<i>CO</i>	<i>8-hour</i>	<i>122</i>	<i>1,259.5</i>	<i>9,878</i>	<i>1,946.5</i>	<i>10,000</i>	<i>684%</i>
<i>PM_{2.5}</i>	<i>24-hour</i>	<i>6.6</i>	<i>15</i>	<i>28.4</i>	<i>22</i>	<i>35</i>	<i>89%</i>
<i>PM_{2.5}</i>	<i>Annual</i>	<i>1.5</i>	<i>7.2</i>	<i>10.5</i>	<i>8.5</i>	<i>12</i>	<i>46%</i>
<i>PM₁₀</i>	<i>24-hour</i>	<i>9.1</i>	<i>27</i>	<i>140.9</i>	<i>31</i>	<i>150</i>	<i>422%</i>

DEQ uses its existing statewide monitoring network to develop background ambient air concentrations for modeling. These data conform to the same quality assurance and other requirements as those networks established for Prevention of Significant Deterioration (PSD) permitting purposes. Accordingly, the air quality monitoring data has sufficient completeness and undergoes appropriate data validation procedures.

Monitoring sites, in part, are selected based on the review of EPA-recommended criteria such as emissions data and population density. The table below provides a summary of these criteria for the background sites and the project site.

Monitor Station Location	2014 NEI (tons NOx)	2014 NEI (tons CO)	2014 NEI (tons PM_{2.5})	2014 NEI (tons PM₁₀)	County Pop.	Pop. per Square Mile
<i>(Project Site)</i>	<i>540</i>	<i>4,057</i>	<i>440</i>	<i>1,834</i>	<i>17,048</i>	<i>29.6 / 52.6</i>
<i>Harrisonburg, VA</i>	<i>3,104</i>	<i>---</i>	<i>---</i>	<i>---</i>	<i>79,744</i>	<i>89.9</i>
<i>Henrico County, VA</i>	<i>---</i>	<i>---</i>	<i>---</i>	<i>2,710</i>	<i>326,501</i>	<i>1,313.4</i>
<i>Vinton, VA</i>	<i>---</i>	<i>12,781</i>	<i>---</i>	<i>---</i>	<i>94,031</i>	<i>368.7</i>
<i>Lynchburg, VA</i>	<i>---</i>	<i>---</i>	<i>576</i>	<i>---</i>	<i>80,212</i>	<i>1,538.2</i>

In all cases, the emissions and population density surrounding the selected monitor are greater than Buckingham County and the informal survey data provided in the comments. The emissions data in the table are from the 2014 National Emissions Inventory (NEI) and represent the total emissions from all source sectors. DEQ also evaluated the traffic and commuting patterns, meteorology (weather/transport patterns), and topography surrounding the project site. Buckingham County is not unique with respect to any of these parameters when compared to the existing statewide monitoring network.

Pursuant to 40 CFR Part 58, Ambient Air Quality Surveillance, the monitoring network operated by Virginia is subject to an annual monitoring plan and periodic network assessment to determine adequacy. EPA has determined that this existing network satisfies the requirements of 40 CFR Part 58.

Finally, minor NSR does not have a regulatory requirement for the facility to undergo a preconstruction monitoring review. This requirement only applies to new and modified PSD facilities. DEQ also recognizes that the process of operating a monitoring network and collecting ambient data for up to one year prior to the submittal of a minor source application represents a substantial and unnecessary burden on any applicant, particularly in cases where existing data are available and sufficient to meet these needs.

DEQ considers the background air quality used in this project to be appropriate and conservatively representative of existing air quality in the area surrounding the proposed compressor station.

Cumulative NAAQS Analysis and Nearby Source Inventory

Comment

Commenters suggest that the NAAQS compliance analysis is inadequate because it fails to model actual short-term emission rates for contributing sources for the short-term average NAAQS modeling. This assertion is based on the hypothesis that the modeling understates hourly emission rates because of an assumption of 8,760 hours of operation for nearby sources.

Commenters suggest that the modeling analysis did not include all contributing sources. Commenters state that all nearby sources that could produce a significant concentration gradient near the compressor station should have been included. Specifically, commenters suggest that the Dominion Bear Garden Generating Station should have been included and estimate that it “appears to be roughly eight or nine miles from the proposed Buckingham Compressor Station.”

Response

The nearby source inventory includes all sources that would be expected to cause a “significant concentration gradient” in the vicinity of the compressor station as currently defined in 40 CFR Part 51, Appendix W (Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches To Address Ozone and Fine Particulate Matter. January 17, 2017). In Appendix W, EPA makes it clear that the identification of nearby sources to be modeled is regarded as an exercise of professional judgment of the reviewing authority.

DEQ carefully evaluated all nearby sources for potential inclusion in the analysis. This review included the Dominion Bear Garden facility. The rationale for not including the Dominion Bear Garden facility in the nearby source inventory is based on the following:

- 1. The concentration gradient associated with a particular source will generally be largest between the source location and the distance to the maximum ground-level concentrations from the source. Beyond the maximum impact distance, concentration gradients will generally be much smaller and more spatially uniform. A general “rule of thumb” for estimating the distance to maximum impact and the region of significant concentration gradients that may apply in relatively flat terrain is approximately 10 times the source release height. For example, the maximum impact area and region of significant concentration gradients associated with a 100-meter stack in flat terrain would be approximately 1,000 meters downwind of the source, with some variation depending on the source characteristics affecting plume rise. However, the potential influence of terrain on maximum 1-hour pollutant impacts may also significantly affect the location and magnitude of concentration gradients associated with a particular*

source. Even accounting for some terrain influences on the location and gradients of maximum 1-hour concentrations, these considerations suggest that the emphasis on determining which nearby sources to include in the modeling analysis should focus on the area within about 10 kilometers of the project location in most cases. The routine inclusion of all sources beyond this distance is likely to produce an overly conservative result.

2. The level of actual emissions over the past 2 years and the downwind distance of this facility do not dictate the need to include the facility as a nearby source. The actual emissions are provided below:

Year	NOx Emissions (tons/yr)	CO Emissions (tons/yr)	PM10 Emissions (tons/yr)	PM2.5 Emissions (tons/yr)
2015	100.88	18.90	20.95	20.95
2016	98.31	19.48	21.22	21.22

The estimated distance to the Dominion Bear Garden facility provided in the comments is incorrect. The facility is approximately 21.5 miles (~34.5 kilometers) away from BCS as opposed to the estimated 8 or 9 miles in the comments. In addition, many states use a method developed by North Carolina DENR to screen sources in the nearby modeling inventory. This approach, referred to as 20D, includes sources whose emissions (TPY) are greater than 20 times the distance to the facility (kilometers). Under the 20D approach it might be appropriate to include Dominion Bear Garden if its actual emissions were greater than 690 TPY. As shown in the table above, actual emissions are significantly below this threshold.

3. The conservative background concentrations used in the modeling more than account for Dominion Bear Garden and any other sources not explicitly included in the modeling analysis.

The commenters are correct in stating that the operational level for nearby sources for short-term averaging times is the temporally representative level when actually operating, reflective of the most recent 2 years of data. The commenters are also correct that unilaterally assuming 8,760 hours of operation might be inappropriate for some sources. However, there are important aspects of the nearby source inventory that are important to note.

1. The table below illustrates that the modeled nearby source inventory emissions were actually overestimated by the applicant by a factor of two.

Pollutant	Nearby Source Inventory Modeled Emissions (TPY)	Nearby Source Inventory Actual Emissions (TPY)
NOx	1,020	450
CO	1,131	543
PM10	90	42
PM2.5	81	35

2. The vast majority of the emission units in the nearby source inventory reported operating hours of 8,760 hours per year so it was appropriate to divide these individual units by 8,760.
3. In response to concerns expressed by commenters, DEQ conducted additional modeling runs to provide additional assurance that the NAAQS are protected. DEQ conducted an additional run revising the modeling using the actual hours of operation for all sources and eliminated the double counting of nearby source emissions. These results are, as expected, equal to or lower than the original results depending on the pollutant and averaging period. DEQ also revised the modeling using the available

permit allowable emission rates for nearby sources favored by some commenters. This approach is outdated, overly conservative, and inconsistent with the current EPA modeling guidelines. DEQ conducted this additional modeling to provide additional assurance that the NAAQS are protected. Under this approach, the permitted allowable modeling run also includes the Dominion Bear Garden facility despite the fact that this facility is at a distance that would not cause a significant concentration gradient in the vicinity of the proposed compressor station. All supplemental modeling results are provided in the table below.

Pollutant	Averaging Period	RUN 1 Concentration ($\mu\text{g}/\text{m}^3$)	RUN 2 Concentration ($\mu\text{g}/\text{m}^3$)	RUN 3 Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
<i>NO₂</i>	<i>1-hour</i>	<i>117.2</i>	<i>112.0</i>	<i>169.4</i>	<i>188</i>
<i>NO₂</i>	<i>Annual</i>	<i>20.4</i>	<i>20.4</i>	<i>20.4</i>	<i>100</i>
<i>CO</i>	<i>1-hour</i>	<i>1,677</i>	<i>1,677</i>	<i>1,677</i>	<i>40,000</i>
<i>CO</i>	<i>8-hour</i>	<i>1,382</i>	<i>1,382</i>	<i>1,382</i>	<i>10,000</i>
<i>PM_{2.5}</i>	<i>24-hour</i>	<i>21.6</i>	<i>21.6</i>	<i>21.6</i>	<i>35</i>
<i>PM_{2.5}</i>	<i>Annual</i>	<i>8.7</i>	<i>8.7</i>	<i>8.7</i>	<i>12</i>
<i>PM₁₀</i>	<i>24-hour</i>	<i>36.1</i>	<i>36.1</i>	<i>44.6</i>	<i>150</i>
<i>Run 1 - Original modeling</i>					
<i>Run 2 - Modified nearby source inventory using actual tons per year and actual hours of operation</i>					
<i>Run 3 - Nearby source inventory using available permitted allowable emissions</i>					

In summary, DEQ believes that the original nearby source inventory and modeling analysis is both conservative and most appropriate. The supplemental modeling results further support this point and all runs demonstrate compliance with the NAAQS.

Evaluation of Ozone and Secondary PM_{2.5} Impacts

Comment

Commenters stated that the application and draft permit do not contain an analysis of the ozone impacts. Commenters also expressed concern that the impact on downwind nonattainment areas (i.e., Washington, D.C. Metropolitan Statistical Area (DC MSA)) was not evaluated.

Commenters asserted that the application and draft permit do not contain any analysis of the secondary PM_{2.5} impacts due to emissions of NO_x and SO₂ from the facility. Certain commenters also did not agree with the use of the EPA’s “Modeled Emissions Rates of Precursors (MERP)” approach in evaluating secondary PM_{2.5} impacts.

Response

DEQ evaluated ozone and PM_{2.5} impacts in accordance with EPA’s Guideline on Air Quality Models. The Guideline outlines a multi-tiered approach for single source permit assessments. The tiered approach is primarily designed for major sources of air pollution subject to Prevention of Significant Deterioration (PSD) permitting but can also be applied to smaller sources such as the proposed compressor station.

DEQ believes that the use of MERPs represents the use of a technically credible relationship between emissions and ambient impacts. The MERPs are based on extensive nationwide EPA photochemical modeling. The EPA modeling reflects the sensitivity of the project area’s air quality level to precursor emissions changes and provides an appropriate basis for evaluating the impacts of these precursors to PM_{2.5} and ozone formation. In other words, DEQ believes that the MERPs modeling adequately represents the regional and local atmospheric conditions for the compressor station.

As correctly stated by the commenters, PM2.5 is emitted directly from the proposed compressor station and also formed in the atmosphere from PM2.5 precursor emissions (NOx and SO2). The modeling for this project accounted for the total air quality impact of PM2.5 by taking the modeled concentrations of direct PM2.5 from the facility and summing these results with a concentration representative of PM2.5 formed from the project's precursor emissions.

The nearest and most representative PM2.5 modeling receptor is located in Dinwiddie County, Virginia. The table below shows the modeled contribution of precursor emission using the MERPs.

Contributions to PM2.5 from Individual Precursor Emissions

<i>Averaging Period</i>	<i>NOx Contribution (µg/m³)</i>	<i>NOx Contribution Eastern US Maximum Value (µg/m³)</i>	<i>SO2 Contribution (µg/m³)</i>	<i>SO2 Contribution Eastern US Maximum Value (µg/m³)</i>
<i>24-hour</i>	0.00889	0.01788	0.00930	0.01586
<i>Annual</i>	0.00034	0.00067	0.000232	0.00041

The table clearly illustrates that the contribution to PM2.5 impacts from the compressor station's precursor emissions is extremely small. DEQ has also provided the contribution analysis using the worst-case modeling receptor in the Eastern United States. Using these results would also demonstrate NAAQS compliance.

<i>Pollutant</i>	<i>Averaging Period</i>	<i>Total Concentration (µg/m³)</i>	<i>NAAQS (µg/m³)</i>
<i>PM2.5</i>	<i>24-hour</i>	21.6	35
<i>PM2.5</i>	<i>Annual</i>	8.7	12

The MERPs were also used to quantify the ozone impacts. The nearest and most representative modeling receptor, as with PM2.5, is located in Dinwiddie County, Virginia. The table below shows the modeled contribution of precursor emissions to ozone formation. Again, DEQ provided the contribution analysis using the worst-case modeling receptor in the Eastern United States.

Contributions to Ozone from Individual Precursor Emissions

<i>Averaging Period</i>	<i>NOx Contribution (ppb)</i>	<i>NOx Contribution Eastern US Maximum Value (ppb)</i>	<i>VOC Contribution (ppb)</i>	<i>VOC Contribution Eastern US Maximum Value (ppb)</i>
<i>8--hour</i>	0.1368	0.2012	0.00117	0.00845

The current monitored ozone design value for the area is 60 ppb. The addition of the Project's worst-case daily impact to the design value equals 60.14 ppb which is well below the 8-hour ozone NAAQS of 70 ppb. Furthermore, using MERPs is conservative on the basis that it sums a daily maximum 8-hour ozone concentration to a design value. The compressor station's actual impact on the design value (4th highest ozone concentration averaged over 3 years) is expected to be much lower based on DEQ's ozone modeling experience.

Finally, DEQ can state with certainty that a 34 TPY NOx and 10 TPY VOC source would not significantly contribute, as defined by EPA under the PSD program as 1 part per billion (8-hour ozone average), to the DC MSA based on the aforementioned modeling results. The commenters should also be aware that the emission increases associated with the proposed compressor station, located approximately 90 miles from the southern boundary of the DC MSA, are far below the nonattainment area major source emissions thresholds for NOx

(100 TPY threshold) and VOC (50 TPY threshold). Facilities in nonattainment areas that are below those thresholds do not have to receive major new source review permits and are not required to install air pollution control equipment that meets the “Lowest Achievable Emission Rate” (LAER) or obtain emissions offsets.

Risk Assessment

Comment

Many comments were received regarding the need to perform a risk assessment, such as a comprehensive risk analysis or a health impacts assessment.

Several commenters stated concerns about the lack of any risk assessment for the project and proposed a variety of risk assessment options. Many commenters demanded that DEQ complete a Comprehensive or Quantified Risk Assessment for the Buckingham Compressor Station prior to permitting and to work with other state agencies to conduct a Health Risk Assessment (HRA) and a Health Impact Assessment (HIA).

Commenters expressed concern about the adverse impacts on human health. Commenters provided and referred to numerous health studies and provided data to support their statements.

Commenters also expressed concern about the synergistic (i.e., combined) effects of multiple pollutants.

Commenters referenced other studies around compressor stations, specifically New York’s Minisink Compressor station and Pennsylvania’s Washington and Susquehanna Counties.

Response

The State Air Pollution Control Law and implementing regulations do not provide authority to require a multi-media risk assessment and consideration of the many factors outside of environmental regulation that are involved in such an assessment as part of the determination for issuing an air permit.

The Federal Clean Air Act requires that EPA establish and update National Ambient Air Quality Standards designed to protect human health and welfare. DEQ developed the proposed permit for BCS to ensure compliance with these health based standards. Therefore, within the context of air quality laws and regulations, risk was evaluated by requiring the applicant to demonstrate compliance with both acute (short-term) and chronic (annual) air quality standards. For example, the NAAQS are based on air quality criteria which are established to accurately reflect the latest scientific knowledge useful in indicating the nature and extent of identifiable effects on public health or welfare that may be expected from the presence of the pollutant in ambient air. The EPA Administrator promulgates and periodically reviews, at five-year intervals, primary (health-based) and secondary (welfare-based) NAAQS for such pollutants. Based on periodic reviews of the air quality criteria and standards, the Administrator can make revisions in the criteria and standards and promulgate any new standards as may be appropriate. The Clean Air Act also requires that an independent scientific review committee advise the EPA Administrator as part of this NAAQS review process, a function performed by the Clean Air Scientific Advisory Committee (CASAC).

Key components of the NAAQS review are the Integrated Science Assessment (ISA) and the Risk/Exposure Assessment (REA). The ISA is a comprehensive review, synthesis, and evaluation of the most policy-relevant science, including key science judgments that are important to inform the development of the risk and exposure assessments, as well as other aspects of the NAAQS review. The REA draws upon information and conclusions presented in the ISA to develop quantitative characterizations of exposures and associated risks to human health or the environment associated with recent air quality conditions and with air quality estimated to just meet the current or alternative standard(s) under consideration. This assessment includes a characterization of the uncertainties associated with such estimates.

Toxic pollutants were also evaluated as part of this permitting process. Emissions estimates of federal hazardous air pollutants (HAPs) known to result from compressor station operations were provided as part of the permit application for BCS. Two of these HAPs, formaldehyde and hexane, exceeded the exemption rates contained in 9VAC5-60-300,⁴ requiring BACT and an air quality analysis under the toxics rule. The Virginia air toxic pollutant regulation establishes a health-based ambient air standard for each pollutant and is intended to protect the health of the most susceptible person on both an hourly (acute) and annual (chronic) basis. The air quality analysis for BCS demonstrates compliance with the applicable Significant Ambient Air Concentrations (SAACs).

The NY Department of Environmental Conservation air permit for Minisink⁵ limits NOx to 25 ppm and opacity. There are no limitations on venting events, pigging, CO, VOC, or toxic pollutants. Emissions from Minisink cannot be compared to BCS because of the more stringent requirements set forth in the draft permit for BCS.

Two health studies were referenced in the comments as setting forth the types of health impacts that may be of concern in Buckingham County: one in Washington County, PA, the other in Susquehanna County, PA in Brooklyn Township. A review of several different websites indicate hundreds of natural gas wells in the area of Brooklyn Township⁶ and approximately 1,000 wells in Susquehanna County⁷. Buckingham County is not a similar circumstance. The ATSDR study referenced clearly indicates the limitations on using the study, “The PM2.5 data collected and analyzed represents air quality at one location in close proximity to the Williams Central Compressor Station and should not be generalized to all natural gas compressor stations or to other locations in Brooklyn Township.” A review of the Pennsylvania Department of Environmental Protection (PADEP) website indicates the compressor station in question is subject to Pennsylvania’s General Permit 5, which is considerably less stringent in terms of limitations on blowdowns⁸.

As indicated above and in response to other comments, modeling conducted for this proposed facility predicted maximum concentrations of pollutants to which an individual might be exposed⁹. When the predicted concentrations were compared to the individual pollutant standards, compliance was shown in each case.

Air Toxics Modeling

Comment

Commenters stated that the modeling does not adequately demonstrate that the proposed compressor station will not cause or contribute to a violation of any SAAC for toxic pollutants.

Some commenters wrote that all sources (ancillary equipment and fugitive emissions) were not included in the toxics modeling analysis. Others suggested that the wrong emission rates were modeled for formaldehyde and hexane. Some comments expressed confusion about the modeling results. Specifically, it was noted in some

⁴ This regulation mandates the use of the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). The TLVs are reduced by fractions (1/20, 1/40, and 1/500) depending on the particular toxic pollutants information. The calculation for both the exemption thresholds and the SAACs are laid out in this regulation.

⁵ <https://www.dec.ny.gov/dardata/boss/afs/permits/333380004500001.pdf>

⁶ https://www.marcellusgas.org/?county_id=2&muni_id=11 visited October 3, 2018

⁷ <http://stateimpact.npr.org/pennsylvania/drilling/counties/susquehanna-county/> visited October 3, 2018

⁸ While GP-5 was recently revised to be more stringent, that version of the general permit did not apply during the timeframes cited in the study.

⁹ Some comments referenced hydrogen sulfide (H₂S), which does not have an ambient air quality standard. Assuming all sulfur in the natural gas was H₂S, the total emissions would be less than 0.1 tons per year, which is less than the exemption threshold of 9 tons per year in 9VAC5-80-1105C.

comments that the reason that the formaldehyde results were similar for both startup and normal operations was not understood.

Commenters also asserted that DEQ must require a cumulative modeling analysis of the Buckingham Compressor Station with other sources of formaldehyde in the area.

Commenters indicated that additional toxic pollutants should have been included in the modeling.

Finally, some comments suggested that the hexane modeling used a much higher volume of gas and thus a higher amount of hexane emissions by assuming a blowdown from maximum station operation pressure (1400 PSIG) rather than assuming a 44.7 PSIA gas pressure limit as required by the permit. Those comments asserted that a much higher gas pressure would result in a comparatively higher gas discharge velocity and would allow for more dispersion of the gas. As a result, the model would predict lower hexane concentrations than may actually occur with a blowdown event.

Response

Toxics modeling is required for individual pollutants that exceed the applicable exemption rates in the Virginia air regulations. Hourly and annual formaldehyde emissions, in addition to hourly hexane emissions, exceeded these exemption rates and required toxics modeling. All other hazardous air pollutants emitted by the proposed compressor station are below the applicable exemption rates and modeling was thus not required by the regulations.

The commenters are correct that formaldehyde modeling was conducted for the 50%, 75%, and 100% load scenarios for normal operations, startup and shutdown, and pigging operations. The 100% load emission rates were conservatively modeled for all normal load operating scenarios. It is also important to note that the stack parameters properly corresponded to the load being modeled. This is noted in the applicant's modeling report (see footnote to Table D-3).

Some comments provided formaldehyde emissions calculations but did not apply the 50% control efficiency of the oxidation catalyst during normal operations and shutdown, which would result in an overstatement of emissions.

Some comments appear to assume that the modeling did not include other sources of formaldehyde at the proposed compressor station besides the four turbines; such an assumption is inaccurate. All formaldehyde emissions, including the ancillary equipment and fugitive emissions (see Table D-1 of the applicant's modeling report), were included in the formaldehyde and hexane modeling.

Commenters correctly pointed out that the formaldehyde emission rates of the startup scenario are higher than the formaldehyde emission rates modeled for normal source operations. They also correctly noted that there was not a significant increase in the modeled formaldehyde concentration for these scenarios. A closer examination of the individual source contributions to the modeling results demonstrate that the emergency generator is the primary contributing source to all formaldehyde modeling scenarios (greater than 90%). This is the primary reason that changes in load scenarios did not change the magnitude of the results. In other words, the turbines had little contribution to the maximum modeled impacts. Also, the emergency generator was modeled at 8,760 hours of operation for short-term toxics analyses (as opposed to the 500 hour per year limit in the permit) which yields a highly conservative modeling result.

Cumulative modeling of nearby sources of toxic pollutants is not required under the Virginia toxic pollutant regulation. In 9VAC5-60-330, the regulation clearly states the SAAC is for a determination between the Board and the owner. All of the compliance provisions only apply to the owner. Article 6 is the implementing

program for the state toxics rule. Article 6 is a permit program for new stationary sources and projects at existing stationary sources. If the source modeling indicates a SAAC exceedance and the source cannot control emissions from the entire stationary source sufficiently, or succeed in utilizing one of the other compliance options, DEQ does not issue the requested Article 6 permit even if it is for a small project (i.e., small portion of the entire stationary source).

For BCS it is important to note the following in the event that multi-source toxics modeling was performed:

1. The closest point source in the nearby source inventory is approximately 16.5 kilometers downwind. It is expected that chemical reactions that take place between the proposed compressor station and the nearest downwind source would render an AERMOD analysis result meaningless at that distance.
2. The maximum toxic pollutant impacts from the compressor station are on or close to the property fence line (within 500 meters) and interaction with any nearby sources is highly unlikely.

Finally, the modeling analysis for blowdowns is consistent with the limits in the draft permit (44.7 PSIA – equivalent to 30 PSIG) regarding equipment blowdowns. Specifically, the applicant calculated the volume of gas that would be vented based on the system design and a pressure of 44.7 PSIA in the system prior to blowdown. The flow to each blowdown stack was estimated and both a mass of hexane and velocity for the discharge from each blowdown stack was calculated. These data were obtained by using engineering design data.

The table below summarizes the flows assumed for both startup and shutdown of the turbines. The numbers show a back calculation of the exit volume given the velocity and stack area (diameter) used in the modeling and compare that to the values from Table C-3A from the emissions basis in Appendix C of the application. Small differences in volumetric flow from model versus Table C-3A values are due to rounding. For comparison, the volumes associated with a blowdown from 1400 PSIG are also shown. As can be seen, the modeling did not rely on these higher flow rates associated with 1400 PSIG.

Startup	Model						PTE Calculations
	m/s	ft/sec	ft/min	diameter (ft)	area (ft ²)	cfm	cfm
Unit 1	1.77	5.81	348.43	2.00	3.14	1,095	1,095
Unit 2	2.24	7.35	440.94	2.33	4.28	1,886	1,884
Unit 3	1.52	4.99	299.21	4.00	12.57	3,760	3,768
Unit 4	1.65	5.41	324.80	4.00	12.57	4,082	4,083

Shutdown	Model						PTE Calculations (30 PSIG)	Original PTE Basis (1400 PSIG)
	m/s	ft/sec	ft/min	diameter (ft)	area (ft ²)	cfm	cfm	cfm
Unit 1	4.20	13.78	826.77	2.00	3.14	2,597	2,600	82,284
Unit 2	6.11	20.05	1,202.76	2.33	4.28	5,143	5,142	162,739
Unit 3	4.89	16.04	962.60	4.00	12.57	12,096	12,087	382,546
Unit 4	5.43	17.81	1,068.90	4.00	12.57	13,432	13,443	425,469

Comment

Commenters indicated the permit should limit many other toxic pollutants, not just formaldehyde and hexane as limited in Conditions 47 and 48.

Response

DEQ regulated the toxic pollutants that were above the exemption thresholds in accordance with the applicable regulations. Pollutants with emissions below the respective exemption rates set forth in the State Air Pollution Control regulations are not subject to permitting and are not limited by the draft permit.

Chesapeake Bay Impacts and the Bay TMDL

Comment

Commenters expressed concern that DEQ did not analyze the amount of nitrogen that would be deposited in the Chesapeake Bay. Commenters also stated that emissions from BCS would violate the Chesapeake Bay Total Maximum Daily Load (TMDL) and that the State Air Pollution Control Board should require such an analysis before it considers approval of the draft permit.

One commenter provided its own modeling of the Chesapeake Bay and stated that the proposed compressor station would deposit more than 2,500 kilograms of nitrogen to the Chesapeake Bay Watershed with the bulk of that nitrogen falling in Virginia. The commenter also asserted that more than 27 kilograms would fall directly into the Chesapeake Bay and that more nitrogen would be deposited to tributaries to the Chesapeake Bay like the James River, Pamunkey River, and Dragon Run. Modeling provided in the comments was performed using the CALPUFF air modeling system.

Finally, one commenter stated that DEQ is obligated to conduct an analysis of the impacts on the Chesapeake Bay prior to issuing the permit because Virginia is a signatory to the 2014 Chesapeake Bay Agreement, which states that the federal and state governments will attain the goals of the Chesapeake Bay TMDL.

Response

It is important to note that there are no specific authorities set forth in the State Air Pollution Control law or the State Air Pollution Control regulations regarding evaluations of impacts from air emissions sources as they may relate to compliance with the Chesapeake Bay TMDL. As noted above and in response to comments elsewhere in this document, the draft permit complies with air quality laws and regulations, including air quality standards, designed to ensure protection of human health and the environment.

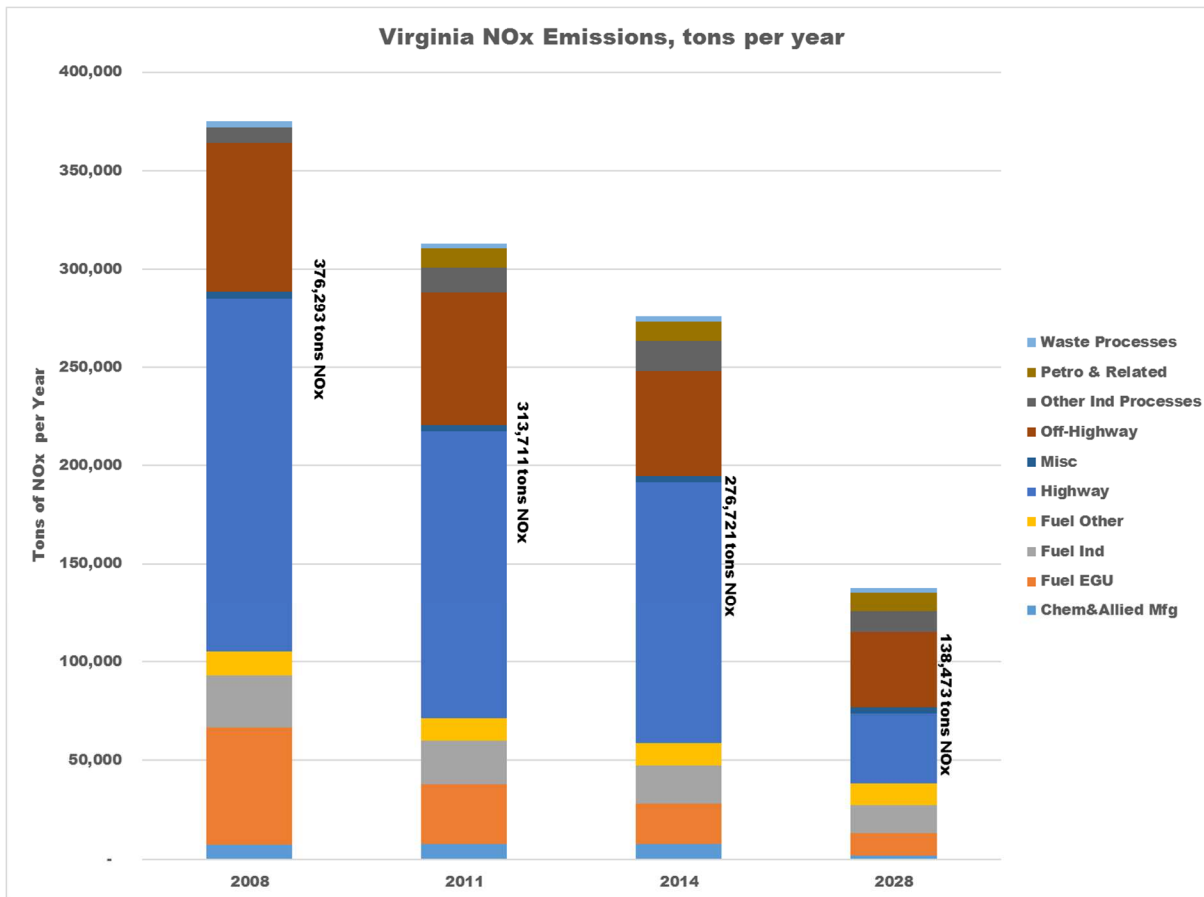
The Chesapeake Bay Program (CBP) Modeling Workgroup uses state-of-science modeling approaches that provide the foundation for the TMDL. The CBP Modeling Workgroup established the science that is accepted by all signatories to the TMDL.

The Chesapeake Bay Program has established protocols to effectively translate increases of oxidized nitrogen emissions (NO_x) from air sources throughout the Chesapeake Bay watershed to estimated nitrogen loads delivered to the tidal Bay. The latest accepted CBP modeling platform, the Phase 6 Model, has atmospheric deposition of nitrogen as one of the major nitrogen land use inputs in the watershed and as a direct load to the tidal Bay. In the case of estimated NO_x increases from the proposed compressor station, it is possible to estimate what effect that this change in emissions (34 TPY of NO_x) has on deposition loads to the watershed and tidal Bay. This can be done using information from the Phase 6 model. CALPUFF, as used by the commenter's modeler, is considered a screening tool and not as well suited to evaluate the complex chemical mechanisms associated with nitrogen deposition.

The latest guidance from the CBP states that oxidized nitrogen emissions contributions from Virginia to the entire watershed, including direct deposition to tidal water, can be estimated by applying the statewide emission percentage of 3.36%. Assuming a conservative in-stack ratio of NO₂/NO_x of 0.10 for the compressor station (i.e., NO_x emissions are 90% NO and 10% NO₂) yields a contribution of 470 kilograms, or approximately 19% of the impact predicted by CALPUFF (2500 kilograms).

DEQ remains committed to protecting these waterbodies. The Chesapeake Bay TMDL included a review of air pollution sources and determined that specific requirements for individual sources of air pollution are unnecessary since Clean Air Act regulations and programs will achieve significant decreases in air deposition of nitrogen by 2020 and beyond. EPA and DEQ believe there is reasonable assurance that those reductions will occur. The Bay TMDL reflects the expected decreases in nitrogen deposition and the federal two-year milestones will track the progress of Clean Air Act regulations and programs.

Virginia has achieved substantial reductions of NOx air emissions in recent years and this trend is expected to continue. The graph below illustrates this fact.



Greenhouse Gases

Comment

Many comments were received regarding control of methane, greenhouse gases (GHG) in general, and the dangers of climate change. Commenters indicated the permit should not be issued, or should be conditioned upon, the Governor's announcement of the consideration for regulation of methane from compressor stations and pipelines. Commenters state limits on GHG (i.e., methane) must be added to the permit.

Response

In accordance with 9VAC5-85-10, greenhouse gases are not regulated under Virginia's minor new source review program (9VAC5-80 Article 6). GHG may be a regulated NSR pollutant for the PSD permit program but the United States Supreme Court has determined that PSD permitting cannot apply solely due to emissions of GHG.

Methane emissions from the compressor station, such as natural gas venting and fugitive leaks, have been reduced by approximately 99% through this permit review through the application of BACT to the volatile organic compounds in natural gas. While DEQ has no current Article 6 regulatory authority to regulate methane specifically, reductions in methane will be realized as a co-benefit of DEQ's application of the Regulations for VOC.

Applicability of any future regulation can only be determined after the applicable regulatory process occurs. Article 6 permits do not excuse any source from compliance with any other current or future applicable requirements.

Comment

Commenters note that the application does not mention the “emission reduction devices and procedures discussed in Dominion’s Methane Management Report.”

Response

Methane is not regulated under Article 6 of the State Air Pollution Control regulations. It is unclear what activities for compressor stations the comments would consider unaddressed; DEQ's review indicates all applicable strategies are being implemented or are otherwise addressed in the draft permit. The requirements of the draft permit appear to be the most stringent requirements for compressor stations in Virginia and the country.

Source Size Designation

Comment

Commenters state BCS is a major source of air pollution and cannot be permitted as a minor source, including due to emissions of GHG.

Response

The Regulations contain many definitions of “major stationary source” that must be considered in determining applicability of specific regulations and permitting requirements. For the purpose of preconstruction permit review, the relevant definitions of “major stationary source” are contained in 9VAC5-80 Articles 6 and 8. The implementation of these definitions reference a stationary source’s “potential to emit” or PTE. Calculations related to PTE rely on requirements that are, or will be, enforceable. The draft permit contains numerous conditions that require reductions in emissions as well as limits on both the short- and long-term mass emissions. The PTE for BCS¹⁰ is calculated for the applicable programs based on the emissions after the permit and includes fugitive¹¹ and startup and shutdown emissions. The permit results in emissions of all pollutants that are less than the thresholds in the definitions of ‘major stationary source’ in Articles 6 and 8. BCS is not a major source.

Although comments suggested that the source was “major” for GHG, the United States Supreme Court has determined that the PSD program (9VAC5-80 Article 8) cannot apply solely due to emissions of GHG. In accordance with 9VAC5-85-10, greenhouse gases are not regulated under Virginia’s minor new source review program (9VAC5-80 Article 6). Methane emissions from the compressor station, such as natural gas venting and fugitive leaks, have been reduced by approximately 99% in this permit review through the application of

¹⁰ Commenters submitted calculations using different emission factors from AP-42. Usage of AP-42 emission factors is a less accurate option than emissions based on site-specific information such as vendor information for the specific equipment purchased.

¹¹ The fugitive emissions calculations included in the PTE calculations do not take any credit for reductions that are expected from the daily audio/visual/olfactory (AVO) and quarterly leak detection and repair (LDAR) requirements.

BACT to the volatile organic compounds in natural gas. While no permit limits may be written for methane specifically, the reductions have come as a co-benefit of DEQ's application of the Regulations.

Facility Siting, Special Use Permitting, and Environmental Justice

Comment

Many comments were received expressing concerns about the potential for disproportionate impacts of the proposed facility on the African American population in Union Hill. These comments were wide ranging and expressed concerns about the injustice of the compressor station site selection. Comments reference environmental justice principles and concerns about racism in the site selection. Commenters referenced the recommendations from the Advisory Council of Environmental Justice (ACEJ) as well as the Commonwealth Energy Policy.

Response

The federal Clean Air Act, the National Ambient Air Quality Standards, the State Air Pollution Control Law and the State Air Pollution Control regulations were established and designed to protect the health and environment for all people. As drafted, the proposed permit for BCS will ensure compliance with these air quality laws, standards and regulations to protect the health and environment for residents in Buckingham County and throughout the Commonwealth.

DEQ does not choose the site of a specific project nor does it approve the zoning of the site selected. DEQ does review the suitability of an activity for the area selected from an air quality perspective as discussed in the response to the site suitability comments. The emissions from the BCS were subjected to applicable provisions of the Regulations, such as the application of Best Available Control Technology to pollutants over their respective exemption rates and air dispersion modeling. Each pollutant's ambient air quality standard, either NAAQS or SAAC, are derived directly from the Regulations and apply to each person in the ambient air equally. BACT is a complex technology-based review.

As indicated in responses to other comments, DEQ has performed an extensive review of this project in accordance with Virginia's air quality laws and regulations.¹² DEQ found that if the facility is constructed and operated in accordance with the conditions of the draft permit, it will comply with all applicable air quality regulations. In fact, the resulting BACT review is significantly more stringent than other facilities permitted in Virginia. The air quality analysis is conservative and demonstrates emissions from the facility will not approach any of the applicable ambient air quality standards as permitted. The air permit process used by DEQ and the requirements contained in the resulting draft permit ensure no disproportionately high or adverse air quality impact on any resident of Virginia. In fact, the resulting draft permit is the most stringent permit for a compressor station that DEQ could identify. None of the comments submitted provided information to the contrary. Although some comments referenced the potential effect of emissions from other compressor stations on residents around those stations, they did not compare the requirements of those permits with BCS. Of specific mention, this permit creates legal requirements to minimize emissions during various blowdown events and requires emission controls. Such restrictions could not be found in other permits for natural gas compressor stations and commenters did not refer to permit restrictions at other compressor stations that would make this permit more stringent.

DEQ is concerned with air quality impacts on the citizens of Virginia, both locally and regionally. The air quality analysis and dispersion modeling performed for the Buckingham Compressor Station demonstrate that the impact from the station, in addition to the conservative background and local source population as discussed above, are below all National Ambient Air Quality Standards.

¹² Nothing in the permit process for BCS is inconsistent with the Commonwealth Energy Policy.

Executive Order 73 was issued by Governor McAuliffe and established the ACEJ. This executive order indicates¹³ environmental justice is “the fair treatment and meaningful involvement of all people regardless of race, color, faith, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” Executive Order 73 is in place to remind state agencies that no segment of the population should be left out of government processes, whether intentional or not. Where EJ issues are identified, agencies should strive to make an extra effort to reach residents.

As part of its outreach on this project and in addition to the regulatory comment and hearing process, DEQ staff met with residents and community leaders in the area during the permit review process to provide information and answer questions to help inform residents on the process. This included a presentation to the ACEJ and members of the public on May 30, 2018 regarding the then-current status of the application review. This meeting was held in Buckingham County with many residents attending. A brief amount of time was allotted by the organizers so DEQ could answer questions from the Council after the presentation. To further the understanding of the residents of Buckingham County and increase participation in the public comment process, DEQ held a 2-hour meeting with a small group of active residents of the Union Hill area and Yogaville as well as taking a 2-hour tour of the location with several active residents on the afternoon of August 16, 2018. Attendees included residents who lead the various local groups of residents opposing the BCS. The meeting provided these leaders an opportunity to voice the concerns and ask questions on behalf of the residents they represent. DEQ also held a public informational briefing on the evening of August 16, 2018 open to any interested person. The briefing consisted of an approximately 30 minute presentation on the draft permit and basic terms and technical aspects related to the BCS. A 1.5 hour question and answer session followed that presentation where members of the public could ask questions regarding any aspect related to the draft air permit. DEQ has attempted to further this approach by attempting to answer many general questions submitted by Friends of Buckingham that do not actually request changes to, or identify deficiencies in, the draft permit. DEQ also created a specific webpage for BCS, including information on topics that are not within the purview of this action; links to the agency/entity responsible also were provided. Many questions regarding the process or other information were used to add or clarify wording on the website to continually improve the public’s understanding.

Lastly, it is important to note that BCS has undergone dispersion modeling to identify the impacts and compliance with the ambient air quality standards. The requirements of this draft permit are the most stringent requirements for a natural gas compressor station that DEQ could find.

Comment

The draft permit should not be issued until after the conclusion of the lawsuit regarding the Buckingham County Special Use Permit (SUP).

Response

The filing of a lawsuit by itself does not invalidate the SUP. The facility currently has a legally valid SUP in that no court has invalidated the SUP nor has an injunction been issued by a court. Buckingham County has informed DEQ that the proposed facility is consistent with all ordinances adopted pursuant to Chapter 22 of Title 15.2 of the Code of Virginia. Therefore, DEQ has a complete application and must proceed with the process to provide the Board a proposed permit for their consideration and final determination. If, in the future, a court invalidates the SUP or issues an injunction, the facility would have to follow the applicable laws and authorities and if the facility could not be zoned properly, the facility could not be constructed regardless of any air quality permit issued by DEQ. DEQ received a complete application and drafted a permit that complies with all applicable air quality regulations.

¹³ EO-73 states that this is the definition of EPA, indicating this definition is informative in Virginia.

Comment

Many comments indicated the Board must consider the suitability requirements laid out in 10.1-1307 E of the Code of Virginia and 9VAC5-170-170. Comments indicated the Board has jurisdiction to correct the perceived errors in the local zoning and FERC processes via the suitability requirements laid out in 10.1-1307 E of the Code of Virginia.

Response

Virginia's laws empower local governments to establish zoning ordinances governing land use within their jurisdiction (Title 15.2, Chapter 22 of the Code of Virginia). Section 10.1-1307 E of the Code of Virginia and 9VAC5-170-170 set forth provisions regarding site suitability within the purview of the state air pollution control laws. In considering site suitability, DEQ gives significant weight to decisions by a local governing body as to the general suitability of a proposed new facility or expansion of an existing facility and will approve or disapprove a permit application within the context of air quality considerations. DEQ does not consider it appropriate for the air permitting process to become a step in the appeal process for individuals who wish to challenge local government decisions concerning planning and zoning. DEQ's review of suitability is relevant to the air quality impacts of the proposed activity and proper implementation of the air quality regulations issued under the Board's authority in Title 10.1, Chapter 13 of the Code of Virginia.

Many comments indicated DEQ must consider the provisions of §10.1-1307E of the Virginia Code and 9VAC5-170-170. Some comments noted DEQ's Section X of the analysis document but then indicated that DEQ did not consider the suitability of placing BCS in the Union Hill community. Section X considered the specific location of the compressor station and found the site suitable. Comments also referenced a disproportionate impact faced by the community that lives within a mile of the proposed compressor station. This comment mixed the concept of environmental justice as discussed above with the requirement to determine site suitability. The comment also did not address DEQ's finding that the emissions are within all applicable air quality standards and that the draft permit is the most stringent air permit for a natural gas compressor station that DEQ has found. Commenters have not identified any more stringent permits for natural gas compressor stations. Comments indicating DEQ did not consider the local population are not correct. The air quality analysis considered the impacts of the emissions after the draft permit in the ambient air, where any member of the public may be located, not just the community of Union Hill¹⁴. The results of the air quality analysis demonstrated compliance with all applicable air quality standards.

The activities regulated in this permit have been evaluated consistent with applicable air pollution control laws and regulations, including 9VAC5-50-260 (BACT) and 9VAC5-80-1180 (Standards and conditions for granting permits), and have been determined to meet these standards for limiting air pollution where applicable. DEQ has required the applicant to conduct modeling for all relevant criteria pollutants and toxic pollutants to determine the impacts from the facility. The modeled air quality impacts from the facility are in compliance with all applicable air quality standards designed to ensure protection of public health and the environment.

DEQ considered the Buckingham County Board of Supervisors and the Federal Energy Regulatory Commission approval of this facility as determining the project is socially and economically desirable and needed. The Buckingham County Board of Supervisors issued a SUP on January 5, 2017 that limited the non-air quality impacts of the facility. FERC issued an order issuing certificates of public convenience and necessity on October 13, 2017. FERC's review considered a wide range of impacts of the entire pipeline, including BCS and its air quality impacts. FERC noted that all impacts are reduced to acceptable levels. The draft permit has

¹⁴ Commenters reference an informal survey of residents in the Union Hill community. This survey results in 52.6 people per square mile, which is higher than the U.S. Census data. However, this slight difference in population density does not alter the results of DEQ's review.

significantly restricted BCS' emissions beyond those considered by FERC or the Buckingham County Board of Supervisors, such as the lower NOx and CO emission limits, less venting from turbine startups and shutdowns, and capped emergency shutdown tests. DEQ has also conducted a more detailed air quality modeling analysis of the emissions from BCS. In consideration of the draft permit requirements and the minimal air quality impacts, DEQ has identified no reason to disagree with their findings that the activity is socially and economically desirable.

As noted in the analysis for the draft permit in Section X, DEQ has reviewed the available data and found the site suitable. DEQ's review of the available information after receipt of public comment finds no impacts that would render the selected site unsuitable for the proposed BCS operating in compliance with the requirements of the draft permit.

Best Available Control Technology (BACT)

Comment

Some comments suggested that the BACT determination for NOx emissions from the facility is incorrect. Commenters suggested that better control efficiencies were "achievable and cost effective." Commenters state the DEQ must consider sources outside of Virginia as well as sources in the power generation industry.

One commenter questioned if DEQ could provide proof the emissions are being controlled at the application's assumed efficiencies. The commenter is concerned because the permits for the West Virginia and North Carolina compressor stations state lower levels of efficiencies for the same type of turbines. The commenter also indicates there is no mention of a standard maintenance plan or equipment review process to make sure the emission control equipment is functioning correctly and consistently. Commenter expressed concern that if these emission controls fail for any reason, emission levels will increase.

Response

Many comments indicated that better control was "achievable and cost-effective." No data were provided, however, for DEQ to consider regarding how to revise the draft permit and what level of control would meet BACT pursuant to these comments.

*One commenter provided specific suggestions for BACT but identified power production facilities and natural gas compression facilities as similar sources in the analysis. However, the final sentence in the definition of BACT in question (9VAC5-50-250C) is, "In determining best available control technology for stationary sources subject to Article 6 (9VAC5-80-1100 et seq.) of Part II of 9VAC5-80 (Permits for Stationary Sources), consideration shall be given to the nature and amount of the emissions, emission control efficiencies achieved **in the industry for the source type**, total cost effectiveness, and where appropriate, the cost effectiveness of the incremental emissions reduction achieved between control alternatives."(emphasis added) Power generation and natural gas compression facilities are not in the same industry; therefore, such a comparison as suggested in the comments is not appropriate¹⁵.*

The application demonstrated the cost effectiveness for SCR at BCS is approximately \$30,000 per ton. DEQ has never considered such a value to be cost effective for any industry, even in a top-down BACT review in the major new source review program. In fact, DEQ has consistently considered BACT from natural gas compressor stations to be no control and a value of 15 ppm NOx as an emissions limit. ACP proposed SCR technology at BCS; therefore, DEQ did not consider the cost effectiveness of the technology in the draft permit.

¹⁵ In addition to the regulatory requirement mentioned here, the cited facilities are not comparable. All cited turbines utilize water injection or a 'wet' technology to reduce NOx formation. BCS utilizes a dry system. The turbines cited by commenters also have considerably larger turbine ratings, with the smallest being more than 4 times the size of the largest turbine at BCS.

However, further reducing emissions of NO_x will increase the cost of the SCR systems. Given the low total emissions from this facility, the already high costs associated with the SCR system, and the lack of evidence of a more stringent permit limit for natural gas compressor stations in the country, DEQ does not consider a further reduction in NO_x emissions cost effective for BCS.

As delineated in the draft engineering analysis, DEQ reviewed permits for this industry type and has determined that the BACT limits for NO_x in the draft permit are the most stringent limits for natural gas compression stations.

The commenter's concerns regarding the control efficiencies are addressed by using numeric emission limitations in Conditions 20 through 23, which are based on the application's assumed control efficiencies. The differences between the West Virginia and North Carolina permits are because BCS' draft limits are lower than the other states' limits after applying Virginia's BACT requirement. Condition 41 requires BCS to develop and implement a maintenance plan.

Comment

Electric turbines must be considered as an alternative to natural gas combustion turbines to ensure the "maximum degree of emission reduction for any pollutant."

Response

The application of BACT for Article 6¹⁶ reviews the affected emission unit(s) that is part of the facility proposed by the source. DEQ has determined that wholesale replacement of a natural gas turbine (the affected emission unit) for an electric turbine (a completely different process unit with a different energy source) constitutes redefinition of the source and is not considered in Virginia's BACT determination for BCS¹⁷. DEQ reviewed permits for this industry type and has determined that the BACT limits for NO_x in the draft permit are the most stringent limits for natural gas compression turbines. The draft BACT determination for NO_x remains unchanged.

Comment

Commenters stated that the BACT review was inappropriate because scrubbers can remove PM and must be required.

Response

BACT in 9VAC5-50-260 is a review of the maximum degree of reduction for a pollutant from an affected emission unit considering reductions **achieved in the industry for the source type**. In DEQ's review, no compressor station turbines could be found where scrubbing, or any other, technology was required for particulate matter other than the BACT determination for BCS requiring inlet air filters. Commenters did not identify a single natural gas combustion device employing scrubbing technology for particulate matter. The draft BACT determinations for particulates remain unchanged.

Comment

Commenters requested that catalytic combustion be considered for BACT for the compressor turbines. Commenters stated at least one of the SOLAR turbines has demonstrated successful use of the technology.

¹⁶ The comment references the federal Environmental Appeals Board determinations and EPA guidance. These types of references must be considered in a delegated state's PSD review; however, this draft permit is a Virginia-specific minor new source review action. As noted in the draft analysis provided with the draft permit, an Article 6 BACT determination is a comparison of similar facilities in Virginia.

¹⁷ Natural gas also provides a consistent source of fuel as the pipeline operation provides the fuel needed. Electricity would be subject to grid issues such as power outages and other similar interruptions that would hamper operations at the site.

Response

Comments asserted a SOLAR turbine uses the technology but no information was submitted and DEQ could find no compressor stations that utilize this technology. As noted in the May 25, 2018 BACT analysis submitted by ACP, catalytic combustion is not a commercially available technology. Technologies that cannot be readily purchased and have not been demonstrated in practice are eliminated from consideration as BACT. DEQ continues to believe the requirements of the draft permit are the most stringent requirements for compressor stations in Virginia and the country.

Comment

Commenters note that emissions of SO₂ and HAP seem to be higher in 2018 than in 2017 and asserted this cannot be BACT.

Response

During the application review process many details were revised based on new information or based on DEQ's request. The SO₂ emissions for the turbines were revised when DEQ noted that the sulfur content of the gas that served as the basis for the 2017 emission estimates was too low based on data submitted to DEQ for other projects. ACP revised their application from a maximum sulfur content of 1.1 gr/100 dscf (from 0.6 gr/100 dscf), which is now a permit limit. The HAP emission estimates were revised many times for a variety of reasons, including changes to the venting events at the facility, new data from the turbine manufacturer, and a change to the emergency generator's annual hours of operation, which inappropriately used 100 hours instead of 500 hours. In making the draft BACT determination, DEQ considered the new emission rates. DEQ could not identify any changes that would affect the BACT determinations for formaldehyde and hexane contained in the draft permit.

Comment

Commenters indicate that DEQ relied on the top-down analysis for other smaller sites and suggested that a new top-down analysis is needed as BCS is larger.

Response

A top-down analysis is a specific procedure for making a BACT determination used by EPA and many states in major new source review permit decisions. DEQ did not perform top-down BACT analyses for this draft permit. DEQ performed a BACT review for BCS based on the emission units proposed for this compressor station. DEQ's review considered other compressor stations in the state regardless of size. DEQ reviewed other permits across the country for natural gas compressor stations of all sizes and did not find any limits more stringent than those in the draft permit. DEQ did not find compressor stations of any size with the types and number of limits regarding venting events contained in the draft permit. DEQ did not receive any contrary information during the public comment period.

Comment

Commenters requested the permit contain requirements for proprietary control technology (pig ramps apparently designed by MarkWest) that is expected to be made public in accordance with a consent order between EPA and the company.

Response

DEQ could not find any plans regarding the use of 'pig ramps' other than a copy of the consent order with EPA with a general requirement to make the plans available. The commenter did not quantify any emission reductions that would be achieved from use of this technology, any costs associated with this technology, or a description of how this technology works. A BACT review is performed based on available information at the time of the action and is not an on-going review requiring new technologies as they become available in the

future. DEQ has no information on this control technology or the cost, reductions, or cost effectiveness that would be necessary to make an educated determination regarding this technology. The permitted annual emissions from all pigging events at BCS are 0.63 tons of VOC and less than 0.077 tons of hexane. No change has been made to the permit.

Comment

Commenters asked about comparisons to the other compressor stations along the ACP. Commenters were also concerned about future expansion of BCS.

Response

The two compressor stations referenced in the comments are different sizes and are subject to regulations in the respective states; therefore, a comparison of mass emission rates would not be appropriate. Additionally, states have different regulatory authorities and requirements (e.g., unlike Virginia, not all states implement BACT for minor sources) making comparison inappropriate.

In Virginia, a minor new source review permit is issued for a new stationary source or project that does not meet the exemption criteria contained in the Regulations. While regulations may be different in the future, the draft permit does not expire. The BACT requirements as well as the associated monitoring and recordkeeping will continue to apply. Future projects are a hypothetical situation that is difficult to discuss accurately. Permit applicability depends on many specific details that cannot be reasonably captured in this response to comments document.

Monitoring and Reporting in the Permit

Comment

Some comments suggested that continuous emission monitoring systems (CEMS) should be required. Comments indicated there are no requirements for monitoring and there are no other ways to determine that the turbine and SCR are operating correctly during the various operating scenarios as well as the total emissions per year.

Response

CEMS are one way of determining compliance with emission limitations; however, they are not required for lower emitting units. Some comments assert that no on-going monitoring is included in the permit. These assertions are inaccurate. Although the draft permit does not require CEMS, it contains numerous monitoring requirements related to the operation of both the turbines and their respective SCRs. The monitoring requirements are to continuously monitor and record various process parameters associated with the turbine or the SCR. Conditions 8, 9, and 13 delineate these requirements. The values of these parameters are determined during the stack testing required in Conditions 29. These values are re-evaluated and adjusted if necessary during the bi-annual testing required in Condition 31.

Annual emissions are based on the many limitations in the permit for the various operational scenarios. The draft permit contains many different provisions that when taken as a whole, limit the annual emissions of each pollutant in a manner that is practically enforceable.

By staying within the ranges for the continuous parametric monitoring as well as staying below the annual operating limitations, BCS will demonstrate continuous compliance with the emission limits in the permits.

Comment

Commenters requested that BCS notify the public and/or emergency response personnel prior to a planned venting event to allow for residents to leave the area. Residents also wished to know when it was safe to return after such an event.

Response

DEQ's review of the application and the resulting draft permit comply with all applicable ambient air quality standards, including during venting events, which are restricted well beyond any requirements in other permits that DEQ or the public identified. Community notifications are not warranted. No change has been made.

Comment

Commenters assert that the draft permit should require more reporting of the various monitoring records. Commenters feel that Condition 36 is not stringent enough. Some commenters suggested that all records required in the permit must be maintained by DEQ and should be made available to the public in a format that would not require requests for information pursuant to the Freedom of Information Act (FOIA).

Many commenters requested submission of records and reports to DEQ. Some comments stated that all records must be sent to DEQ and made available to the public, possibly in real-time.

Response

Condition 36 was written to ensure DEQ compliance staff received regular updates on the activities at this facility. Compliance staff can review these reports, ask questions of the source, ask for records from the source, or perform a site visit and review records at the facility. This is a standard practice in determining compliance with any facility. Detailed reporting and/or submission of extensive records does not further compliance determinations and requires DEQ to expend additional funds to pay for the required storage space for these records. The reporting requirements in Condition 36, that require BCS to certify their compliance with all requirements semi-annually is similar to a Title V semi-annual report required for major air emissions sources and is sufficient to ensure compliance with the applicable requirements of the permit and other regulations.

Monitoring by the source is one underpinning of the federal and state air programs to ensure that program resources are utilized in the most efficient and effective means. Monitoring by emissions sources, including Dominion, has been used for many years and has worked to ensure on-going compliance with requirements and continuing reductions in air pollution. The Regulations are clear that willingly falsifying records can be a criminal offense.

DEQ required semi-annual reporting of compliance status at BCS in Condition 16. This is more stringent reporting than many, if not all, sources of similar size in Virginia. The type of reporting allows DEQ to maintain oversight without excessive expenditure of resources. For example, DEQ must maintain all records submitted. This includes paying for storage space. This type of excessive reporting is unnecessary given the source's size and DEQ's on-going authority to inspect BCS to ensure compliance with all air regulatory requirements. No change has been made.

Comment

Commenters requested stack testing for SO₂ emissions from the turbines.

Response

Condition 15, in defining the fuel allowed at the site, limits the potential available sulfur that could be converted into SO₂ emissions from combustion of the gas. Conditions 16 and 36 require testing and records of the sulfur content. As described in the draft engineering analysis, the uncontrolled SO₂ emissions from the entire facility are 8.3 tons per year, which is less than the exemption rate of 40 tons per year contained in

9VAC5-80-1105C. BCS' SO₂ emissions are not subject to Article 6 permitting or BACT. Emissions testing from each turbine is not required for these reasons.

Comment

Dominion commented that Condition 36.b references continuous emission monitors; however, the permit requires continuous parametric monitoring. Dominion requested a change from emission to parametric.

Response

The permit has been changed to more accurately describe the monitoring referenced.

Comment

Dominion commented the permit requires monitoring of minimum pilot mode but that "SoLoNOx mode" is the appropriate nomenclature for the permit.

Response

The change is accepted. The permit requires BCS to operate and monitor SoLoNOx mode. Additional records are required to ensure BCS maintains documentation from the turbine manufacturer for all parameters and their ranges that are relevant to the SoLoNOx mode determination.

Fugitive Equipment and Venting Events

Comment

A comment suggested that fugitive emissions requirements should not be linked to the federal regulations contained at 40 C.F.R. 60 Subpart OOOOa. The comment further suggested that this should include a definition of "fugitive emissions components" directly in the permit.

Response

The draft engineering analysis, as noted in the comment, discusses the authority for the draft permit condition. The clarification of the authority was provided in the draft analysis to help clarify that there is no federal interaction with these limits (i.e., federal action on the New Source Performance Standard (NSPS) would not relax the permit requirements). This is further noted in the draft permit as the regulatory authority for the condition is BACT and Article 6 and does not contain any reference to the NSPS.

A reference to the definition of 'fugitive emissions component' is an acceptable approach to incorporating a complex topic with much regulatory text and does nothing to change the authority of the condition. No change has been made in response to this comment.

Comment

One commenter suggested that the time to repair leaking components should be reduced. The commenter asserted that the time allowed for repairing leaking components is excessively long and a justification must be made why the selected time period is the shortest possible time. Commenters suggested repairs should be made within 24 hours to 2 days of discovery with final repair within 3 to 7 days.

Response

DEQ conducted a review of available permits as well as the applicable NSPS OOOOa to determine an appropriate timeframe for repair. The NSPS only requires quarterly leak detection and repair (LDAR) surveys. In the NSPS, when a leak is found sources have 30 days to complete repairs. There is no timeframe for initial attempt other than "as soon as practicable." The draft permit requires daily audio/visual/olfactory (AVO) surveys and quarterly LDAR surveys and provides for both a minimum initial attempt within 5 days and repair within 15 days. DEQ also reviewed permits for similar sources and found no requirements for daily AVO

surveys or repair provisions that were more stringent than NSPS OOOOa. DEQ has reviewed the available information and has determined the draft permit requirements for fugitive leak surveys and repair appear to be the most stringent for natural gas compressor stations in Virginia and the country. The comments submitted did not identify more stringent requirements. The BACT determination for fugitive leak components remains unchanged.

Comment

Some commenters questioned how many blowdowns would occur annually at BCS. Commenters also asked if bypass pipes were being used to prevent blowdowns.

Response

'Blowdown' is an industry term which refers to natural gas being vented somewhere at the facility for some reason. DEQ has tried to clarify this aspect of BCS draft permit conditions by using the term 'venting event.' For the purpose of the draft permit for BCS, only three venting events are allowed: those due to maintenance on a turbine when a turbine is shutdown (10 startup and 10 shutdown for each turbine); pig launching and receiving (15 each per year for the entire facility); emergency shutdown (ESD) testing ('capped' testing only). Venting events that occur due to turbine startup and shutdown and combustion emissions while a turbine is starting up or shutting down are different activities. A turbine may startup and shutdown 100 times in a year but only 10 of those may vent natural gas.

Bypass pipes allow for continued operation of the station while pieces of equipment are not operating. These pipes do not reduce emissions at the facility. The vent gas reduction system is being used to reduce emissions from turbine shutdowns.

Comment

Commenters noted the application contained assumptions regarding the operation of the facility with respect to emissions of hexane from venting events.

Response

The application used the best available information to calculate the emission rate of hexane, including testing from facilities that use similar natural gas and the engineering expertise of Dominion, such as pressure loss experienced when pushing the pig through a pipe. These assumptions are enforceable via the draft permit that contains emission limits for hexane from the various venting events. The draft permit also requires BCS to calculate emissions and maintain supporting documentation for those calculations, which can be reviewed by DEQ to ensure compliance.

Other Comments on the Draft Permit

Comment

Commenter indicated that the permit does not prohibit operation of the turbines below 50% capacity except during periods of startup or shutdown. The commenter requested additional wording prohibiting such operation.

Response

The commenter is correct that the SoLoNOx system does not operate below 50% load and the emissions increase if a turbine is operated in that manner. Condition 1 provides for operation of the turbines without SoLoNOx in only two scenarios: startup and shutdown. When the inlet air temperature is less than 0°F there is a diminishing effectiveness of the SoLoNOx system; therefore, the condition also provides that SoLoNOx must operate to the maximum extent possible with the understanding that in extreme temperature scenarios the SoLoNOx system will not operate at all. This is important to ensure BCS must minimize emissions to the extent

possible during those scenarios. Therefore, the scenario outlined by the commenter (i.e., operation below 50% load not in startup or shutdown and in non-SoLoNOx mode)) is prohibited. This is further illustrated in that the emission limits in Conditions 20 through 23 do not exclude operation below 50% load not in startup or shutdown and in non-SoLoNOx mode.

Comment

A commenter indicated that startup and shutdown emissions must be limited for each turbine as the VOC emissions are limited.

Response

It appears the commenter references the limit on the emissions of VOC from natural gas venting events due to shutdown and startup of the turbines. There are no combustion emissions from those venting events, as the turbine is not operating. Combustion emissions from startup and shutdown from the turbines are included in the compliance demonstration for the annual limits for each pollutant.

Comment

A commenter suggests that emission limits be set to apply during periods when the inlet air temperature is less than 0°F.

Response

Emissions limits during the described operating conditions were included in the draft permit that was the subject of this comment period in Conditions 20 through 23.

Comment

Commenters noted that the equipment table in the Introduction of the permit is clearly marked as not an enforceable term of the permit. Commenters suggested that the list of equipment in the permit, as well as the capacity of the equipment, must be an enforceable portion of the permit.

Response

The equipment table is a listing of the equipment that was reviewed and approved. It provides DEQ compliance inspectors with information to quickly recognize if a source has changed or added equipment.

The equipment table provides reference numbers for units that are used in the conditions of the permit. There are many limitations in the draft permit that are enforceable via the required monitoring, testing, and recordkeeping. The limits in the permit do not rely on the equipment table to be enforceable. Therefore, in accordance with 9VAC5-80-1180D, there is no need to make the equipment table a legally enforceable portion of the document.

Comment

Commenters stated that the permit review is deficient because it relies on manufacturer's emissions data, which in some cases is annotated as not being warrantied. Commenters suggested that emissions may change based on the specific location in Buckingham County. Commenters asked how wind chill would impact emissions. One commenter suggested the use of the sentence, "Compliance with these limits may be determined as stated in Conditions..." was problematic.

Response

The permit contains many limitations, including numeric emission limits, for the pollutants subject to permitting pursuant to Article 6. While these terms may have been initially calculated using data from manufacturers or vendors, the limits in the draft permit are enforceable at BCS without regard to warranties, or a lack thereof, from any particular manufacturer/vendor. Once permit limits are established, a lack of warranty, or a

warranty based on ISO conditions, is not a defense for non-compliance with permit limits. The draft permit has several initial and on-going testing requirements, as well as on-going continuous parametric monitoring, to ensure the equipment continues to meet the emission levels that serve as the basis for DEQ's review of the application. These requirements apply to the site-specific emission units when operated at the site.

Wind chill is the lowered temperature of an object due to convective cooling. With respect to air pollutant emissions at BCS, wind chill is not relevant; the inlet air temperature in the turbine is the relevant factor.

The sentence used in the emission limits (Conditions 20 through 23, 47, and 48) are used to show how, on an on-going basis, compliance with the conditions may be indicated. The word "may" is correct because DEQ does not want to limit compliance determinations or appear to preclude the use of credible evidence.

Comment

Commenters stated portions of Conditions 1, 4 (introductory paragraph and subsection e), and 6.e are unenforceable because of language referencing the use of plans or activities for minimizing emissions. Commenters also expressed concern that "sufficient differential pressure" in Condition 6.e was unenforceable.

Response

Condition 1 requires the SoLoNOx system to be operated at the maximum extent possible when the inlet air temperature falls below 0°F. This language is used in lieu of, and is more stringent than, a blanket exemption because there is a sliding scale of operation of the SoLoNOx system in these cold temperature scenarios. It is inappropriate to allow BCS to emit at rates above the best operation of the SoLoNOx system. This condition is enforceable because the source maintains documentation from the manufacturer regarding the operation in these scenarios which the DEQ staff can review and determine the appropriateness of the practices. Requiring this type of documentation also provides an avenue for the manufacturer to develop better practices in the future that may be immediately implemented by the source. Requiring a source to obtain a permit amendment prior to implementing a work practice that reduces emissions of pollutants is contrary to the requirement for minimizing emissions.

The introduction to Condition 4 replicates the language of the requirement for minimizing emissions (9VAC5-50-20). The subsections go on to delineate the minimum requirements for minimizing such emissions. DEQ staff may use this general language to take action where a source does not maintain documentation of the appropriateness of their actions to minimize emissions. Subsection e of Condition 4 makes it clear that while it is unexpected the control devices will operate during startup, and for the SCR during shutdown, the source must maintain documentation that they are running the control devices to the maximum extent possible. This documentation can be reviewed by DEQ staff to confirm adequate actions are being taken.

Subsection e of Condition 6 requires 'sufficient differential pressure' be maintained by the vent gas reduction system (VGRS). Subsection d of Condition 6 defines the phrase 'sufficient differential pressure' as the pressure determined during the testing required in Condition 34. Requiring a specific numeric value at this time is premature as the results of the testing will provide the numeric value that must be maintained and will be accurate for each turbine.

Comment

A commenter suggested that the definition of startup and shutdown in Conditions 4.a and b. is inappropriate. Comments also suggest that the reliance on 50% load is inappropriate and should be much smaller.

Response

The SoLoNOx system operates at loads at or above 50%. Below this load the system does not operate properly; therefore, startup ends and shutdown begins when the SoLoNOx system can properly operate. Emissions from the turbines based on their rating during these periods has been considered.

Comment

A commenter indicated the minimum operating temperature for the oxidation catalyst contained in Condition 2 is not justified and should be the widest range possible.

Response

The comment does not identify an error in the value. The minimum temperature for operation contained in Condition 2 is to ensure the catalyst is sufficiently warm to achieve the reductions in CO, VOC, and formaldehyde during operation including shutdown. To include a lower temperature would be less stringent as it would allow the catalyst to be operating for the purpose of this permit, demonstrating compliance with the requirements of Conditions 2 and 47. Combustion gases will always pass through the catalyst, achieving whatever efficiency may be achieved at lower temperatures. Implementing the proposed approach of using the lowest possible temperature would be less stringent. The comment did not identify, nor has DEQ found, any compressor station with more stringent limits.

Comment

Commenters noted the permit does not regulate emergency situations such as explosions.

Response

DEQ's authority pursuant to the applicable air quality laws and regulations address those operations that are expected during the course of normal operation of a unit or facility. Accidents and emergencies are not normal operations and are therefore not limited in the draft permit. Not only would accurately quantifying the emissions from an unknown future emergency be impossible, any excess emissions due to negligence would be addressed as violations.

Comment

One commenter requested the following conditions be added to the permit:

Condition 1: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee expressly agrees to indemnify and hold harmless the Virginia Department of Environmental Quality, its representatives, employees and agents ("DEQ") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the compliance permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in any compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEQ's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEQ and arising from any citizen suit or civil rights provision under federal or state laws.

Condition 2: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the law as those prescribed for the permittee.

Response

These conditions are unnecessary to the proper implementation of regulations. The owner of BCS is responsible for compliance with the air permit and regulations at the site, regardless of whether a company employee or contractor performs the action.

Comment

Commenters requested ammonia or ammonia slip to be regulated in the draft permit. Commenters also inquired why the ammonia storage tank increased in size.

Response

Ammonia is not a regulated pollutant in Virginia. It is neither a toxic pollutant nor a precursor to PM2.5 for BCS. Ammonia limits are beyond the authority of this draft permit.

The storage tank increase in size is due to the lower NOx limitation requiring additional ammonia usage and more on-site storage of ammonia for use in the NOx emissions control equipment.

Comment

Commenters proposed the following specific language for the permit:

- Under Process Requirements, Condition #7, Emission Controls, please add this subsection:
 - e. Daily audio/visual/olfactory (AVO) observations will be recorded including the date and the full name of the observer who conducted the inspection/reading.
- Under Operating Limitations, Condition #14: change so that a change in fuel WILL (not "may") require a new or amended permit.
- Under Operating Limitations, Condition #14: in "test results shall be submitted to the Piedmont Regional Office no later than 60 days after test completion" change 60 days to 7 days.
- Condition #17 states, "Operating Hours – The emergency engine (EG-01) shall be operated for the purposes of maintenance, testing, and emergencies (as defined in 9VAC5-80-1110C) only. The emergency engine (EG-01) shall not operate more than 500 hours per year, calculated monthly as the sum of each consecutive 12-month period." The relevance of the definitions given in 9VAC5-80-1110C at <https://lis.virginia.gov/cgi-bin/legp604.exe?000+reg+9VAC5-80-1110> are very obscure. This permit condition should be clearer about maintenance and testing requirements and schedules for the emergency engine. Please state clearly the number of events of venting of emissions that are allowable, given the required maintenance and testing of the emergency engine.
- Under Testing, Condition #29: in "The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after startup..." change 60 days to 7 days, and change 180 days to 21 days. Also, in "One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after startup..." change 60 days to 7 days, and change 180 days to 21 days.
- Under Testing, Condition #30: as in the suggestions for Condition #29 above, change the time limits from 60 and 180 days to 7 and 21 days.
- Under Testing, Condition #31: change from repeating the tests "every two years" to "yearly." Change "no later than 26 months" to "no later than 12 months." Change "no later than 60 days after test completion" to "no later than 7 days after test completion."

- Under Testing, Condition #32: change "or 36 months, whichever is earlier" to "or 12 months, whichever is earlier." Change "no later than 60 days after test completion" to "no later than 7 days after test completion."
- Under Testing, Condition #33: in "The initial test shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after startup of the permitted facility" change 60 days to 7 days, and change 180 days to 21 days. Similarly, in "One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after startup..." change 60 days to 7 days and 180 days to 21 days.
- Under Testing, Condition #34: in "The initial evaluation shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after startup ..." change 60 days to 7 days, and change 180 days to 21 days.
- Under General Conditions, Condition #43: in "within 14 days of discovery of the malfunction," change 14 days to 3 days.
- Under State-Only Enforceable (SOE) Requirements, Condition #49: similar to Conditions #29 and #31, change, in both occurrences, 60 days to 7 days, and 180 days to 21 days.
- Under State-Only Enforceable (SOE) Requirements, Condition #50: similar to Conditions #30 and #32, change, in both occurrences, 60 days to 7 days, and 180 days to 21 days.

Response

The requested changes are addressed as follows:

- *Condition 7.e – Records of the AVO results are required. The full name of the person performing the observation is not necessary for determining compliance with the requirement.*
- *Condition 14 – The regulations do not require all changes at facilities to undergo permitting; therefore, the use of ‘may’ is appropriate. The determination of need for a permit will be based on the regulations in effect at the time of the change.*
- *Condition 14 – This proposed change appears to actually refer to Condition 16. Test results take time to analyze and report, with 60 days being the standard amount of time allowed to analyze this type of data and prepare and submit the report.*
- *Condition 17 – The regulations define the circumstances that are emergencies and qualify for engine operation. There are no venting events from the emergency engine.*
- *Conditions 29, 30, 33, 34, 49, and 50 – The timeframes provided in the draft permit are those provided in the applicable regulation, 9VAC5-50-20.*
- *Conditions 31 and 32 – The time in between testing is reflective of the timeframes in the applicable NSPS and is appropriate for on-going testing. The test results take time to analyze and then prepare and submit the report, with 60 days being the standard amount of time allowed.*

- *Condition 43 – The notification of malfunction is a direct requirement from the applicable regulation, 9VAC5-20-180*

Regardless of the reporting requirements in the draft permit, the regulations require facilities to notify DEQ within 4 hours of discovery of excess emissions. Reporting templates are provided to sources to ensure the data DEQ needs to review is contained in the report.

The draft permit was not changed in response to these comments.

Comment

Commenters questioned whether the emergency gas turbine would create higher emissions, specifically in winter months. Commenters expressed concern about how this was addressed in the draft permit.

Response

The comment appears to refer to the emergency engine that is fired on natural gas. “Emergency” operation is delineated in the regulations (9VAC5-80-1110) and this draft permit. Emergencies such as power loss at the facility would not be specific to a particular season. The engine is not used to provide pressure to the pipeline but is used to provide emergency power to the facility for operational continuity. The emergency engine is limited by several conditions in the draft permit. The main purpose of the emergency generator is to provide power to the station to continue operations. In the event of a power loss, the generator is designed to start and maintain sufficient power such that the turbines do not have to shutdown.

Comment

Some commenters expressed concern that the draft permit has already been approved and transmitted to ACP.

Response

For any permit action subject to public comment, the draft permit cannot be finalized until DEQ considers all comments received. Draft permits are shared with applicants prior to final permit issuance to provide the source an opportunity to understand the conditions prior to final issuance. For BCS, the Director determined prior to the comment period that the Board would determine the final disposition of the permit action. Final disposition of this draft permit will be determined by the Board at a meeting of the Board.

Comment

A commenter requested changes to the permit as follows:

- Condition 7(b): After sentence 4, insert a sentence stating that if difficult to repair leaks are small enough to defer repair, then they should be repaired the next time the facility is shut down (unless delaying the repair would result in greater emissions than would result from facility shutdown): “If a leak is found that will emit less natural gas than a facility shutdown, its repair may be delayed until the next facility shutdown unless the summed aggregate of delayed repair natural gas emissions would exceed the natural gas emissions of a facility shutdown.”
- Condition 16: Fuel Monitoring - Should be modified to ensure that ACP is periodically measuring VOC composition and concentrations in gas flowing through the facility, as this is the gas that will be leaked or released as fugitive and venting emissions.
 - Replace sentence 2 as follows: “The permittee shall perform annual fuel analysis of on-site natural gas. The details of the tests shall be arranged with the Piedmont Regional Office. Tests shall identify, at a minimum, VOCs typically reported for EPA methods TO-15 or TO-17 for VOC analysis, and use similar or better reporting limits.”
- Condition 51 should read “each venting event” not “any venting event.”
- Condition 51 should read “Hexane emissions shall be calculated monthly and recorded as the emissions for each venting event, as well as the sum of each consecutive 12-month period.”

- Add a permit condition under Notifications: “The permittee shall notify the local Board of Health or equivalent entity and the local fire department at least 24 hours prior to each planned or maintenance venting event”.

Response

The requested changes are addressed as follows:

- *Condition 7.b – The draft permit has been changed to reflect the proposal with slightly different wording: “If a leak is found that will emit less natural gas than a facility shutdown, repair may be delayed until the next facility shutdown unless the emissions from the total delayed repairs would exceed the emissions of the required shutdown.”*
- *Condition 16 – This comment does not provide any information not previously considered. The application quantified the VOC content as well as HAP content of the ACP’s natural gas. The comment does not dispute these values or otherwise indicate why they should not be accepted. DEQ performed air quality analyses to demonstrate the impact of the facility on air quality and that impact is less than the applicable standards designed to protect human health and the environment. On-going testing is not necessary nor informative. DEQ has the general authority to require testing as necessary without the requested change to the permit. .*
- *Condition 51 – BCS must maintain records for individual venting events, as well as sum all venting events to determine total emissions. In this context, the term ‘any’ is clearer and more expansive than ‘each.’*
- *Condition 51 – The condition as drafted requires calculations of hexane on both an event and annual basis. No change has been made in response to this comment.*
- *Condition 51 – Reporting of information is addressed in the following comment and response.*

Comment

Specific comments on the draft permit follow:

1. Pigging Events:
 - a. Only the use of pigging to remove liquids from the gas line was identified as the purpose of pigging in the introduction to the draft permit. Isn’t there also a requirement for the pipeline operator to use pigs to check for corrosion in the pipeline as well? How often will the pipeline be checked for corrosion? Will these pigging events be in addition to the pigging for the removal of liquids?
 - b. In the June 29, Dominion responses to questions question 10 the applicant states “When pigging operations are conducted, the procedure to inspect the line typically involves four (4) pigging devices and is conducted over a four days [sic] period”, however in the last ¶ of section 2.2.4 of the air dispersion modeling report it states “As a planned event, the pigging operations will only be conducted during daylight hours”. Which is correct the modeling or the application?
3. Ammonia:
 - a. Has the applicant performed a hazard assessment and offsite consequences analysis required under the RMP program?
 - b. Has there been coordination with the local emergency response agencies and are the local emergency response agencies equipped and trained to respond to an ammonia spill?
 - c. Has ACP mitigated the risk of an accidental release of ammonia due to reasonably foreseeable events such as forest fire or vehicle accident?
 - d. I understand that ACP does not plan on having any operators on site. Is that correct? If so who would be the first responder to a spill of the ammonia system and how long would it take for a Company representative to be on site? If the site is not manned 24-7 then the local fire department would most likely be the first responders. Has the applicant provided necessary training and access keys to be able to shut off the ammonia injection system if necessary in an emergency?
6. There are a number of Federal requirements that Virginia has not accepted delegation for including:
 - a. Synthetic minor emission limiting controls for CO, NOx, PM and VOC,

- b. NSPS OOOOa covering fugitive emissions from natural gas operations, and
- c. NSPS JJJJ and MACT ZZZZ covering spark ignition engines.

Questions:

- a. Has the applicant contacted EPA Region 3 with regards to this site?
 - b. Has DEQ coordinated the permit review with EPA Region 3?
7. Best Available Control Technology Review:
- a. It is our understanding that the facility will not be manned. How will they conduct periodic LDAR inspections if the facility is not manned?
 - b. My understanding is that the raw natural gas in the pipeline does not include an odorant. If there is no odorant then audio, visual and olfactory (AVO) inspections will not be very effective. Will the natural gas going through the pipeline include the odorant? If not then imaging technology should be required to detect for leaks.
 - c. In the discussion of Natural Gas Venting under BACT the draft permit states “ACP proposed a vent gas reduction system”. What does this involve? How much will this system reduce the natural gas emissions during maintenance activities vs venting or venting with a flare?
8. Federally enforceable permit conditions: The permit lists a number of parameters that the facility needs to keep records for:
- a. Since these parameters all deal with the operation of the emission controls and a failure of the controls could trigger a violation of the synthetic minor condition, are these conditions federally enforceable?
 - b. Will the stack testing results be available to the public after the report is submitted to DEQ?
9. Leak Detection:
- a. This is mentioned in the discussion of the BACT analysis but it bears repeating. Our understanding is that the odorant is added to the gas downstream of the compressor station so AVO inspections are not very effective. So there needs to be daily LDAR surveys.
 - b. There also should to be hourly testing during all pigging events if the natural gas does not contain the odorant.

Response

Pigging Events: The permit limits BCS to 15 venting events from pig launching/receiving in any 12-month period. This is for any reason, such as liquid removal or pipe integrity testing. The pigging events may take a number of hours or days but the venting of gas due to pigging may only occur between the hours of 9AM and 3PM as required in Condition 6.a. This condition applies to all venting events except for a venting event due to turbine startup/shutdown.

RMP (Risk Management Plan): The RMP requirements are triggered when a source holds a minimum amount of certain substances. As noted in the May 25, 2018 application, BCS will use ammonia less than 20% and will not be subject to the RMP requirements.

Non-Delegated Requirements: For non-delegated federal requirements in Parts 60 and 63 that apply to this facility, ACP must submit the required notifications to EPA, which begin with construction of the respective unit. EPA received notification of the public comment period and hearing for this draft permit. The limits contained in the permit are federally-enforceable unless otherwise noted in the permit.

Report Availability: Public records, including stack tests, are available from DEQ pursuant to the provisions of the Freedom of Information Act or FOIA

BACT for Venting/Leaks: A commenter requested information about the VGRS, including a comparison of the reductions achieved. This information was contained in ACP’s BACT analysis. A description of how the system worked was contained in Appendix H of the May 25, 2018 submittal. The operational choices by

sources such as number of personnel on-site do not excuse compliance with permit requirements. The draft permit requires daily AVO and quarterly LDAR surveys. These are completed by personnel and cannot be remotely completed. DEQ has reviewed other permits and requirements for natural gas compressor stations and has not found requirements for daily LDAR surveys. In fact, DEQ's review indicated sources have only been required to do quarterly LDAR surveys to the extent any conditions are require. The addition of odorant is not under DEQ's authority. While odor may not be as detectable, the audio and visual portions are still effective. The need for hourly testing during pigging events is not clear. Pigging events vent natural gas during the pig insertion/removal. Emissions during pigging events are expected, quantified, and limited in the draft permit. Daily AVO and quarterly LDAR surveys are BACT and appear to represent the most stringent requirements for natural gas compressor stations.

Comment

Dominion commented that the particulate matter species PM is the filterable fraction only and requested a filterable identifier be added to each permit limit regulating PM.

Response

There are three species of particulates that are regulated in the draft permit, PM, PM10, and PM2.5. PM10 and PM2.5 are criteria pollutants with promulgated NAAQS. These pollutants include both the filterable and the condensable fraction. However, PM is regulated via Part 60 with Method 5 being the test method to demonstrate compliance. Method 5 only includes the filterable fraction; therefore, PM limits only include the filterable fraction of particulate and the 'filterable' identifier is not necessary. No change is being made in response to this comment.

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE
This permit includes designated equipment subject to
New Source Performance Standards (NSPS).

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Atlantic Coast Pipeline, LLC
707 E. Main Street
Richmond, VA 23219
Registration No.: 21599

is authorized to construct and operate

a natural gas compressor station

located at

5297 S James River Hwy
Wingina, VA 24599

in accordance with the Conditions of this permit.

Approved on DRAFT, 2018.

James E. Kyle, P.E.
Air Permit Manager

Permit consists of 21 pages.
Permit Conditions 1 to 51

INTRODUCTION

This permit approval is based on the permit application dated May 25, 2018, including supplemental information dated June 29, 2018, July 3, 2018, July 10, 2018, and July 13, 2018. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action. In addition, this facility may be subject to additional applicable requirements not listed in this permit.

Words or terms used in this permit shall have meanings as provided in 9VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

Equipment List – Equipment at this facility consists of:

Equipment to be Constructed:

Ref. No.	Equipment Description	Rated Capacity	Delegated Federal Requirements
CT-01	Solar Mars Compressor turbine Model 100-16000 S	15,900 hp*	40 CFR 60, Subpart KKKK
CT-02	Solar Taurus Compressor turbine Model 70-10802 S	11,107 hp*	40 CFR 60, Subpart KKKK
CT-03	Solar Titan Compressor turbine Model 130-20502 S	20,500 hp*	40 CFR 60, Subpart KKKK
CT-04	Solar Centaur Compressor turbine Model 50-6200 LS	6,276 hp*	40 CFR 60, Subpart KKKK
EG-01	Caterpillar Emergency Engine G3516C	2,175 bhp	
FUG-01	Fugitive natural gas leaks from fugitive emission components	N/A	
VENT-01	Natural gas venting from the facility including compressor turbine start-up and shutdowns, emergency shutdown (ESD) testing, pig launching and receiving events	N/A	

*Based on ISO conditions and fuel lower heating value (LHV)

Specifications included in the above tables are for informational purposes only and do not form enforceable terms or conditions of the permit.

PROCESS REQUIREMENTS

1. **Emission Controls** – Nitrogen oxides (NO_x) emissions from the compressor turbines (CT-01 – CT-04) shall be controlled by dry low NO_x (SoLoNO_x) combustion control technology and selective catalytic reduction (SCR). The SoLoNO_x technology shall be in operation at all times the respective compressor turbine is operating except during start-up and shutdown. When a compressor turbine's inlet air temperature is less than 0°F, the SoLoNO_x technology must be operated to maximum extent possible, following the manufacturer's written protocol or best engineering practices for minimizing emissions. Each compressor turbine shall be equipped with Cold Weather Control Logic to minimize emissions when inlet air temperature is less than 0°F and shall be in operation when the respective compressor turbine is operating. Each SCR shall be in operation at all times the respective compressor turbine is operating, except during start-up and shutdown where operation shall be as described in Condition 4.e .
(9VAC 5-80-1180 and 9VAC 5-50-260)
2. **Emission Controls** – Carbon Monoxide (CO) and Volatile Organic Compound (VOC) emissions from the compressor turbines (CT-01 – CT-04) shall be controlled by an oxidation catalyst system. Each oxidation catalyst system shall be provided with adequate access for inspection and shall be in operation at all times the respective compressor turbine is operating, except during each unit start-up. An oxidation catalyst system shall be considered in operation when the catalyst bed inlet gas temperature is above 490°F.
(9VAC 5-80-1180 and 9VAC 5-50-260)
3. **Emission Controls** – Particulate emissions (PM, PM₁₀, PM_{2.5}) from the compressor turbines (CT-01 – CT-04) shall be controlled by inlet air filtering. Each filter shall be provided with adequate access for inspection and shall be in operation at all times the respective compressor turbine is operating.
(9VAC 5-80-1180 and 9VAC 5-50-260)
4. **Emission Controls** – The permittee shall operate and maintain each compressor turbine, all air pollution control equipment, and all monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times, including during start-up, shutdown, and malfunction.
 - a. For the purpose of this permit, start-up is defined as the period beginning with the first fuel fed to the compressor turbine and ending when the compressor turbine reaches 50% load.
 - b. For the purpose of this permit, shutdown is defined as the period beginning when the compressor turbine drops below 50% load for the purpose of ceasing operation and ends when fuel feeding stops.
 - c. For the purpose of this permit, an oxidation catalyst system shall be considered in operation when the catalyst bed inlet gas temperature is above 490°F.
 - d. The oxidation catalyst system shall be in operation during the shutdown of the respective compressor turbine.

- e. During start-up and shutdown, the compressor turbine SCR system (including ammonia injection) and oxidation catalyst system shall be operated in a manner to minimize emissions following the manufacturer's written protocol or best engineering practices for minimizing emissions. Written documentation shall be maintained explaining the sufficiency of the practices. If such practices are used in lieu of the manufacturer's protocol, the documentation shall justify why the practices are at least equivalent to manufacturer's protocols with respect to minimizing emissions.
- f. Annual time in start-up of each compressor turbine shall not exceed 16.7 hours per year. Annual hours of start-up shall be calculated as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- g. Annual time in shutdown of each compressor turbine shall not exceed 16.7 hours per year. Annual hours of shutdown shall be calculated as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- h. Each compressor turbine shall operate in "~~minimum pilot mode~~ SoLoNOx mode" at all times except for start-up, shutdown, and when a compressor turbine's inlet air temperature is less than 0°F. Operation not in "~~minimum pilot mode~~ SoLoNOx mode" shall not exceed an annual total of 38.4 hours per compressor turbine, calculated as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

(9VAC 5-80-1180 and 9VAC 5-50-260)

- 5. **Emission Controls** – Emissions from the emergency engine (EG-01) shall be controlled by proper engine operation in accordance with the manufacturer's written instructions, or procedures developed by the permittee that are approved by the manufacturer, over the entire life of the engine. In addition, the permittee may only change those settings that are approved by the manufacturer in a manner consistent with good air pollution control practices for minimizing emissions.
(9VAC 5-80-1180 and 9VAC 5-50-260)
- 6. **Emission Controls** – The permittee shall implement the following work practices to reduce emissions from venting of natural gas from the facility.
 - a. Except to achieve the start-up or shutdown of a compressor turbine, the permittee shall not purposefully vent gases from piping at the facility except between the hours of 9:00 AM and 3:00 PM.
 - b. Emissions from each emergency shutdown (ESD) test shall be controlled by installation of a block valve directly following each ESD blowdown valve. The block valve shall be closed

prior to initiating any ESD test and shall be opened only after the ESD blowdown valve has closed.

- c. Pig launching and recovery events shall be limited to fifteen events per 12-month period, each. Emissions from these events shall be limited to the gas contained in the pig launching or recovery chambers. The permittee shall have available written operating procedures to minimize emissions from pig launching and recovery. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- d. Except as provided in Condition 6.g, the permittee shall control emissions from the shutdown of each compressor turbine by maintaining pressurized hold for the compressor turbine. Pressurized hold shall be achieved by maintaining sufficient differential pressure between the seal gas and compressor turbine case such that the dry seal maintains integrity for the entire duration of the shutdown. Sufficient differential pressure shall be determined for each compressor turbine during the tests required in Condition 34.
- e. The permittee shall install a vent gas reduction system (VGRS) to ensure the sufficient differential pressure required in Condition 6.d is maintained. The VGRS shall be provided with adequate access for inspection and shall be in operation as necessary to ensure sufficient differential pressure between the seal gas and compressor turbine case such that the dry seal is maintained for the respective compressor turbine in compliance with Condition 6.g.
- f. The permittee shall continuously monitor and record the seal gas pressure and compressor turbine case pressure for each compressor turbine.
- g. For each compressor turbine, the permittee shall vent gas from no more than ten start-ups and ten shutdowns per year, calculated monthly as the sum of each consecutive 12-month period. A compressor turbine may not vent gas unless the compressor turbine case pressure is less than or equal to 44.7 psia. The permittee shall ensure isolation valves are closed and record the compressor turbine case pressure at the beginning of each compressor turbine shutdown venting event. The permittee shall minimize the amount of time for each compressor turbine start-up purge.

(9VAC 5-80-1180 and 9VAC 5-50-260)

- 7. **Emission Controls** – The permittee shall implement the following work practices to reduce emissions from leaks of natural gas from the facility.
 - a. The permittee shall develop, maintain, and implement a fugitive emission component monitoring and repair plan. In developing this plan, the definition of “fugitive emissions component” shall be the same as contained in 40 CFR 60.5430a. This plan shall consist of a daily auditory/visual/olfactory (AVO) inspection program for all fugitive emissions components. The plan shall also consist of a quarterly leak detection survey. A leaking fugitive emissions component for the purpose of the quarterly survey shall be an instrument reading of 500 ppm or more using Method 21 or an optical gas imaging camera. The instrument utilized must be maintained, calibrated, and operated in accordance with Method 21

and the manufacturer's specifications. The initial survey shall be conducted no later than 60 days after the facility start-up with subsequent surveys conducted no less frequently than every calendar quarter. Consecutive surveys shall be no less than 60 days apart.

- b. The first attempt to repair any fugitive emissions component found to be leaking during an AVO inspection or a quarterly survey shall be made as soon as practicable but no later than 5 days after discovery. The leaking fugitive emissions component shall be repaired within 15 days of discovery. The permittee shall maintain a list of difficult to repair fugitive emissions components, which when leaking, the repair requires facility shutdown or cannot otherwise be completed within 15 days of discovery; documentation justifying the inclusion of a fugitive emissions component on the list shall be included. If a leak is found that will emit more natural gas than the required shutdown, the shutdown shall occur and the leak be repaired. If a leak is found that will emit less natural gas than a facility shutdown, repair may be delayed until the next facility shutdown unless the emissions from the total delayed repairs would exceed the emissions of the required shutdown. Records of the daily AVO inspection results, repair attempts, and the list of long-term leaking fugitive emissions components and reason for each delay shall be maintained on site.
- c. The monitoring plan shall be submitted to the Piedmont Regional Office for review no later than 60 days prior to start-up of the facility.
- d. The fugitive emissions components on the VGRS shall be part of the daily AVO and quarterly leak detection survey.

(9VAC 5-80-1180 and 9VAC 5-50-260)

- 8. **Monitoring Devices** – Each compressor turbine (CT-01 – CT-04) shall be equipped with devices to continuously measure and record compressor turbine inlet air temperature, compressor turbine load, and pilot operating mode. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures that shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the compressor turbine is operating.

(9VAC 50-80-1180 and 9VAC 5-50-20 C)

- 9. **Monitoring Devices** – Each SCR system shall be equipped with devices to continuously measure and record ammonia injection rate, catalyst bed differential pressure, and catalyst bed inlet gas temperature. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures that shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the SCR system is operating.

(9VAC 50-80-1180 and 9VAC 5-50-20 C)

- 10. **Monitoring Devices** – Each compressor turbine shall be equipped with devices to continuously measure and record the seal gas pressure and the compressor turbine case pressure. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures that shall include, as a minimum, the manufacturer's written requirements or

recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation at all times.
(9VAC 50-80-1180 and 9VAC 5-50-20 C)

11. **Monitoring Devices** – Each oxidation catalyst system shall be equipped with a device to continuously measure and record the gas temperature at the catalyst bed inlet and the catalyst bed differential pressure. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures that shall include, at a minimum, the manufacturer’s written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the oxidation catalyst system is operating.
(9VAC 5-80-1180 and 9VAC 5-50-20 C)
12. **Monitoring Device** – The emergency engine (EG-01) shall be equipped with a non-resettable hour meter to continuously measure hours of operation. The monitoring device shall be installed, maintained, calibrated, and operated in accordance with approved procedures, which shall include, as a minimum, the manufacturer’s written requirements or recommendations. The monitoring device shall be provided with adequate access for inspection and shall be in operation when the emergency engine is operating.
(9VAC 5-80-1180 and 9VAC 5-50-20 C)
13. **Monitoring Plan** – The permittee shall develop and operate in accordance with an approved monitoring plan for the monitoring devices identified in Conditions 8, 9, and 11. The plan shall include ranges for each parameter. The range values shall be established during the initial performance tests required in Condition 29 and revalidated during the subsequent performance tests required in Condition 31. Ranges shall be 3-hour rolling averages. The monitoring plan shall be submitted to the Piedmont Regional Office with the test results as required in Condition 29.
(9VAC 5-80-1180 and 9VAC 5-50-20 C)

OPERATING LIMITATIONS

14. **Fuel** – The approved fuel for the four compressor turbines (CT-01, CT-02, CT-03, and CT-04) and emergency engine (EG-01) is pipeline natural gas. A change in the fuel shall be considered a change in the method of operation of the four compressor turbines (CT-01, CT-02, CT-03, and CT-04) and emergency engine (EG-01) and may require a new or amended permit.
(9VAC 5-80-1180)
15. **Fuel** – The pipeline natural gas shall not exceed a sulfur content of 1.1 grains of sulfur per 100 standard cubic feet at any time.
(9VAC 5-80-1180)
16. **Fuel Monitoring** – The permittee shall use the fuel quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the fuel, specifying that the maximum total sulfur content for the natural gas being fired at the natural gas compressor station facility is 1.1 grains of sulfur or less per 100 standard cubic feet. In the alternative, the permittee may perform annual fuel analysis of on-site natural gas. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to

testing. One copy of the test results shall be submitted to the Piedmont Regional Office no later than 60 days after test completion and shall conform to the test report format enclosed with this permit. (9VAC 5-80-1180 and 9VAC 5-50-410)

17. **Operating Hours** – The emergency engine (EG-01) shall be operated for the purposes of maintenance, testing, and emergencies (as defined in 9VAC5-80-1110C) only. The emergency engine (EG-01) shall not operate more than 500 hours per year, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months. (9VAC 5-80-1180 and 9VAC 5-50-260)
18. **Requirements by Reference** – Except where this permit is more restrictive than the applicable requirement, the compressor turbines (CT-01 through CT-04) as described in the Introduction shall be operated in compliance with the requirements of 40 CFR 60, Subpart KKKK. (9VAC 5-80-1180, 9VAC 5-50-400 and 9VAC 5-50-410)

EMISSION LIMITS

19. **Emission Limits** – Emissions from the operation of the emergency engine (EG-01) shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	2.0 g/hp-hr	0.60 tons/yr
Carbon Monoxide	4.0 g/hp-hr	2.40 tons/yr
Volatile Organic Compounds	1.0 g/hp-hr	0.60 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 5, 17, 30, and 32 . (9VAC 5-80-1180 and 9VAC 5-50-260)

20. **Emission Limits** – Emissions from the operation of the Mars compressor turbine (CT-01) shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	3.75 ppm _{vd} @15% O ₂ *	9.09 lb/hr**	8.62 tons/yr
Carbon Monoxide	2.00 ppm _{vd} @15% O ₂ *	2.53 lb/hr**	5.39 tons/yr
Volatile Organic Compounds	1.25 ppm _{vd} @15% O ₂ *	0.46 lb/hr**	1.31 tons/yr
PM		0.83 lb/hr**	3.59 tons/yr
PM10		2.86 lb/hr**	12.45 tons/yr

PM2.5	2.86 lb/hr**	12.45 tons/yr
Sulfur Dioxide	0.49 lb/hr**	2.12 tons/yr

* Limit does not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. Limits are a 3-hour average.

** Limit does not apply during periods of start-up and shutdown. Limits are a 3-hour average.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 1, 2, 4, 13, 29, and 31.
 (9VAC 5-80-1180 and 9VAC 5-50-260)

21. **Emission Limits** – Emissions from the operation of the Taurus compressor turbine (CT-02) shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	3.75 ppm ppmv@15% O ₂ *	6.01 lb/hr**	5.73 tons/yr
Carbon Monoxide	2.00 ppm ppmv@15% O ₂ *	1.67 lb/hr**	6.47tons/yr
Volatile Organic Compounds	1.25 ppm ppmv@15% O ₂ *	0.30 lb/hr**	1.75 tons/yr
PM		0.56 lb/hr**	2.37 tons/yr
PM10		1.92 lb/hr**	8.22 tons/yr
PM2.5		1.92 lb/hr**	8.22 tons/yr
Sulfur Dioxide		0.33 lb/hr**	1.40 tons/yr

* Limit does not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. Limits are a 3-hour average.

** Limit does not apply during periods of start-up and shutdown. Limits are a 3-hour average.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 1, 2, 4, 13, 29, and 31.
 (9VAC 5-80-1180 and 9VAC 5-50-260)

22. **Emission Limits** – Emissions from the operation of the Titan compressor turbine (CT-03) shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	3.75 ppm ppmv@15% O ₂ *	11.03 lb/hr**	10.48 tons/yr
Carbon Monoxide	2.00 ppm ppmv@15% O ₂ *	3.07 lb/hr**	6.46 tons/yr

Volatile Organic Compounds	1.25 ppm ppmv@15% O ₂ *	0.55 lb/hr**	1.77 tons/yr
PM		1.0 lb/hr**	4.35 tons/yr
PM10		3.47 lb/hr**	15.10 tons/yr
PM2.5		3.47 lb/hr**	15.10 tons/yr
Sulfur Dioxide		0.59 lb/hr**	2.57 tons/yr

* Limit does not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. Limits are a 3-hour average.

** Limit does not apply during periods of start-up and shutdown. Limits are a 3-hour average.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 1, 2, 4, 13, 29, and 31.
 (9VAC 5-80-1180 and 9VAC 5-50-260)

23. **Emission Limits** – Emissions from the operation of the Centaur compressor turbine (CT-04) shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	3.75 ppm ppmv@15% O ₂ *	3.86 lb/hr**	3.68 tons/yr
Carbon Monoxide	2.00 ppm ppmv@15% O ₂ *	1.07 lb/hr**	2.37 tons/yr
Volatile Organic Compounds	1.25 ppm ppmv@15% O ₂ *	0.20 lb/hr**	0.69 tons/yr
PM		0.35 lb/hr**	1.52 tons/yr
PM10		1.20 lb/hr**	5.28 tons/yr
PM2.5		1.20 lb/hr**	5.28 tons/yr
Sulfur Dioxide		0.21 lb/hr**	0.90 tons/yr

* Limit does not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. Limits are a 3-hour average.

** Limit does not apply during periods of start-up and shutdown. Limits are a 3-hour average.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 1, 2, 4, 13, 29, and 31.
 (9VAC 5-80-1180 and 9VAC 5-50-260)

24. **Emission Limits** – Volatile organic compounds emissions shall not exceed the limits specified below:

Fugitive Emissions Components	0.91 tons/yr
Pig Receiving	0.32 tons/yr
Pig Launching	0.31 tons/yr
Combined Compressor Turbine Venting (Start-up and Shutdown)	0.26 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 6, 7, and 35.
(9VAC 5-80-1180)

25. **Visible Emission Limit** – Visible emissions from the each compressor turbine (CT-01 – CT-04) shall not exceed 5% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A).
(9VAC 5-80-1180 and 9VAC 5-50-260)
26. **Visible Emission Limit** – Visible emissions from the emergency engine (EG-01) shall not exceed 5% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A).
(9VAC 5-80-1180 and 9VAC 5-50-260)
27. **Visible Emission Limit** – Visible emission observations from compressor turbines (CT-01, CT-02, CT-03, and CT-04) shall be conducted at least once a week. If visible emissions are observed, the permittee shall take timely corrective action such that the equipment resumes operation with no visible emissions or perform a visible emission evaluation (VEE) in accordance with 40 CFR 60, Appendix A, Method 9 to assure visible emissions from the emission unit is less than five (5) percent opacity. A record of the date, time, observer, cause and corrective measures taken shall be made. If no visible emissions were observed, a record of the date, time and observer shall be made. These records shall be maintained on site by the permittee for the most recent 5-year period.
(9VAC 5-80-1180)

TESTING

28. **Emissions Testing** – The facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports, safe sampling platforms, and access shall be provided when requested.
(9VAC 5-50-30 F and 9VAC 5-80-1180)
29. **Stack Test** – Initial performance tests shall be conducted for NO_x, CO, VOC, PM₁₀, and PM_{2.5} from each compressor turbine (CT-01 – CT-04) to determine compliance with the emission limits contained in Conditions 20, 21, 22, and 23. The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be

operated but in no event later than 180 days after start-up of the permitted facility. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30, and the test methods and procedures contained in each applicable section or subpart listed in 40CFR Part 51 Appendix M or 9 VAC 5-50-410. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility and shall conform to the test report format enclosed with this permit. (9 VAC 5-50-30 and 9 VAC 5-80-1200)

30. **Stack Test** – Initial performance tests shall be conducted for NO_x, CO, and VOC from the emergency engine (EG-01) to determine compliance with the emission limits contained in Condition 19. The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30, and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility and shall conform to the test report format enclosed with this permit. (9 VAC 5-50-30 and 9 VAC 5-80-1200)
31. **Stack Test** – The permittee shall repeat the performance tests contained in Condition 29 every two years. Subsequent tests shall be performed no later than 26 months after the previous test. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office no later than 60 days after test completion and shall conform to the test report format enclosed with this permit. (9 VAC 5-50-30 and 9 VAC 5-80-1200)
32. **Stack Test** – The permittee shall repeat the performance tests contained in Condition 30 every 8,760 hours of operation or 36 months, whichever is earlier. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office no later than 60 days after test completion and shall conform to the test report format enclosed with this permit. (9 VAC 5-50-30 and 9 VAC 5-80-1200)
33. **Visible Emissions Evaluation** – Concurrently with the initial performance tests in Conditions 29 and 30 and subsequent performance tests in Conditions 31 and 32, Visible Emission Evaluations (VEE) in accordance with 40 CFR Part 60, Appendix A, Method 9, shall also be conducted by the permittee. Each test shall consist of 30 sets of 24 consecutive observations (at 15 second intervals) to yield a six minute average. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. The initial test shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Should conditions prevent concurrent opacity observations,

the Piedmont Regional Office shall be notified in writing, within seven days, and visible emissions testing shall be rescheduled within 30 days. Rescheduled testing shall be conducted under the same conditions (as possible) as the initial performance tests. One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-80-1200)

34. **VGRS Evaluation** - The permittee shall ensure proper operation and maintenance of the pressurized hold required in Condition 6.d by performing an evaluation for each compressor turbine by quantitative analysis of leaks during a pressurized hold using Method 21 or an optical gas imaging camera. The seal gas pressure and the compressor turbine case pressure shall be monitored during this evaluation to ensure continued proper operation of the VGRS and shall form acceptable ranges for on-going operation. The initial evaluation shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Subsequent annual evaluations shall be performed, reported, and demonstrate compliance thereafter at a period not to exceed 13 months from the preceding evaluation. The test report shall conform to the test report format enclosed with this permit and shall include the established pressure ranges.
(9 VAC 5-50-30 and 9 VAC 5-80-1200)

RECORDS AND REPORTING

35. **On Site Records** – The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Piedmont Regional Office. These records shall include, but are not limited to:
- a. Monthly and annual consumption of natural gas for each unit at the facility. Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
 - b. Operation and control device monitoring records as required in Conditions 6, 7, 8, 9, 10, 11, 12, and 16.
 - c. Records for each event when a compressor turbine does not operate in “~~minimum pilot mode~~ **SoLoNOx mode**” shall include event duration, event reason, and annual hours. Annual hours shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
 - d. Documentation from Solar for all parameters and their ranges that are relevant to the SoLoNOx mode determination

- ~~d.e.~~ Records of fuel quality characteristics to demonstrate compliance with Condition 16.
- ~~e.f.~~ Monthly emissions calculations for NOx, CO, VOC, PM10, and PM2.5 from each unit at the facility using calculation methods approved by the Piedmont Regional Office to demonstrate compliance with the annual emission limitations in Conditions 19, 20, 21, 22, 23, and 24.
- ~~f.g.~~ Scheduled and unscheduled maintenance and operator training.
- ~~g.h.~~ Records of actual piping pressure prior to venting gas from that section of piping, the clock time for the opening and closing of any vent valve, the amount of gas vented during the event, and any mitigation measures used. These records include the ESD testing, venting of natural gas due to pigging events, compressor turbine start-up purge, and compressor turbine shutdown venting.
- ~~h.i.~~ Records of the time, date, and duration of each compressor turbine start-up and shutdown event.
- ~~i.j.~~ Records of the operating time and reason for each operation of the emergency engine (EG-01)
- ~~j.k.~~ Results of all stack test data, VGRS evaluations, and visible emissions evaluations.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9VAC 5-80-1180 and 9VAC 5-50-50)

36. **Reporting** - The permittee shall submit a certification of compliance with all terms and conditions of this permit, including emission limitation standards or work practices, as well as any other applicable requirement to DEQ no later than March 1 and September 1 of each calendar year. This report must be signed by a responsible official, consistent with 9VAC5-20-220. The time periods to be addressed are January 1 to June 30 and July 1 to December 31. Each report shall include the following information:

- a. Exceedances of emissions limitations or operational restrictions;
- b. Excursions from control device operating parameter requirements, as documented by continuous emission monitoring; and
- c. Failure to meet monitoring, recordkeeping, or reporting requirements contained in this permit.

If there were no deviations from permit conditions during the time period, the permittee shall include a statement in the report that "no deviations from permit requirements occurred during this semi-annual reporting period." These reports shall be maintained and shall be current for the most recent five years.

(9VAC 5-80-1180 and 9VAC 5-50-50)

NOTIFICATIONS

37. **Initial Notifications** – The permittee shall furnish written notification to the Piedmont Regional Office of:
- a. The actual date on which construction of the natural gas compressor station commenced within 30 days after such date.
 - b. The anticipated start-up date of the natural gas compressor station postmarked not more than 60 days nor less than 30 days prior to such date.
 - c. The actual start-up date of the natural gas compressor station within 15 days after such date.
 - d. The anticipated date of performance tests postmarked at least 30 days prior to such date.
 - e. Copies of the written notification referenced in items 37.a through 37.d above are to be sent to:

Associate Director
Office of Air Enforcement and Compliance Assistance (3AP20)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

(9VAC 5-50-50 and 9VAC 5-80-1180)

GENERAL CONDITIONS

38. **Permit Invalidity** – This permit to construct the new stationary source shall become invalid, unless an extension is granted by the DEQ, if:
- a. A program of continuous construction is not commenced within 18 months from {the date of this permit.
 - b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of the phased construction of a new stationary source or project.

(9VAC 5-80-1210)

39. **Permit Suspension/Revocation** – This permit may be suspended or revoked if the permittee:
- a. Knowingly makes material misstatements in the permit application or any amendments to it;
 - b. Fails to comply with the conditions of this permit;
 - c. Fails to comply with any emission standards applicable to a permitted emissions unit;

- d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emissions limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9VAC 5-80-1210 G)

40. **Right of Entry** – The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9VAC 5-170-130 and 9VAC 5-80-1180)

41. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.

- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.
(9VAC 5-50-20 E and 9VAC 5-80-1180 D)

42. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown, or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9VAC 5-80-1180 D)
43. **Notification for Facility or Control Equipment Malfunction** – The permittee shall furnish notification to the Piedmont Regional Office of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour. Such notification shall be made no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within 14 days of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the Piedmont Regional Office.
(9VAC 5-20-180 C and 9VAC 5-80-1180)
44. **Violation of Ambient Air Quality Standard** – The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
(9VAC 5-20-180 I and 9VAC 5-80-1180)
45. **Change of Ownership** – In the case of a transfer of ownership of the stationary source, the new owner shall abide by any current minor NSR permit issued to the previous owner. The new owner shall notify the Piedmont Regional Office of the change of ownership within 30 days of the transfer.
(9VAC 5-80-1240)
46. **Permit Copy** – The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9VAC 5-80-1180)

STATE-ONLY ENFORCEABLE (SOE) REQUIREMENTS

The following terms and conditions are included in this permit to implement the requirements of 9VAC 5-40-130 et seq., 9VAC 5-50-130 et seq., 9VAC 5-60-200 et seq. and/or 9VAC 5-60-300 et seq. and are enforceable only by the Virginia Air Pollution Control Board. Neither their inclusion in this permit nor any resulting public comment period make these terms federally enforceable.

47. **(SOE) Emission Limits** – Formaldehyde (CAS# 50-00-0) emissions from the facility shall not exceed the limits specified below:

CT-01	2.56 lb/hr	0.19 lb/hr*	1.04 tons/yr
CT-02	4.70 lb/hr	0.13 lb/hr*	0.85 tons/yr
CT-03	3.09 lb/hr	0.23 lb/hr*	1.26 tons/yr
CT-04	1.17 lb/hr	0.08 lb/hr*	0.45 tons/yr
EG-01	2.50 lb/hr		0.63 tons/yr
Total Facility	14.02 lb/hr		4.25 tons/yr

* Limit does not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F

Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 2, 4, 5, ~~7~~-17, 49, 50, and 51. (9VAC 5-60-320, 9VAC 5-80-1180, and 9VAC 5-80-1120F)

48. **(SOE) Emission Limits** – Hexane (CAS# 110-54-3) emissions from venting events at the facility shall not exceed the limits specified below:

CT-01	0.87 lb/hr
CT-02	0.37 lb/hr
CT-03	0.97 lb/hr
CT-04	0.19 lb/hr
Pig Receiving	2.62 lb/event
Pig Launching	2.51 lb/event

Compliance with these limits may be determined as stated in Conditions 6, 7, and 51. (9VAC 5-60-320, 9VAC 5-80-1180, and 9VAC 5-80-1120F)

49. **Stack Test** – Concurrently with the performance tests in Condition 29 and 31, initial performance tests shall be conducted for formaldehyde from each compressor turbine (CT-01 – CT-04) to determine compliance with the emission limits contained in Conditions 47. The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum

production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-60-30, and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-60-100. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility and shall conform to the test report format enclosed with this permit.

(9VAC 5-60-30, 9VAC 5-80-1180, and 9VAC 5-80-1120F)

50. **Stack Test** – Concurrently with the performance tests in Conditions 30 and 32, initial performance tests shall be conducted for formaldehyde from the emergency engine (EG-01) to determine compliance with the emission limit contained in Condition 47. The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-60-30, and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-60-100. The details of the tests are to be arranged with the Piedmont Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Piedmont Regional Office within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility and shall conform to the test report format enclosed with this permit.

(9VAC 5-60-30, 9VAC 5-80-1180, and 9VAC 5-80-1120F)

51. **(SOE) On Site Records** – The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Piedmont Regional Office. These records shall include, but are not limited to the hourly, monthly, and annual emissions (in pounds and tons) of formaldehyde and hexane. The permittee shall calculate the amount of hexane exhausted during any venting event. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. Records of performance test results shall be maintained. These records shall be available for inspection by DEQ and current for at least the most recent five years.

(9VAC 5-60-50, 9VAC 5-80-1180, and 9VAC 5-80-1120F)