TENTATIVE AGENDA
STATE AIR POLLUTION CONTROL BOARD MEETING

WEDNESDAY, JULY 7, 2021

IN PERSON ONLY - THE WESTIN RICHMOND
6631 WEST BROAD STREET RICHMOND, VA 23230

PERSONS ATTENDING THE MEETING ARE ASKED TO ABIDE BY THE CENTER FOR DISEASE CONTROL COVID-19 GUIDANCE FOR FACE MASKS
(https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html)

Any Updates To The Details/Final Arrangements
To Be Announced Through the Virginia Regulatory Town Hall

Convene – July 7, 2021 - 10:00 A.M.

Agenda Item	**Presenter**	**Tab**
Call to Order	Hoagland	
Introductions	Board Members	
Review and Approve Agenda	Board Members	
Review and Approve Minutes (April 23, 2021)	Board Members	A
Update on Agency Environmental Justice Activities	Paylor	
Introduction of Director of the Environmental Justice Office	Paylor/Hoyos	
Director/Division Director Report/Updates: (i) COVID-19 response (ii) upcoming regulatory actions (iii) pending permit applications	Paylor/Dowd	
Public Engagement Committee Report	Hoagland/Kapur	
High Priority Violations Report	Nicholas	B See PB 5
At 1:00 p.m.		
Mountain Valley Pipeline, LLC Lambert Compressor Station Registration No.: 21652 - Stationary Source Permit to Construct and Operate: Board Consideration and Public Comment per Board Guidelines	Jenkins	
• Board Memorandum		C See page 9
• Attachment A - Draft Permit (Clean Copy) not included in mini book		D
• Attachment B - Draft Permit (Track Changes)		E See page 17
• Attachment C - Draft Permit Engineering Analysis		F See page 43
• Attachment D - Air Quality Analyses Review		G See page 81
• Attachment E - Public Participation Report including List of Commenters and Representative Samples of Public Comments		H See page 87
• Attachment F - Summary of and Response to Public Comments		I See page 99

Agenda Item	Presenter	Tab
Public Forum		
Future Meetings (confirm September 17 and December 3)	Board Members	

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 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 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) 698-4178; e-mail: cindy.berndt@deq.virginia.gov.

Additional Meeting Information:

- The Board asks that attendees refrain from disrupting the meeting or from allowing it to proceed in an orderly, efficient, and effective fashion.
- The Board asks that all attendees be respectful of all speakers.
- The Board will conduct the meeting not only to ensure the efficient and effective conduct of business, but also to ensure that there is no interference with the business of the hotel, its employees and guests.
- Use of any device that may disrupt the conduct of business is prohibited, including but not limited to: voice-amplification equipment; bullhorns; blow horns; sirens, or other noise-producing devices.
- Disruptive behavior may result in the Board's recessing the meeting or removing an attendee.

REPORT TO THE STATE AIR POLLUTION CONTROL BOARD CONCERNING HIGH PRIORITY VIOLATIONS (HPVs) FOR THE SECOND QUARTER 2021

NOVs Issued from January through March 2021

PRO	**WestRock CP LLC – West Point** West Point, Virginia Registration No. 40126	**Discovery Date:** 12/11/2020 **Alleged Violations:** Exceeded opacity limit and annual fossil fuel capacity factor on recovery furnace; failed to install and operate CEMS for measuring SO2 and NOx emissions in 2019 and 2020.	**NOV:** Issued 1/20/2021
SWRO	**Bristol Virginia Integrated Solid Waste Facility** Bristol, Virginia Registration No. 11184	**Discovery Date:** 2/1/2021 **Alleged Violations:** Failed to conduct & record monthly VEO on landfill gas utility flare when operating, failed to document startup and shutdown events associated with landfill gas utility flare & submitted of erroneous semi-annual SSM report	**NOV:** Issued 2/22/2021
TRO	**Hampton/NASA Steam Plant** Hampton, Virginia Registration No. 61019	**Discovery Date:** 2/19/2021 **Alleged Violations:** Exceeded particulate matter (PM/PM10) and Hydrogen Chloride (HCL) limits during performance test.	**NOV:** Issued 3/16/2021

Consent Orders issued from January through March 2021

None to Report.

Consent Orders in Development – Previously Reported NOVs

BRRO	**Dynax America Corp USA** Roanoke, Virginia Registration No. 21279	**Discovery Dates:** 3/31/2020 **Alleged Violations:** Exceeded limit for total annual HCL throughput and failed to report the deviation.	**NOV:** Issued 6/2/2020

BRRO	**Lhoist North America – Kimballton Plant** Ripplemead. Virginia Registration No. 20225	**Discovery Date:** 4/23/2020 **Alleged Violations:** Continuous Opacity Monitoring System not calibrated in accordance with MACT AAAAA requirements.	**NOV:** Issued 5/27/2020
BRRO	**U.S. Army – Radford Army Ammunition Plant** Radford, Virginia Registration No. 20656	**Discovery Date:** 4/30/2020 **Alleged Violations:** Failed to conduct twelve weekly Method 22 visible emissions observations and failed to report these deviations in Semi-Annual Monitoring Report.	**NOV:** Issued 5/13/2020
NRO	**Buckeye Terminals LLC – Fairfax Terminal** Fairfax, Virginia Registration No. 70220	**Discovery Date**: 9/1/2020 **Alleged Violations**: Exceeded VOCmg/liter loading loss limit during stack test; failure to complete required stack test; late submittal of stack test report and late reporting of exceedance.	**NOV**: Issued 9/22/2020
PRO	**AMPAC Fine Chemicals Virginia, LLC** Petersburg, Virginia Registration No. 50856	**Discovery Date:** 5/8/2019 **Alleged Violations:** Late submittal of Title V application, late submittal of notification of use of methelyne chloride, improper leak testing of chemical manufacturing process unit, missing or incomplete records and inspection plans.	**NOV:** Issued 8/12/2019
PRO	**INGENCO – Amelia** Jetersville, Virginia Registration No. 31047	**Discovery Date:** 5/10/2018 **Alleged Violations:** Failed to maintain records as required by permit or regulation, exceeded inlet charge air temperature.	**NOV:** Issued 8/13/2018

PRO	**INGENCO – Rockville Plant** Rockville, Virginia Registration No. 51201	**Discovery Date:** 2/12/2020 **Alleged Violations:** Failed to maintain records and failed to report deviations in Semi-Annual Monitoring Reports.	**NOV:** Issued 5/6/2020
PRO	**Richmond Energy LLC** Henrico, Virginia Registration No. 52198	**Discovery Date:** 8/12/2019 **Alleged Violation:** Exceeded maximum sulfur content in landfill gas analysis; exceeded short term VOC and SO2 emissions limits during stack test	**NOV:** Issued 10/31/2019
VRO	**Valley Proteins, Inc. - Linville** Linville, Virginia Registration No. 80144	**Discovery Date:** 5/1/2020 **Alleged Violations:** Failed stack test –exceeded the exemption emission rate for formaldehyde emissions.	**NOV:** Issued 6/15/2020

COMMONWEALTH OF VIRGINIA
STATE AIR POLLUTION CONTROL BOARD MEETING
July 16, 2021

SUBJECT: Minor New Source Review Permit for the Mountain Valley Pipeline - Lambert Compressor Station, Registration No. 21652 - Public Participation Report and Request for Board Action

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

Paul R. Jenkins
Manager, Air Permitting – Blue Ridge Regional Office
Department of Environmental Quality

INTRODUCTION

The Lambert Compressor Station (LCS) is a natural gas compressor station proposed for location in Pittsylvania County east of Chatham, Virginia. As part of the Mountain Valley Pipeline's Southgate Project, LCS will be located along the natural gas pipeline to enable the gas to continue traveling along the pipeline to potential recipients in Virginia, south of LCS and in southeastern United States, including a local distribution company in North Carolina.

On November 8, 2018, the owner, Mountain Valley Pipeline, LLC, (MVP) submitted an application to construct and operate a natural gas compressor station, with auxiliary equipment that would provide the facility with its own source of electricity. As part of the application, new sources are required to submit a Local Governing Body Certification Form to the county's zoning official for approval. LCS is exempt according to Pittsylvania County zoning ordinance PCC §35-50. The application was deemed complete on September 16, 2020.

Staff analysis has shown that LCS has met the requirements of the minor New Source Review (NSR) 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 (Attachment A), will be in compliance with all applicable ambient air quality standards.

PERMIT APPLICATION REVIEW

MVP is proposing to construct and operate the following natural gas-fired combustion turbines:

- A Solar Mars 100 combustion turbine (CT-01)
- A Solar Taurus 70 combustion turbine (CT-02)

Along with the combustion turbines, five natural gas-fired microturbines (MT-01 to MT-05) will be used for site electricity. A natural gas-fired preheater (HT-01) for heating the natural gas prior to combustion.

Two storage tanks will be used at the facility (TK-01 and TK-02) to contain fluids collected from the station's separators, filters and floor drains, prior to offsite disposal. Two, vertical pressurized tanks (M-100 and T-70), for storing aqueous ammonia used for each turbine's Selective Catalytic Reduction (SCR) control system.

The pollutants subject to Article 6 permitting from the emissions units are particulate matter having an aerodynamic diameter equal to or less than 2.5 microns (PM2.5) and formaldehyde. DEQ requested that MVP incorporate additional controls/operational practices for NOx, CO, VOC

and hexane emissions. MVP concurred resulting in the following additional controls: NOx emissions will be controlled using dry low-NOx combustion and selective catalytic reduction (SCR) technology, carbon monoxide (CO), volatile organic compounds (VOC) will be controlled by oxidation catalyst (OxCat) technology. Emissions of VOC and hexane from venting of natural gas will be controlled by capped emergency shutdown system testing, leak detection surveys, and vent gas reduction system for the shutdown and startup venting of the combustion turbines (CT-01, CT-02). The total emissions from the proposed project are shown in Table 1.

Table 1. Total emissions from proposed LCS facility:

Pollutant	**Emission Rate (ton/yr)**
PM2.5	10.4
CO	17.3
NOx	12.4
VOC	3.3
SO_2	5.4
Formaldehyde	0.822

Note: Other toxic pollutants were exempt from regulation and are 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 an uncontrolled emission rate (UER) of a pollutant over the exemption thresholds in 9VAC5-80-1105C, is subject to review for that pollutant. The pollutant exceeding the respective exemption level for the proposed LCS is PM2.5.

Toxic Pollutants

A stationary source with the potential to emit a Virginia air toxic greater than the respective toxic pollutant exemption levels in 9VAC5-60-300 is subject to review for that pollutant. The pollutant exceeding the associated exemption rates for the proposed LCS is formaldehyde. Since the controlled emissions for formaldehyde also exceed the respective toxic pollutant exemption level the source is required to conduct air quality analysis.

BACT

Pollutants subject to review from a proposed facility must undergo a BACT analysis. For the proposed LCS, the pollutants subject to BACT are PM2.5 and formaldehyde. A summary of the BACT analysis is presented in Table 2.

Table 2 – BACT for normal operation

Pollutant	**BACT**	**Control**	**Compliance**
Turbine (CT-01) - PM2.5	1.36 lb/hr (3-hr average)	Inlet air filters	Stack test, visible emission limit
Turbine (CT-02) - PM2.5	0.93 lb/hr (3-hr average)	Inlet air filters	Stack test, visible emission limit

Pollutant	BACT	Control	Compliance
Microturbine - PM2.5	0.02 lb/hr (ea.)	Good combustion practices	Stack test, visible emission limit
Turbine (CT-01) - Formaldehyde	0.40 lb/hr	Oxidation catalyst	Stack test, operational monitoring (e.g., catalyst temperature)
Turbine (CT-02) - Formaldehyde	0.27 lb/hr	Oxidation catalyst	Stack test, operational monitoring (e.g., catalyst temperature)
Microturbines - Formaldehyde	0.04 lb/hr	Good combustion practices	Stack test, visible emission limit

State Toxic Pollutants/Hazardous Air Pollutants (HAPs)
None of the affected emissions units at the proposed LCS are in a source category subject to a standard promulgated pursuant to 40 CFR 63 since the proposed facility is not a major source for hazardous air pollutants.

The proposed LCS will emit a toxic air pollutant, formaldehyde, at levels which exceed the respective exemption thresholds (hourly and annual) in 9VAC5-60-300. Other air toxics or hazardous air pollutants are emitted from the proposed LCS, but the potential to emit of each of these pollutants does not exceed the individual hourly and annual toxic pollutant exemption levels. Therefore, per 9VAC5-60-300, the emissions are not subject to permitting requirements.

Formaldehyde emission limitations and associated requirements are included in the draft permit as state only enforceable (SOE) in order to implement the requirements of 9VAC5-60-300 et. seq.

Testing
The permit requires initial stack testing for NOx, CO, PM10, PM2.5, VOC, opacity, and formaldehyde for each turbine. Periodic stack testing shall be performed no later than 26 months after the previous test. 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 LCS 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. LCS must develop a monitoring plan for the turbine and microturbine monitoring parameters. For

the vent gas reduction system, LCS 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 LCS 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. LCS is further required by the permit to keep records of all testing results.

Reporting

LCS must provide semi-annual reports to DEQ of their compliance status, including whether or not excess emissions have occurred. LCS 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 National Ambient Air Quality Standards (NAAQS) for the criteria pollutant subject to the permit requirements of Article 6 (PM2.5). Other criteria pollutants (NOx, CO, VOC, and PM10) were also included in the modeling analysis. For the impact of the project on VOC concentrations, a quantitative analysis was performed in accordance with current EPA guidance. Modeling was completed by MVP 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 concentration (SAAC) for any Virginia air toxic that has the potential to be emitted over the Article 6 regulatory threshold (formaldehyde). Hourly hexane emissions were also evaluated. Modeling was completed by MVP and submitted to the Office of Air Quality Assessments for analysis. The modeling analysis was approved on July 9, 2020 and demonstrated compliance with the applicable NAAQS and SAAC requirements.

PUBLIC PARTICIPATION ACTIVITIES

Regulatory Requirements:

9VAC5-80-1170D states that prior to a decision of the board, minor NSR permit applications that have the potential for public interest concerning air quality, as determined by the board, shall be subject to a public comment period of at least 30 days. At the end of the public comment period, a public hearing shall be held according to 9VAC5-80-1170E.

§10.1-1307.01 B of the Air Pollution Control Board law requires the following, before granting a permit for a new fossil fuel fired compressor station facility used to transport natural gas if the Board finds that there is a locality particularly affected by such a permit:

- the applicant must publish a notice in at least one local paper of general circulation in any locality particularly affected at least 60 days prior the close of the public comment period. DEQ shall post such notice on the Department website and on a Department social media account.
- the applicant must mail the notice to the chief elected official of, chief administrative officer of, and planning district commission for Pittsylvania County; every public library and public school located within five miles of the Station; and the owner of each parcel of real property that is depicted as adjacent to the facility on the current real estate tax assessment maps of the locality.
- Written comments shall be accepted by the Board for at least 30 days after any hearing on such variance or permit.

The following, non-regulatory required additional public participation steps were taken:

- A virtual informational briefing was held. The briefing included a summary of the proposed permit for the LCS facility and provided the public an opportunity to ask questions which were addressed by DEQ. Notice of the informational briefing was provided 22 days prior to the briefing.
- The public comment period was extended 30 additional days for a total of 91 days.
- In addition to publishing the public notice in the local newspaper, DEQ website and social media account, the following was conducted:
    - The public notice was sent via regular mail and email to individuals and organizations that have signed up to receive public notices for other types of air permits (Title V and PSD) and to Native American tribes.
    - DEQ attended a virtual meeting of the Pittsylvania County NAACP where we provided an overview of the proposed permit and answered questions.
    - The public notice was sent via regular mail and email to local stakeholders identified from publicly available data including: places of worship, child care centers, colleges/universities, courthouses, nursing homes, libraries, bookmobile and schools.
    - Announcements were posted on social media (Twitter, Facebook, Nextdoor, and Constant Contact.
    - A radio public service announcement was issued.
    - Reminders of the public comment period, briefing, hearing and the extension of the public comment period were sent using postal mail, email and social media.
    - Draft permit, engineering analysis and a fact sheet was sent to public local libraries

The Public Notice for the proposed LCS facility appeared in the *Chatham Star-Tribune* on December 16, 2020, announcing an informational briefing on January 7, 2021; a comment period from January 8, 2021 to March 10, 2021 (61 days); and a public hearing on February 8, 2021.

Near the end of the comment period, DEQ Director extended the comment period to April 9, 2021 and determined the draft permit would be considered by the State Air Pollution Control Board directly. A Public Notice announcing the extended comment period was published in the *Chatham Star-Tribune* newspaper and sent to same extended contact lists mentioned above.

Applicant Public Notice

In accordance with §10.1-1307.01 B of the Virginia Air Pollution Control Law, MVP published a notice in the *Chatham Star-Tribune* on January 6, 2021. Copies of the notice were also sent to: the chief elected official of, chief administrative officer of, and planning district commission for Pittsylvania County; every public library and public school located within five miles of the Station; and the owner of each parcel of real property that is depicted as adjacent to the facility on the current real estate tax assessment maps of the locality.

Public Hearing

The public hearing had 168 attendees (49 spoke), 26 of which were DEQ employees or applicant representatives. Forty-nine members of the public provided oral comment on the proposed LCS. A total of sixteen commenters supported the facility construction, DEQ's analysis of the application, and development of the draft permit and twenty-four provided comments opposing the proposed facility construction and DEQ's draft permit.

Public Comment Period

The public comment period for the draft permit occurred January 8, 2021 to April 9, 2021. A total of 300 comments were received during that time. Comments concerning the proposed LCS were received from various organizations that opposed or supported construction of the facility. Special interests groups such as: Sierra Club, Blue Ridge Environmental Defense League, NAACP (County and State), Alliance to Protect People and Places We Live (APPPL), Chesapeake Climate Action, Appalachian Voices, Protect Our Water Heritage Rights (POWHR), and Dan River Basin Association opposed the approval of the LCS draft permit. Conversely, organizations such as Virginia Chamber of Commerce, Pittsylvania Board of Supervisors, Danville Pittsylvania Regional Industrial Authority, Virginia Foundation for Research & Economic Education, Chatham Fire Department, and Danville Community College Workforce Services were in favor of passing the station's draft permit. Several emails were received more than once from the same individual. These emails either repeated or rephrased the original comment with new content or were a note of personal expression. Some comments did not comply with the guidelines listed in 9VAC5-80-1170 F, while other comments were not affiliated with issues related to this subject matter. The remaining comments received were from citizens throughout the state of Virginia, North Carolina, Maryland, Florida, Oklahoma, Colorado and California. A total of 278 comments requested State Air Pollution Control Board review.

Copies of DEQ's Public Participation Report (Attachment E), Summary of and Response to Comments (Attachment F) are attached.

Changes to the Draft Permit

One change to the draft permit was made. Initial performance testing inadvertently omitted NOx from the list of pollutants. This was an unplanned omission and was corrected. The engineering analysis has been updated to reflect the public comment period dates, clarify emission factors, and to correct typographical errors.

SUPPORTING DOCUMENTATION

Immediately following this agenda memo are the following documents:

A. Draft Permit (clean copy)
B. Draft Permit (with track changes)
C. Draft Permit Engineering Analysis
D. Air Quality Analyses Review
E. Public Participation Report (including representative sample of comments received)
F. Summary of and Response to Public Comments

RECOMMENDATION

The Board approve the proposed permit with the changes to the engineering analysis.

ATTACHMENT B - DRAFT PERMIT (WITH TRACK CHANGES)

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

BLUE RIDGE REGIONAL OFFICE
901 Russell Drive, Salem, Virginia 24153
(540) 562-6700 FAX (804) 698-4178
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

Robert J. Weld
Regional Director

12/16/2020 DRAFT (revised)

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,

Mountain Valley Pipeline, LLC
2200 Energy Drive
Canonsburg, PA 153172
Registration No.: 21652

is authorized to construct and operate

a natural gas compressor station (Lambert Compressor Station)

located at

987 Transco Road in Chatham, Virginia 24531

in accordance with the Conditions of this permit.

Approved on DRAFT.

_____

Robert J. Weld
Regional Director

Permit consists of 2323 pages.
Permit Conditions 1 to 58.
Attachment - Source Testing Report Format, 1 page

INTRODUCTION

This permit approval is based on the permit applications dated November 5, 2018, including supplemental information dated December 12, 2018, April 24, 2019, June 2, 2020, and August 12, 2020 and September 2, 2020. 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 9VAC5-10-20 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 9VAC5-170-60 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 covered by this permit consists of:

Equipment included in the project:

Reference No.	Equipment Description	Rated Capacity	Delegated Federal Requirements
CT-01	Solar Mars Combustion Turbine Model 100	16,610 hp*	40 CFR 60, Subpart KKKK
CT-02	Solar Taurus Combustion Turbine Model 70	11,146 hp*	40 CFR 60, Subpart KKKK
MT-01	Capstone Microturbine Model C200	200 kW	---
MT-02	Capstone Microturbine Model C200	200 kW	---
MT-03	Capstone Microturbine Model C200	200 kW	---
MT-04	Capstone Microturbine Model C200	200 kW	---
MT-05	Capstone Microturbine Model C200	200 kW	---
FUG	Fugitive natural gas leaks from fugitive emission components	---	---

*Based on ambient temperature of 0°F and 100% operating load.

Specifications included in the above table 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 combustion turbines (CT-01, CT-02) shall be controlled by dry low NO_x (SoLoNO$_x$™) combustion control technology and a selective catalytic reduction (SCR) system. The SCR system shall be designed to reduce NOx emissions to an outlet concentration of 2.70 ppmvd as a 3-hour average when the compressor turbine's inlet air temperature is 0°F or greater. The SoLoNO$_x$™ technology shall be in operation at all times the respective combustion turbine is operating except during start-up and shutdown, as defined in Condition 4.

   a. When a combustion 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. No combustion turbine shall operate below 50% load except during startup and shutdown.

   b. Each combustion turbine shall be equipped with Pilot Active Control Logic (PACL) to minimize emissions when inlet air temperature is less than 0°F and the PACL shall be in operation when the respective combustion turbine is operating.

   c. Each SCR system shall be in operation at all times the respective combustion turbine is operating, except during start-up and shutdown where operation shall be as described in Condition 4.e.

   (9VAC5-80-1180)

2. **Emission Controls** – Carbon Monoxide (CO) and Volatile Organic Compound (VOC) emissions from the combustion turbines (CT-01, CT-02) 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 combustion turbine is operating, except as outlined in Condition 4.
   (9VAC5-80-1180)

3. **Emission Controls** – Particulate emissions (PM, PM_{10}, $PM_{2.5}$) from the combustion turbines (CT-01, CT-02) and microturbines (MT-01 – MT-05) shall be controlled by inlet air filters. Each filter shall be provided with adequate access for inspection and shall be in operation at all times the respective combustion turbine is operating.
   (9VAC5-50-260[1] and 9VAC5-80-1180)

4. **Emission Controls** – The permittee shall operate and maintain each combustion turbine (CT-01, CT-02), 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.

---

[1] 9VAC5-50-260 (BACT) applies to $PM_{2.5}$.

a. For the purpose of this permit, start-up is defined as the period beginning with the first fuel fed to the combustion turbine and ending when the combustion turbine reaches 50% load.

b. For the purpose of this permit, shutdown is defined as the period beginning when the combustion 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 600°F or the minimum combustion chamber temperature derived from the most recent performance test that demonstrates compliance with this permit.

d. The oxidation catalyst system shall be in operation during the shutdown of the respective combustion turbine.

e. During start-up and shutdown, each combustion 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 combustion turbine shall not exceed 17.32 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 combustion turbine shall not exceed 17.32 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 combustion turbine shall operate in "SoLoNOx mode" at all times except for start-up, shutdown, and when a combustion turbine's inlet air temperature is less than 0°F. Operation not in "SoLoNOx mode" shall not exceed an annual total of 24.0 hours per combustion 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.

(9VAC5-50-260 and 9VAC5-80-1180)

5. **Emission Controls** – Nitrogen oxides (NO_x) emissions from the microturbines (MT-01 – MT-05) shall be controlled by dry low NO_x (DLN) combustion control technology. The DLN technology shall be in operation at all times the respective microturbine is operating. (9VAC5-80-1180)

6. **Emission Controls** – The permittee shall implement the following work practices to reduce emissions from venting of natural gas from the facility.

   a. 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.

   b. Except as provided in Condition 6.f, the permittee shall control emissions from the shutdown of each combustion turbine by maintaining pressurized hold for the combustion turbine. Pressurized hold shall be achieved by maintaining sufficient differential pressure between the seal gas and combustion turbine case such that the dry seal maintains integrity for the entire duration of the shutdown. Sufficient differential pressure shall be determined for each combustion turbine during the tests required in Condition 34.

   c. Pig launching and recovery shall be limited to two events each per 12-month period. 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. The permittee shall install a vent gas reduction system (VGRS) to ensure the sufficient differential pressure required in Condition 6.b 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 combustion turbine case such that the dry seal is maintained for the respective combustion turbine in compliance with Condition 6.f.

   e. The permittee shall continuously monitor and record the seal gas pressure and combustion turbine case pressure for each combustion turbine during pressurized holds.

   f. For each combustion turbine, the permittee shall vent gas no more than twelve (12) times per year, calculated monthly as the sum of each consecutive 12-month period. A combustion turbine may not vent gas unless the combustion turbine case pressure is less than or equal to 44.7 psia (30 psig). The permittee shall ensure isolation valves are closed and record the combustion turbine case pressure at the beginning of each

combustion turbine shutdown venting event. The permittee shall minimize the amount of time for each combustion turbine start-up purge.

(9VAC5-80-1180)

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. Daily AVO should be conducted at least five days per week. 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 3 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 Blue Ridge Regional Office for review and approval 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.

   e. A summary of the results of the daily AVO and quarterly LDAR surveys shall be submitted with the reports required in Condition 41 detailing leaks detected, any

corrective actions taken to address and minimize the leaks, and the dates of leak discovery and leak repair.

(9VAC5-80-1180)

8. **Monitoring Devices** – Each microturbine (MT-01 - MT-05) shall be equipped with devices to continuously measure and record combustion turbine inlet air temperature and combustion turbine load. 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 combustion turbine is operating.
(9VAC5-50-20 C and 9VAC5-80-1180)

9. **Monitoring Devices** – Each combustion turbine (CT-01, CT-02) shall be equipped with devices to continuously measure and record combustion turbine inlet air temperature, combustion turbine load, and "SoLoNOx" 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 combustion turbine is operating.
(9VAC5-50-20 C and 9VAC5-80-1180)

10. **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.
(9VAC5-50-20 C and 9VAC5-80-1180)

11. **Monitoring Devices** – Each combustion turbine shall be equipped with devices to continuously measure and record the seal gas supply pressure, the seal gas differential pressure, and the combustion 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.
(9VAC5-50-20 C and 9VAC5-80-1180)

12. **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.
(9VAC5-50-20 C and 9VAC5-80-1180)

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, 10, 11, 12, and 16. The plan shall include ranges for each parameter. The range values shall be established during the initial performance tests required in Condition 30 and revalidated during the subsequent performance tests required in Condition 32. Ranges shall be 3-hour rolling averages. The monitoring plan shall be submitted to the Blue Ridge Regional Office with the test results as required in Condition 30.
(9VAC5-50-20 C and 9VAC5-80-1180)

OPERATING LIMITATIONS

14. **Fuel** – The approved fuel for the combustion turbines (CT-01, CT-02) and microturbines (MT-01 – MT-05) is pipeline natural gas. A change in the fuel shall be considered a change in the method of operation of the combustion turbines and microturbines and may require a new or amended permit. However, if a change in the fuel is not subject to new source review permitting requirements, this condition should not be construed to prohibit such a change.
(9VAC5-50-260 and 9VAC5-80-1180)

15. **Fuel Specification** – The pipeline natural gas shall not exceed a sulfur content of 1.1 grains of sulfur per 100 standard cubic feet.
(9VAC5-80-1180)

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 Blue Ridge 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 Blue Ridge Regional Office no later than 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-50-410 and 9VAC5-80-1180)

17. **Requirements by Reference** – Except where this permit is more restrictive than the applicable requirement, the combustion turbines (CT-01, CT-02) as described in the Introduction shall be operated in compliance with the requirements of 40 CFR 60, Subpart KKKK.
(9VAC5-50-400, 9VAC5-50-410, and 9VAC5-80-1180)

EMISSION LIMITS

18. **Emission Limits** – Hourly emissions from the operation of EACH microturbine (MT-01 thru MT-05) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	0.08 lb/hr
Carbon Monoxide	0.22 lb/hr
Volatile Organic Compounds	0.02 lb/hr
$PM_{2.5}$	0.02 lb/hr

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 3, 5, 14, 31, and 40.
(9VAC5-50-260[2] and 9VAC5-80-1180)

19. **Emission Limits** – Annual emissions from the COMBINED operation of the microturbines (MT-01 – MT-05) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	1.81 ton/yr
Carbon Monoxide	4.79 ton/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. 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 3, 5, 14 and 40.
(9VAC5-80-1180)

20. **Emission Limits** – Emissions from the operation of the Solar Mars 100 combustion turbine (CT-01) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	2.70 ppmv @15% O_2*	1.33 lb/hr*	6.09 ton/yr
Carbon Monoxide	2.00 ppmv @15% O_2*	0.60 lb/hr*	6.30 ton/yr
Volatile Organic Compounds	0.50 ppmv @15% O_2*	0.09 lb/hr*	0.63 ton/yr
PM		1.36 lb/hr*	5.95 ton/yr

[2]9VAC5-50-260 applies to PM2.5.

PM_{10}	1.36 lb/hr*	5.95 ton/yr
$PM_{2.5}$	1.36 lb/hr*	5.95 ton/yr
Sulfur Dioxide	0.71 lb/hr*	3.09 ton/yr

*Limits are a 3-hour average and do not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. The NO_x emission rates for startup/shutdown periods and low temperature operating mode (< 0°F and ≥ 50% load) are listed in Condition 22.

These emissions are derived from the estimated overall emission contribution from operating limits. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period and shall include startup and shutdown periods, and when ambient temperatures are below 0°F as applicable. 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, 3, 4, 30, 32 and 40. (9VAC5-50-260[3] and 9VAC5-80-1180)

21. **Emission Limits** – Emissions from the operation of the Solar Taurus 70 combustion turbine (CT-02) shall not exceed the limits specified below[1]:

Nitrogen Oxides (as NO_2)	2.70 ppmvd @15% O_2*	0.90 lb/hr*	4.16 ton/yr
Carbon Monoxide	2.00 ppmvd @15% O_2*	0.41 lb/hr*	5.93 ton/yr
Volatile Organic Compounds	0.50 ppmvd @15% O_2*	0.06 lb/hr*	0.94 ton/yr
PM		0.93 lb/hr*	4.06 ton/yr
PM_{10}		0.93 lb/hr*	4.06 ton/yr
$PM_{2.5}$		0.93 lb/hr*	4.06 ton/yr
Sulfur Dioxide		0.48 lb/hr*	2.11 ton/yr

*Limits are a 3-hour average and do not apply during periods of start-up, shutdown, or when ambient temperatures are below 0°F. The NO_x emission rates for startup/shutdown periods and low temperature operating mode (< 0°F and ≥ 50% load) are listed in Condition 23.

[3]9VAC5-50-260 applies to $PM_{2.5}$.

These emissions are derived from the estimated overall emission contribution from operating limits. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period and shall include startup and shutdown periods, and when ambient temperatures are below 0°F as applicable. 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, 3, 4, 30, 32 and 40. (9VAC5-50-260[4] and 9VAC5-80-1180)

22. **Emission Limits for Non-Standard Operating Modes** – Emissions during start-up, shutdown, and low temperature mode from the Solar Mars 100 combustion turbine (CT-01) shall not exceed the limits specified below:

	Start-up	Shutdown	Low Temp Mode (<0 °F)
Nitrogen Oxides (as NO_2)	1.00 lb/event	1.00 lb/event	21.28 lb/hr

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 this emission limit may be determined as stated in Conditions 35 and 40.
(9VAC5-80-1180)

23. **Emission Limits for Non-Standard Operating Modes** – Emissions during start-up, shutdown, and low temperature mode from the Solar Taurus 70 combustion turbine (CT-02) shall not exceed the limits specified below:

	Start-up	Shutdown	Low Temp Mode (<0 °F)
Nitrogen Oxides (as NO_2)	1.00 lb/event	1.00 lb/event	14.42 lb/hr

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 this emission limit may be determined as stated in Conditions 35 and 40.
(9VAC5-80-1180)

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

Fugitive Emissions Components	0.75 ton/yr
Combined Combustion Turbine Venting (Start-up and Shutdown)[5]	0.12 ton/yr

[4]9VAC5-50-260 applies to $PM_{2.5}$.
[5]Combined venting includes emission activities from turbine startup and shutdowns, pigging and filter maintenance.

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, 34, and 40.
(9VAC5-80-1180)

25. **Visible Emission Limit** – Visible emissions from each combustion turbine (CT-01, CT-02) shall not exceed 5% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A).
(9VAC5-50-260 and 9VAC5-80-1180)

26. **Visible Emission Limit** – Visible emissions from each microturbine (MT-01 – MT-05) shall not exceed 5% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A).
(9VAC5-50-260 and 9VAC5-80-1180)

27. **Visible Emission Limit** – Visible emission observations from each combustion turbine (CT-01, CT-02) 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.
(9VAC5-80-1180)

28. **Visible Emission Limit** – Visible emission observations from each microturbines (MT-01 – MT-05) 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.
(9VAC5-80-1180)

TESTING

29. **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.
(9VAC5-50-30 F and 9VAC5-80-1180)

30. **Stack Test** – Initial performance tests shall be conducted for NOx, CO, VOC, PM_{10}, and $PM_{2.5}$ from each combustion turbine (CT-01, CT-02) to determine compliance with the emission limits contained in Conditions 20 and 21. The tests shall be performed 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 9VAC5-50-30, and the test methods and procedures contained in each applicable section or subpart listed in 40CFR Part 51 Appendix M or 9VAC5-50-410. The details of the tests are to be arranged with the Blue Ridge 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 Blue Ridge Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-50-30 and 9VAC5-80-1200)

31. **Stack Test** – Initial performance tests shall be conducted for NO_x, CO, VOC, and PM2.5 from each microturbine (MT-01 – MT-05) to determine compliance with the emission limits contained in Condition 18. The tests shall be performed 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 9VAC5-50-30, and the test methods and procedures contained in each applicable section or subpart listed in 9VAC5-50-410. The details of the tests are to be arranged with the Blue Ridge 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 Blue Ridge Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-50-30 and 9VAC5-80-1200)

32. **Stack Test** – The permittee shall repeat the performance tests contained in Condition 30 every two years to determine compliance with the emission limits contained in Condition 20. 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 Blue Ridge Regional Office no later than 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-50-30 and 9VAC5-80-1200)

33. **Visible Emissions Evaluation** – Concurrently with the initial performance tests in Conditions 30 and 31 and subsequent performance tests in Conditions 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 Blue Ridge Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. The initial test shall be performed 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 Blue

Ridge 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 Blue Ridge Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-50-30 and 9VAC5-80-1200)

34. **VGRS Evaluation** - The permittee shall ensure proper operation and maintenance of the pressurized hold required in Condition 6.b by performing an evaluation for each combustion 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 combustion 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 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 and demonstrate compliance thereafter at a period not to exceed 13 months from the preceding evaluation. One copy of the test results shall be submitted to the Blue Ridge Regional Office within 60 days after test completion. The test report shall conform to the test report format enclosed with this permit and shall include the established pressure ranges.
(9VAC5-50-30 and 9VAC5-80-1200)

CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS)

35. **CEMS** - Continuous Emission Monitoring Systems, meeting the design specifications of 40 CFR Part 60, Appendix B, shall be installed to measure and record the emissions of nitrogen oxides (NOx) and the oxygen content of the exhaust gas from the combustion turbine (CT-01, CT-02) stack as ppmvd corrected to 15% O_2. Except where otherwise approved by the DEQ, the CEMS shall be installed, calibrated, maintained, audited and operated in accordance with the requirements of 40 CFR 60.13, 40 CFR 60, Subpart KKKK and 40 CFR 60, Appendices B and F. Data shall be reduced to 3-hour rolling averages, using procedures approved by the Blue Ridge Regional Office.
(9VAC5-50-40 and 9VAC5-80-1180)

36. **CEMS Performance Evaluations** - Performance evaluations of the CEMS shall be conducted in accordance with 40 CFR Part 60, Appendix B, and shall take place during the performance tests required by Conditions 30 and 32 or within 30 days thereafter. One copy of the performance evaluations report shall be submitted to the DEQ within 45 days of the evaluation. The CEMS shall be installed and operational prior to conducting initial performance tests. Verification of operational status shall, as a minimum, include completion of the manufacturer's written requirements or recommendations for installation, operation and calibration of the device. A 30 day notification, prior to the demonstration of

the CEMS performance, and subsequent notifications, shall be submitted to the Blue Ridge Regional Office.
(9VAC5-80-1180 and 9VAC5-50-40)

37. **CEMS Quality Control Program** - A CEMS quality control program which is equivalent to the requirements of 40 CFR 60.13 and 40 CFR 60 Appendix F shall be implemented for all continuous emissions monitoring systems.
(9VAC5-80-1180 and 9VAC5-50-40)

38. **CEMS Excess Emissions and Monitor Downtime for NO_x** - For the purpose of this permit, periods of excess emissions and monitor downtime that must be reported under Condition 39 are defined as follows:

    a. An excess emission is any unit operating period in which the 3-hour rolling average NO_x emission rate exceeds the applicable emission limit in Condition 20 and

    b. A period of monitor downtime is any unit operating hour in which the data for any of the following parameters are either missing or invalid: NO_x concentration, O_2 concentration and fuel flow rate.

    (9VAC5-50-50 and 9VAC5-50-410)

39. **CEMS Reports** - The permittee shall furnish written reports to the DEQ of excess emissions from any process monitored by a CEMS with the reports required in Condition 41. These reports shall include, but are not limited to the following information:

    a. The magnitude of excess emissions, any conversion factors used in the calculation of excess emissions, and the date and time of commencement and completion of each period of excess emissions;

    b. Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the process, the nature and cause of the malfunction (if known), the corrective action taken or preventative measures adopted;

    c. The date(s) and time(s) identifying each period during which the CEMS was inoperative except for zero and span checks and the nature of the system repairs or adjustments; and

    d. When no excess emissions have occurred or the CEMS have not been inoperative, repaired or adjusted, such information shall be stated in that report.

    (9VAC5-80-1180 and 9VAC5-50-50)

RECORDS AND REPORTING

40. **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 Blue Ridge Regional Office. These records shall include, but are not limited to:

    a. Monthly and annual consumption of natural gas for the combustion turbines (CT-01, CT-02) and microturbines (MT-01 – MT-05). 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, 13 and 16.

    c. Records for each event when a combustion turbine (CT-01 or CT-02) does not operate in "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 turbine vendors (Solar) for all parameters and their ranges that are relevant to the "SoLoNOx mode" determination.

    e. Records of fuel quality characteristics to demonstrate compliance with Condition 15.

    f. Monthly emissions calculations for NO_x, CO, VOC, $PM_{2.5}$, and SO_2 from each unit at the facility using calculation methods approved by the Blue Ridge Regional Office to demonstrate compliance with the annual emission limitations in Conditions 19, 20, 21 and 24.

    g. Scheduled and unscheduled maintenance and operator training.

    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, combustion turbine start-up purge, and combustion turbine shutdown venting.

    i. Records of the time, date, and duration of each combustion turbine start-up and shutdown event.

    j. Results of all stack test data, VGRS evaluations, and visible emissions evaluations.

    k. CEMS calibrations, calibration checks, percent operating time, and excess emissions.

l. The occurrence and duration of any periods during which a CEMS is inoperative.
m. A summary of any corrective maintenance taken.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.
(9VAC5-80-1180 and 9VAC5-50-50)

41. **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 the Blue Ridge Regional Office no later than March 1 and September 1 of each calendar year. This report must be signed by a responsible official, consistent with 9VAC5-20-230. 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;

c. Failure to meet monitoring, recordkeeping, or reporting requirements contained in this permit;

d. Summary results of the daily AVO and quarterly LDAR surveys required in Condition 7; and

e. Excess emission reports required in Condition 39.

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.
(9VAC5-80-1180 and 9VAC5-50-50)

NOTIFICATIONS

42. **Initial Notifications** – The permittee shall furnish written notification to the Blue Ridge Regional Office of:

a. The actual date on which construction of the combustion turbines (CT-01 and CT-02) and the microturbines (MT-01 – MT-05) commenced within 30 days after such date.

b. The anticipated start-up date of the combustion turbines (CT-01 and CT-02) and the microturbines (MT-01 – MT-05) postmarked not more than 60 days nor less than 30 days prior to such date.

c. The actual start-up date of the combustion turbines (CT-01 and CT-02) and the microturbines (MT-01 – MT-05) 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 42.a, and 42.b through 42.d above are to be sent to:

Chief, Air Section
Enforcement & Compliance Assurance Division
Air, RCRA and Toxics Branch
US EPA Region 3
1650 Arch Street – 3ED21
Philadelphia, PA 19103

(9VAC5-50-50 and 9VAC5-80-1180)

GENERAL CONDITIONS

43. **Permit Invalidation** – This permit to construct the combustion turbines (CT-01, CT-02) and the microturbines (MT-01 – MT-05) 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.

(9VAC5-80-1210)

44. **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.

(9VAC5-80-1210 G)

45. **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.
(9VAC5-170-130 and 9VAC5-80-1180)

46. **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.
(9VAC5-50-20 E and 9VAC5-80-1180 D)

47. **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.
(9VAC5-20-180 J and 9VAC5-80-1180 D)

48. **Notification for Facility or Control Equipment Malfunction** – The permittee shall furnish notification to the Blue Ridge 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 Blue Ridge Regional Office.
(9VAC5-20-180 C and 9VAC5-80-1180)

49. **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.
(9VAC5-20-180 I and 9VAC5-80-1180)

50. **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 Blue Ridge Regional Office of the change of ownership within 30 days of the transfer.
(9VAC5-80-1240)

51. **Permit Copy** – The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9VAC5-80-1180)

STATE-ONLY ENFORCEABLE (SOE) REQUIREMENTS

The following terms and conditions are included in this permit to implement the requirements of 9VAC5-40-130 et seq., 9VAC5-50-130 et seq., 9VAC5-60-200 et seq. and/or 9VAC5-60-300 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.

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

CT-01	0.40 lb/hr*	0.35 ton/yr
CT-02	0.27 lb/hr*	0.32 ton/yr
MT-01 – MT-05	0.04 lb/hr	0.15 ton/yr
HT-01	5.7E-05 lb/hr	2.5E-04 ton/yr
Total Facility	0.71 lb/hr	0.82 ton/yr

* Limit applies only when ambient temperatures are greater than or equal to 0°F and the turbine is operating at greater than or equal to 50% load – not during start-up or shutdown.

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, 6, 55, 56, and 58.
(9VAC5-60-320, 9VAC5-80-1120F, and 9VAC5-80-1180)

53. **(SOE) Emission Limits** – Start-up and shutdown emissions of Formaldehyde (CAS# 50-00-0) from CT-01, shall not exceed the limits specified below:

Start-up	2.4 lb/event	0.27 lb/hr
Shutdown	4.3 lb/event	0.49 lb/hr

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, 55, 56, and 58.
(9VAC5-60-320, 9VAC5-80-1120F, and 9VAC5-80-1180)

54. **(SOE) Emission Limits** – Start-up and shutdown emissions of Formaldehyde (CAS# 50-00-0) from CT-02, shall not exceed the limits specified below:

Start-up	4.6 lb/event	0.53 lb/hr
Shutdown	3.2 lb/event	0.37 lb/hr

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, 55, 56, and 58.
(9VAC5-60-320, 9VAC5-80-1120F, and 9VAC5-80-1180)

55. **(SOE) Stack Test** – Concurrently with the performance tests in Conditions 30 and 32, initial performance tests shall be conducted for formaldehyde from the compressor turbines (CT-01, CT-02) to determine compliance with the emission limits contained in Condition 52. The tests shall be performed 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 9VAC5-60-30, and the test methods and procedures contained in each applicable section or subpart listed in 9VAC5-60-100. The details of the tests are to be arranged with the Blue Ridge 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 Blue Ridge Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-60-30, 9VAC5-80-1120F, and 9VAC5-80-1180)

56. **(SOE) Stack Test** – Concurrently with the performance tests in Condition 31, initial performance tests shall be conducted for formaldehyde from the microturbines (MT-01 – MT-05) to determine compliance with the emission limit contained in Condition 52. The tests shall be performed 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 9VAC5-60-30, and the test methods and procedures contained in each applicable section or subpart listed in 9VAC5-60-100. The details of the tests are to be arranged with the Blue Ridge 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 Blue Ridge Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-60-30, 9VAC5-80-1180, and 9VAC5-80-1120F)

57. **(SOE) 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 the maximum hexane content for the natural gas being fired at the natural gas compressor station facility. 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 Blue Ridge 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 Blue Ridge Regional Office

no later than 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9VAC5-80-1120F and 9VAC5-80-1180)

58. **(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 and approved by the Blue Ridge Regional Office. These records shall include, but are not limited to:

    a. Hourly, monthly, and annual emissions (in pounds and tons) of formaldehyde to demonstrate compliance with the emissions limitations in Conditions 52, 53, and 54. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.

    b. Results of all stack test data.

    c. Hexane content documentation or hexane analysis results to demonstrate compliance with Condition 57.

    These records shall be available for inspection by the Blue Ridge Regional Office and shall be current for the most recent five years.
    (9VAC5-60-50, 9VAC5-80-1120F and 9VAC5-80-1180)

SOURCE TESTING REPORT FORMAT

Report Cover

1. Plant name and location
2. Units tested at source (indicate Ref. No. used by source in permit or registration)
3. Test Dates.
4. Tester; name, address and report date

Certification

1. Signed by team leader/certified observer (include certification date)
2. Signed by responsible company official
3. *Signed by reviewer

Copy of approved test protocol

Summary

1. Reason for testing
2. Test dates
3. Identification of unit tested & the maximum rated capacity
4. *For each emission unit, a table showing:
   a. Operating rate
   b. Test Methods
   c. Pollutants tested
   d. Test results for each run and the run average
   e. Pollutant standard or limit
5. Summarized process and control equipment data for each run and the average, as required by the test protocol
6. A statement that test was conducted in accordance with the test protocol or identification & discussion of deviations, including the likely impact on results
7. Any other important information

Source Operation

1. Description of process and control devices
2. Process and control equipment flow diagram
3. Sampling port location and dimensioned cross section Attached protocol includes: sketch of stack (elevation view) showing sampling port locations, upstream and downstream flow disturbances and their distances from ports; and a sketch of stack (plan view) showing sampling ports, ducts entering the stack and stack diameter or dimensions

Test Results

1. Detailed test results for each run
2. *Sample calculations
3. *Description of collected samples, to include audits when applicable

Appendix

1. *Raw production data
2. *Raw field data
3. *Laboratory reports
4. *Chain of custody records for lab samples
5. *Calibration procedures and results
6. Project participants and titles
7. Observers' names (industry and agency)
8. Related correspondence
9. Standard procedures

* Not applicable to visible emission evaluations

ATTACHMENT C - DRAFT PERMIT ENGINEERING ANALYSIS

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office
INTRA-AGENCY MEMORANDUM
Engineering Analysis

Permit Writer	Anita Walthall			
Air Permit Manager	Paul Jenkins			
Memo To	Air Permit File	**Date**	06/16/2021	
Facility Name	MVP Southgate Project – Lambert Compressor Station			
Registration Number	**21652**	**Application #**		**1**
Date Fee Paid	11/8/2018	**Amount ($)**		3,000.00
Distance to Class I Areas	173.12	**SNP (km)**	65.68	**JRF (km)**
FLM Notification (Y/N)	N	**Required if less than 10K (minor), 100K (state major)**		
Application Fee Classification (Title V, Synthetic Minor, True Minor)	True Minor	**Before permit action**	True Minor	**After permit action**
Permit Writer Signature				
Permit Manager Signature				

I. Introduction & Background

Mountain Valley Pipeline, LLC ("the applicant") of Pittsburgh, PA submitted an application dated November 5, 2018 (received November 8, 2018) to construct and operate a natural gas compressor station, known as Lambert Compressor Station ("LCS", or "Station") in Pittsylvania County, Virginia. The Lambert Compressor Station will be located at 987 Transco Road in Chatham, Virginia (off Route 57). The site was visited by DEQ Air Compliance and an initial site suitability evaluation reported on August 8, 2020.

The operating equipment in Section II will be powered by natural gas supplied by the Mountain Valley pipeline. The application proposes to construct a natural gas pipeline (H-650) to, according to the applicant, provide access to new natural gas supplies to meet the growing needs of natural gas users in the southeastern United States, including a local distribution company serving customers in North Carolina. Additional material was submitted dated December 12, 2018 (received 12/14/2018) and April 24, 2019 (received April 25, 2019); a modeling protocol dated October 19, 2018; a revised modeling protocol and report dated June 30, 2020; and revised application information dated June 2, 2020 (received June 30, 2020), August 12, 2020 (received August 13, 2020) and September 2, 2020 (received September 16, 2020). The application was deemed complete September 16, 2020.

As part of the application, new sources are required to submit a local governing body form to the county's zoning official for approval. The Pittsylvania County Board of Supervisors determined the Lambert Compressor Station to be exempt according to Pittsylvania County zoning ordinance PCC §35-50.

Site Suitability

The Lambert Compressor Station will be located on a site that is considered suitable from an air pollution perspective. The immediate area is evidenced by industrial and residential usage. The site is approximately 4,000 feet from an existing station (Transco). The nearest school is located in Chatham, Virginia, approximately 4 miles west. The nearest medical center and nursing home are also in Chatham.

A screening report was generated using EPA's EJSCREEN utility.[1] The report was based on a radii of 1, 2, and 5 mile from the proposed Station (Attachment 3). The report indicates the air quality environmental indicators for $PM_{2.5}$ and ozone ranked from the 34th to the 48th percentile for the State as the distance from the plant site increased to five miles. The Station is considered a true minor source of air pollutant emissions (uncontrolled emissions <100 tpy). Controls were required in accordance with the BACT determination and the applicant voluntarily proposed controls for pollutants not subject to BACT (Section V). DEQ requested that an environmental justice study be conducted by the source. The applicant's study included a 4-month environmental justice investigation conducted by an independent consultant identifying citizens in the area and fielding responses to the proposed construction and operation of the Station (Section XI). A copy of the applicant's study was sent to DEQ and was reviewed.

Section X describes the public participation and outreach that the proposed permit will undergo that will allow the public to comment and request information regarding the proposed project. No part of the permit decision can be finalized until DEQ has considered each of the comments received from the public on this permit action. Additional discussion of public participation can be found in Section X.

As noted in Sections V (BACT) and VII (Dispersion Modeling), the new source complies with all applicable requirements and National Ambient Air Quality Standards (NAAQS). The EPA established the NAAQS according to Sections 108 and 109 of the U.S. Clean Air Act. These sections require the EPA to list widespread air pollutants that reasonably may be expected to endanger public health or welfare, to issue air quality criteria for them that assess the latest available scientific information on nature and effects of ambient exposure to them and to set primary NAAQS to protect human health with adequate margin of safety and to set secondary NAAQS to protect against welfare effects (e.g. effects on vegetation, ecosystems, visibility, etc.). The proposed facility is not a major source for hazardous air pollutants (HAPs), however it is subject to Virginia's State Air Toxics regulations (9VAC5-60-300 et seq.) for formaldehyde emissions. Air toxics are regulated by both the EPA and Virginia. The EPA regulates these toxics as "HAPs" (see MACT section IV.E) and Virginia regulates these toxics as "State Air Toxics" (see State Only Enforceable (SOE) Requirements section IV.F). Therefore a toxic pollutant would be regulated both as a HAP and a State Air Toxic.

There are abundant regulatory and technical considerations in the application review and drafting of the air permit that require significant technical education and experience. Attachment 1 is provided as an attempt to convey a number of standard concepts and terms within the field. The information in the attachment does not reflect all of the statutory, regulatory, and legal implications but is

[1] United States Environmental Protection Agency.2019.EJSCREEN.Retrieved: 10/07/2020 from https://www.epa.gov/ejscreen.

provided as a basic explanation of some of the technical terms associated with air permit application reviews.

II. Emission Units / Process Description

The Lambert Compressor Station will consist of the following emissions/emission units:

Combustion Turbines
To provide pressure for this station, the applicant proposed to construct and operate the following natural gas-fired compressor turbines:

- One 16,610 hp (140.84 MMBtu/hr), Solar Mars 100 combustion turbine (CT-01)
- One 11,146 hp (93.03 MMBtu/hr), Solar Taurus 70 combustion turbine (CT-02)

Note: The turbine horsepower rating is based on 100% load, ambient temperature of 0°F (and 60% relative humidity).

Combustion turbines work by converting the energy in the fuel gas to mechanical energy that then powers the pipeline gas compressors. The compressors increase the pressure of the pipeline gas to enable it to move from one location to another, as the gas will flow from higher pressure to lower pressure in the pipeline. The turbines will generate mechanical energy from the combustion of natural gas fuel. Fresh atmospheric air flows through an air compressor, bringing it to higher pressure. Energy is then added by spraying fuel (pipeline natural gas) into the compressed air and igniting it so the combustion generates a high-temperature flow. This high-temperature, high-pressure gas enters a turbine, where it expands, turning a shaft that powers both the turbine's air compressor and other large centrifugal compressors that pressurize the pipeline gas.

The proposed lean-premix staged turbines are expected to emit Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), particulate matter (PM, PM_{10}, $PM_{2.5}$), Sulfur Dioxide (SO_2) and State Air Toxics. They are equipped with Solar's dry low-NOx combustion system known as SoLoNOx™, which limits the formation of NO_X by pre-mixing air and fuel prior to combustion. This system limits NO_X emissions when the turbine is operating at an ambient temperature of 0 °F or greater and at a load equal to or greater than 50%. This technology reduces nitrogen oxide (NO_X) emissions by operating at a lean burn fuel ratio (fuel to air ratios of less than 1:1). The SoLoNOx™ system does not operate during start-up or shutdown. SoLoNOx™ efficiency is diminished at low loads (less than 50% of capacity), as well as at loads greater than or equal to 50% for ambient temperatures below 0 °F. SoLoNOx™ is operating optimally when pilot active control is in "minimum" pilot mode.[2] The draft permit specifies that the combustion turbines cannot operate below 50% load, except during start-up or shutdown.

In addition to the use of SoLoNOx™, the applicant plans to voluntary install control technology to further reduce emissions from the combustion turbines. Selective catalytic reduction (SCR) technology system (70% control efficiency) is planned to achieve a NO_X exit concentration of 2.70 ppmv. Likewise, voluntary installation of an oxidation catalyst system is proposed to control CO at

[2] Solar's product information letter, (PIL-220 page dated June 4, 2020).

92% efficiency and VOCs (including State Air Toxics that are organic compounds) at 90% efficiency. The SCR system reduces NO_X emissions by injecting ammonia (NH_3) into the exhaust gas upstream of a catalyst. The compounds NO_X, NH_3, and O_2 react on the catalyst surface to form nitrogen (N_2) and water (H_2O). Oxidation catalyst systems are typically used on turbines to achieve a reduction in CO and VOC emissions. The oxidation catalyst system promotes the oxidation of CO and VOC to carbon dioxide (CO_2) and water (H_2O) as the emission stream passes through the catalyst bed. Catalyst systems need to operate above minimum temperatures to achieve the intended reactions for NO_X, CO, or VOC. Neither catalyst system will be at temperature during start-up. During shutdown, the oxidation catalyst system will remain above the reaction temperature (until the temperature of the turbine and associated equipment begins to cool). The SCR system is more complicated (i.e., requires ammonia injection at the correct stoichiometric rate as well as higher temperatures) and will not operate during shutdown.

Due to the technical considerations for operating the SoLoNOx™ system and the inability to operate the control systems during start-up and shutdown[3], there are three operating modes for the turbines:

- Normal operating mode (50%-100%), at or above 0°F inlet air temperature (Steady-state)
- Low temperature mode, operating at temperatures below 0°F (Low Temperature)
- Start-up and Shutdown mode, when power is being energized or de-energized (SUSD)

Compressor Fugitive Emissions (FUG)
Fugitive emissions at natural gas compressor stations include leaks from piping components (valves, flanges, connectors and open-ended lines). Fugitive component leak emissions were estimated using factors from the Greenhouse Gas Reporting Rule, 40 CFR 98 Table W-1A. Because piping components have a potential for leaks, the constituents in natural gas namely, VOCs and air toxics are also expected to be released into the atmosphere.

Venting and Blowdowns (BDE)
Natural gas blowdown events occur as a result of depressurization activities associated with combustion turbine start-ups and shutdowns. Pig launching and receiving events are also included with BDE activities. This event involves launching a device known as a 'pig' through the pipeline for inspection and/or cleaning. Pigging operations are expected to only occur once every five to seven years as part of normal inspection and equipment maintenance operations. The emission points during a pig launch or receiving event consist of opening valves on the launcher/receiver piping following an event in order to depressurize the piping. The cause for depressurization results in releases of natural gas during turbine start-up, turbine shutdown, pigging and, site-wide emergency shutdown (ESD) testing. VOCs and air toxics are released into the atmosphere during these events.

Microturbines

- Five, 200 kW Capstone microturbines used for facility electrical power (MT-01 to MT-05) The pollutants expected to be released from the microtubines are NO_X, CO, VOC, particulate matter ($PM_{2.5}$), and toxics.

[3] The oxidation catalyst will operate above the minimum temperature for the entirety of the shutdown sequence. Therefore, control of emissions will occur during that period.

Fuel Gas Heater

- One 0.77 MMBtu/hr gas-fired heater to preheat natural gas above dew point before combustion (HT-01)

Tanks

- Two, 10,000 gal "produced fluids" (natural gas liquids and water) storage tanks (TK-01, TK-02)
- Two, 1,000 gal (ea.) vertical high pressure aqueous ammonia storage tanks for use by each turbine's (T-70, M-100) SCR control system.

III. Emission Calculations

The application included air emission calculations for the proposed Lambert Compressor Station in Appendix B of the permit application. Those calculations have been reviewed by DEQ. Note that the applicant assumed the emission rate for PM to equal the emission rates for PM_{10} and $PM_{2.5}$ emissions. Emission calculations are shown in Attachment B (source application).

The primary pollutants emitted by combustion turbines are NO_X, CO and unburned hydrocarbons (UHC). Sulfur dioxide (SO_2), particulate matter (PM, PM_{10}, and $PM_{2.5}$) and trace levels of air toxic pollutants are a function of fuel content.[4] Emissions rates for NO_X, CO, and unburned hydrocarbons (UHC) are guaranteed by the vendor. Emission estimates for VOC (and methane) emissions are 20% of the UHC emissions[5]. The proposed facility's uncontrolled emissions are evaluated in Sections IV A and B.

The applicant determined annual permitted emissions for the combustion turbines, based on the following:

- Combustion turbines operating at 8,718.68 hours per year (each) in steady-state mode
- Low temperature emissions (for temperatures below 0°F) are estimated to occur for 24 hours per year for each turbine, and
- SUSD emissions having a total duration of 17.32 hours for each turbine (8.66 hours for SU and 8.66 hours for SD, each turbine).[6]

IV. Regulatory Review

A. 9VAC5 Chapter 80, Part II, Article 6 – Minor New Source Review

The provisions of Article 6 apply throughout Virginia to (i) the construction of any new stationary source, (ii) the construction of any project (which includes the affected emissions units), and (iii) the reduction of any stack outlet elevation at any stationary source.

9VAC5-80-1105 B through D:

The application requests approval for the construction of a new stationary source. To be exempt from permitting, the regulations require that an emissions unit cannot be subject to the provisions

[4] https://www.netl.doe.gov/sites/default/files/gas-turbine-handbook/3-2-1-2.pdf.
[5] Solar Turbines PIL 168.
[6] SUSD emissions = 52 events x 10 min/event x 1hr/60min x 2 = 17.32 hrs (each combustion turbine).

of 9VAC5-80-1105 B through D as a group, nor subject to the provisions of 9VAC5-80-1105 E and F. The proposed fuel heater (HT-01) is exempt from permitting as an external fuel combustion unit using gaseous fuel as its maximum heat input is less than 50 MMBtu/hr (9VAC5-80-1105 B.1.a(4)). Both "produced fluids" storage tanks (TK-01, TK-02) are exempt from permitting as petroleum liquids storage operations having capacity of 40,000 gallons or less (9VAC5-80-1105-B.4.b). There is an ammonia storage tank proposed for each combustion turbine (T-70, M-100). The tanks are exempt from permitting since ammonia is not a regulated air pollutant. The applicant stated no other truck loading operations will be performed at this site.

The remaining process/emissions units (combustion turbines, microturbines, BDE, and FUG) are considered in order to determine the uncontrolled emission rate (UER) from the new stationary source. For minor NSR permit applicability, the UER of criteria pollutants for a new stationary source is the sum of the new uncontrolled emissions (NUE) minus the sum of the current uncontrolled emissions (CUE) for each unit included in the project (UER = NUE – CUE) and cannot be less than zero. The combined UER is compared to the criteria pollutant exemptions levels in 9VAC5-80-1105 C.1. If the UER exceeds the exemption level for any one criteria pollutant, the project is subject to the permitting requirements of 9VAC5 Chapter 80, Article 6. For this permit action, all of the process/emissions units are new, CUE equals zero.

Combustion Turbines (CT-01, CT-02)
The proposed turbines are new emission units. The NUE is based on manufacture data for uncontrolled emissions of NO_X, CO, and VOC pollutants at maximum load and >0°F. Emissions of PM, PM_{10}, $PM_{2.5}$ and SO_2 are determined using manufacturer supplied data. The NUE for all pollutants are based on 8,760 hours per year.

Microturbines (MT-01 – MT-05)
The proposed microturbines are new emission units. The NUE for pollutants emitted by the microturbines is based on 8760 hours of operation a year. Emission factors for NO_X, CO, and VOC are vendor supplied. Emissions of PM, PM_{10}, $PM_{2.5}$ and SO_2 are based on emission factors from AP-42 Table 3.1-2a.

Venting/Blowdowns (BDE)
Blowdown or vented emissions are emissions which pass through a stack or vent. A compressor may be vented during startup, shutdown, pigging or maintenance filter activities. The NUE from venting and blowdowns are based on worst-case natural gas volume released during compressor and piping blowdown, and assumes one annual ESD system test per year. Emissions estimates considers the frequency of each operation as well as natural gas characteristics. The pollutants emitted during BDE operations are VOCs (and GHGs).

Station Fugitives (FUG)
NUE is based on leaks from the number of valves, flanges, and other gas transmission components at the proposed Station. Emissions were based on EPA emission factors (Protocol for Equipment Leak Emission Estimates" for oil and gas production operations, 11/95 (EPA-453 / R-95-017), Table 2-4, Page 2-15 and Interstate Natural Gas Association of America (INGAA) guidelines.

As shown in the summary table below, the UER for $PM_{2.5}$ exceeds the respective permitting thresholds; therefore the facility is subject to permitting requirements of Article 6. State BACT applies to $PM_{2.5}$ (see Section V).

Table 1: Project Uncontrolled Emission Rate (UER)[7]

Pollutant	UER (tpy)	Exemption Rate (tpy)	Exempt? (Y/N)
Carbon Monoxide	67.39	100	Y
Nitrogen Oxides	34.73	40	Y
Sulfur Dioxide	5.37	40	Y
PM	10.36	25	Y
PM_{10}	10.36	15	Y
$PM_{2.5}$	10.36	10	N
Volatile Organic Compounds[8]	8.95	25	Y
Lead	<0.06	0.6	Y

9VAC5-80-1105E&F:
Based on the applicant's calculations, the facility will emit two State Air Toxic pollutants of concern for compressor stations, namely hexane and formaldehyde. Potential hexane emissions were determined to be less than the exemption rates, while formaldehyde's emissions are expected to exceed the exemption thresholds according to 9VAC5-60-300. Therefore, formaldehyde is subject to minor NSR permitting and BACT, while hexane is exempt.

Table 2: Potential Emission of Toxic Pollutants

Pollutant (CAS #)	Emissions Rate (lb/hr)	Exemption Rate (lb/hr)	Emissions Rate (tpy)	Exemption Rate (tpy)	Triggers Permitting?
Formaldehyde (50-00-0)	8.990	0.0825	0.822	0.174	Yes
Hexane (110-54-3)	2.4	11.616	0.093	25.52	No

Other State Air Toxics are emitted from the combustion turbines, line heaters and storage tanks to be located at the proposed facility. However, the potential to emit of each of these pollutants does not exceed the respective individual hourly and annual exemption thresholds (Table B-12); therefore the emission are not subject to permitting requirements. See section VIIB for discussion and modeling performed.

B. 9VAC5 Chapter 80, Part II, Article 8 and Article 9 – PSD Major New Source Review and Non-Attainment Major New Source Review

The Prevention and Significant Deterioration (PSD) permit program is for major stationary sources (defined in the Regulations) located in areas that are in compliance with the National

[7] Table B-1 of June 30, 2020 submittal (uncontrolled). Note HT-01 is exempt from permitting (emissions not included).
[8] Value includes emissions from non-exempt project equipment and fugitives releases (leaking components and venting).

Ambient Air Quality Standards (NAAQS). Areas that are meeting the NAAQS are designated as "PSD areas". Areas that have ambient air concentrations higher than the NAAQS are designated as "nonattainment areas". An area's classification is determined for each pollutant with a NAAQS. These pollutants are referred as "criteria pollutants". The PSD program also applies to certain other pollutants that are regulated under the Clean Air Act.[9]

Pittsylvania County is a PSD area for all pollutants as designated in 9VAC5-20-205. LCS is not in a source category with a 100 tpy PSD threshold; therefore, the major stationary source threshold is 250 tpy. After issuance of this permit, the facility will not have a PTE of any regulated NSR pollutant at major stationary source thresholds. PSD review does not apply.

Greenhouse Gases (9VAC5 Chapters 80 and 85)
As of January 2, 2011, GHG is subject to regulation for a major modification if the project causes a significant emissions increase (SEI) and significant net emissions increase (SNEI) for GHG in addition to one other criteria pollutant. [10] GHG is not subject to regulation due to the project not having a criteria pollutant that exceeds the SNEI threshold.

C. 9VAC5 Chapter 50, Part II, Article 5 – (NSPS)
Requirements of NSPS Subparts KKKK and OOOOa are applicable to the affected equipment (or process) as identified in this section. These rules contain federally enforceable requirements that a source must comply with, regardless of their inclusion in a permit.

The proposed combustion turbines (CT-01 and CT-02) are subject to 40 CFR 60, Subpart KKKK "Standards of Performance for Stationary Combustion Turbines". This subpart establishes emission standards and compliance schedules for the control of NO_X and SO_2 emissions from stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005 (§60.4300-§60.4420). NSPS Subpart KKKK requires a NO_X emission limit of 15 ppm @15% O_2 (§60.4320) for each turbine. The permit's limit for NO_X is more stringent than the subpart's 15 ppm limit (see Section V). Monitoring, testing, and recordkeeping requirements for NO_X are required (§60.4333, §60.4340). The turbines are also subject to the fuel sulfur monitoring requirements (§60.4360).

NSPS Subpart OOOOa, "Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced after September 18, 2015" (§60.5360a-§60.5432a) applies to select equipment for the collection of fugitive emissions (60.5365a(j)). This subpart sets standards for VOCs (as well as GHGs) that require leak testing for methane and other VOC emissions. NSPS OOOOa requires a fugitive emissions monitoring plan (§60.5397a (b) through (j)); monitoring surveys (§60.5397a (f) and §60.5397a (g) (2)) and repair/replacement timeframes (§60.5397a (h)). The monitoring plan required by this permit is at least as stringent as the requirements in this rule (see Section V).

D. 9VAC5 Chapter 60, Part II, Article 1 – NESHAPS
The facility is not subject to any Part 61 (40 CFR 61) emission standards.

---

[9] BACT review for GHG emissions is required if a PSD permit is required for a criteria pollutant (6/23/14 SCOTUS decision).
[10] CO_2e is the emission rate of each GHG species multiplied by its respective global warming potential (40CFR Part 98).

E. 9VAC5 Chapter 60, Part II, Article 2 – MACT

The facility does not have the potential to emit (PTE) of any single HAP or combination of HAPs in excess of the major source threshold; therefore, it is an area source of HAPs and not subject to the "Stationary Combustion Turbine MACT" per 40 CFR Subpart YYYY. Subpart YYYY establishes emission limitations and operating limitations for HAPs emitted from stationary combustion turbines located at major sources for HAP emissions. There are no area source MACT requirements that apply to the combustion turbines and the microturbines.

F. State Only Enforceable (SOE) Requirements (9VAC5-80-1120 F)

Several Virginia regulations are enforceable only by the State Air Pollution Control Board and its designee, DEQ. One example is 9VAC5-60-300 *et seq*., also known as the "State Air Toxics rule." The State Air Toxics rule was developed as a health-based "stopgap" regulation to cover emissions of HAPs by sources until EPA made a determination regarding emissions from those source types. Once EPA has made a determination, the State Air Toxics no longer applies.

As noted in Table 2 of Section IV.A, the potential hourly and annual formaldehyde emission rates exceed the exemption thresholds contained in 9VAC5-60-300C. Formaldehyde emissions from the compressor turbines (CT-01, CT-02) will be limited in the permit to ensure the facility complies with the significant ambient air concentration (SAAC) for formaldehyde. As discussed in Section V, the facility is implementing an oxidation catalyst for VOC, as well as Vent Gas Reduction System (VGRS) and capped ESD testing. Formaldehyde is also a VOC, therefore the control requirements in the permit for VOC are considered BACT for formaldehyde (oxidation catalyst system).

Formaldehyde (CAS 50-00-0) emission limitations and associated requirements are included in the permit as SOE to implement the requirements of 9VAC5-60-300 *et. seq*. Neither the inclusion of SOE requirements in this permit nor any resulting comment period make these terms federally enforceable.

Emissions of hexane (CAS 110-54-3) were less than the exemption threshold. However the applicant modeled hexane (conservatively, at twice the estimated hexane content expected in the natural gas) and emissions were found to be in compliance with the SAAC. SOE requirement for hexane include natural gas content analysis. Neither the inclusion of SOE requirements in this permit nor any resulting comment period make these terms federally enforceable.

V. Best Available Control Technology Review (BACT)

BACT review is required for pollutants that trigger permitting (i.e., $PM_{2.5}$ and formaldehyde in this case) through the use of available reduction techniques (i.e., control devices, adjustments to prevent pollution formation, work practices, etc.) as applied to each affected emissions unit in the project proposed by the applicant (9VAC5-80-1190.1.a, 9VAC5-50-240A, and 9VAC5-50-260). BACT applies to each affected emissions unit and one of DEQ's obligations for issuing a permit approval is to ensure each emissions unit is designed to comply with BACT. This does not provide for wholesale replacement of an emissions unit, or a fundamental alteration of the emissions unit in the

application under review.[11] For this permit action, the affected emissions units subject to BACT are the natural gas-fired combustion turbines (CT-01, CT-02) and the five natural gas-fired microturbines (MT-01 – MT-05).

The applicant provided supplemental information (dated June 30, 2020) that includes an evaluation of the feasibility of using electric compressor turbines (ECT) over natural gas-fired combustion turbines and a consideration of the pollution possibility for electric compression technology. This information demonstrates that the electrical transmission infrastructure required for the use of ECTs at the proposed Station does not exist. Therefore, if the substitution of ECTs for the proposed combustion turbines was considered as a control technique in the context of a BACT determination, the use of such ECTs at the proposed Station is not an available option for consideration. An electric compressor station may or may not be an inherently lower pollutant process than a natural gas-fired compressor station. This scenario is dependent upon the fuel source for electric generation on the grid from which electric compressor station receives its electricity. If the source of the electric compressor station's electricity comes from a coal-fired power plant, the overall air pollution impact of the electric compressor station is worse than that of a natural gas-fired compressor station. However, if the electricity comes from a natural gas-fired power plant, the overall air pollution impact of an electric compressor station is likely to be approximately equal to that of a natural gas-fired compressor station. The parameters in question, electric turbines with electric transmission, are believed to fundamentally redefine the BACT approach for the proposed combustion turbines and therefore BACT does not apply. DEQ does not substitute alternative equipment for the affected emission units as part of the BACT review.

A BACT requirement considers whether an emission reduction meets BACT using various factors including the cost of the control system divided by the amount of pollutant reduced; called 'cost effectiveness'. BACT review is relative to a specific pollutant and a specific type of operation. Generally, for BACT, sources undergo a review to compare the relative level of control with other similar Virginia sources. Based on the potential impacts to the surrounding communities, the source was also related to similar projects in other states.

BACT applicability is determined pollutant-by-pollutant, based on the corresponding permit applicability thresholds. For a new stationary source, BACT shall apply for each pollutant with an increase in the UER equal to or greater than the levels in 9VAC5-80-1105C. In addition, sources subject to the State Air Toxics Regulation that exceed the corresponding exemption threshold level for a particular air toxic, must also apply BACT to minimize air toxic emissions. For the proposed project, BACT is applicable for $PM_{2.5}$ and formaldehyde.

The applicant submitted a Best Available Control Technology review for all units not exempted under 9VAC5-80-1105B (see Section 5 of the application). Although a "top down" BACT review is not required for minor NSR permits (required for PSD permits), the applicant utilized this approach and prepared a "top down" BACT review for $PM_{2.5}$ and formaldehyde emissions. The applicant also provided a BACT review for NO_x emissions even though BACT is not applicable to NOx for this source. For this application, the primary affected emissions units are the natural gas-

[11] Air Permitting Guidance Memo No. APG-350-Ch8 – "Air Permit Guidance for Control Technology Standards", August 31, 2020.

fired combustion turbines and microturbines.

Each affected emissions unit emitting a pollutant that is subject to permitting shall apply BACT for that pollutant (9VAC5-50-260C). Under the minor NSR program, BACT is applicable for $PM_{2.5}$ and formaldehyde emissions. The applicant provided a control technology review for each pollutant. DEQ considers the control technology selected in the application to be valid (see Section 5 of the current application).

Combustion Turbines & Microturbines

$PM_{2.5}$ Emissions:
The Solar Taurus 70 combustion turbine, Solar Mars 100 combustion turbine, and the Capstone C200 microturbines will each generate $PM_{2.5}$ emissions. Main sources of particulate emissions are derivatives from the conversion of fuel sulfur to sulfates and ammonium sulfates; and from unburned hydrocarbons. $PM_{2.5}$ emissions include filterable and condensable particles with the condensable materials accounting for a significant portion of $PM_{2.5}$ emissions.[12] Particulate matter emissions include filterable and condensable forms and were derived from factors for pipeline natural gas. Condensable particles are unable to be captured with add-on filter controls.

The applicant proposes pre-combustion control technologies such as use of clean-burning, low-sulfur fuel, good combustion practices, and high efficiency inlet filters as BACT for all turbines. Natural gas fuel contains fewer sulfur particles when compared to other fossil fuels (oil, coal) making it a cleaner burning fuel. Good combustion practice ensures proper air/fuel mixing rations in order to achieve complete combustion by reducing emissions of unburned hydrocarbons that can lead to formation of $PM_{2.5}$ emissions. The use of high efficiency inlet filtration on the inlet air will minimize the entrainment of particulate matter into the turbine exhaust stream. The permit establishes a visible emissions limit not to exceed 5% from natural gas combustion turbine.

Formaldehyde:
The Solar Taurus 70 combustion turbine, Solar Mars 100 combustion turbine, Capstone C200 microturbines, and gas heater are expected to emit formaldehyde. Formaldehyde is an organic compound formed during incomplete combustion of fuel then released as a combustion byproduct. The Solar combustion turbines are the largest contributor of uncontrolled formaldehyde emissions. However, the combustion turbines (CT-01, CT-02) will employ oxidation catalyst for the destruction of CO and VOCs at 92% and 90% respectively. Since formaldehyde is an organic HAP, the use of oxidation catalyst technology is also considered BACT to control formaldehyde emissions.

The uncontrolled formaldehyde emissions from the microturbines and gas heater are much lower at 0.15 tpy and 0.00025 tpy, respectively. Based on the low emission rates and small capacity of the units, the applicant determined add-on control technologies to be technically infeasible for formaldehyde (VOC) emissions.

[12]Air Permitting Guidance Memo No. APG-110 – "Air Permit Guidance for Condensable Emissions in Particulate Pollutants", 8/28/2020.

Additional Controls Not Required by BACT (9VAC5-50-260):

Although exempt from permitting and thus BACT review is not required, the facility has voluntarily proposed the following control measures to further reduce NOx, CO, and VOC emissions that have been included in the permit:

NO_x

The applicant plans to further reduce NO_x emissions from the combustion turbines through the use of SCR control technology at 70 percent efficiency. The proposed control device is expected to achieve a NO_X exit concentration of 2.70 ppmv.

CO/VOC

An oxidation catalyst system will be employed to provide control for CO emissions at 92 percent efficiency and VOC emissions at 90 percent efficiency. The proposed control device is expected to achieve CO and VOC exit concentrations of 2.0 and 0.50 ppmv, respectively.

Fugitive Leak Components

Natural gas contains VOCs. Fugitive emissions will be monitored by daily auditory/visual/olfactory (AVO) and quarterly leak detection and repair (LDAR) techniques in accordance with Method 21 (or an optical gas-imaging camera).

Natural Gas Venting (Blowdown)

Natural gas contains VOCs. The Lambert Station has three anticipated activities or events that result in releases of natural gas: turbine start-up; turbine shutdown; and site-wide emergency shutdown (ESD) testing. The application included 52 startups and 52 shutdowns per turbine per year (208 total events for both turbines), utilizing capped ESD testing practices and one site-wide ESD testing event per year.[13] Although permitting was not triggered for VOC, DEQ reviewed the emissions from these operational practices and requested that the applicant review additional controls for emissions generated during blowdown operations. Based on the applicants review of start-up and shutdown, and other control options, the facility proposes a vent gas reduction system (VGRS) to reduce emissions of VOC due to turbine venting related to start-up and shutdown. The applicant revised the PTE emission estimates for planned depressurization events. Maintaining the estimated 208 startup and shutdowns combustion events, the facility also maintains performing 24 blowdowns (12 each turbine) after startup, shutdown, or maintenance activity but "assumes" the use of vent gas reduction (VGR). The VGRS is capable of reducing the system pressure to 30 psig prior to atmospheric depressurization. The applicant proposed capped tests using block valves to ensure negligible gas escapes during ESD testing. The use of VGRS and capped ESD testing can decrease emissions by approximately 75% for GHG alone. While not the subject of Article 6 permitting, a reduction in venting emissions also significantly reduces the amount of Methane emitted by more than 75% as CO_2e (126,349 tpy to 972 tpy).

Sulfur

A sulfur content of the natural gas of 1.1 grains per 100 scf has been established as a limitation in the permit for the natural gas quality. The limitation is used as a means of demonstrating

[13] Emission calculations assume one event per year for potential to emit.

compliance with the sulfur dioxide emission limitations established in the permit. This limit is consistent with compressor stations recently permitted by DEQ.

VI. Summary of Potential Emissions Increase

As a new stationary source, the increase in potential emissions is equal to the permitted PTE. After issuance of a permit, the PTE of the facility is summarized in the following table:

Table 3: Facility Potential to Emit

Pollutant	Past PTE (tpy)	Proposed PTE (tpy)	Change in PTE (tpy)
NO_X	0	12.37	+12.37
CO	0	17.28	+17.28
VOC	0	3.33	+3.33
SO_2	0	5.39	+5.39
$PM/PM_{10}/PM_{2.5}$	0	10.36	+10.36
HAP (total)	0	1.09	+1.09

The table above represents total facility-wide emissions. Note that the annual emission limits for pollutants whose emission rates are less than 0.5 tpy are not listed in the permit. This is the case for the annual emission rates of VOC, SO_2 and $PM_{2.5}$ for the microturbines.

Detailed emission calculations and vendor data provided by the applicant are included in the source application, Appendix B.

VII. Dispersion Modeling

A. Criteria Pollutants

A cumulative air quality analysis via dispersion modeling was conducted to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) for NO_2 (1-hour and annual averaging periods), CO (1-hour and 8-hour averaging periods), PM_{10} (24-hour averaging period) and $PM_{2.5}$ (24-hour and annual averaging periods).

For the impact of the VOC emissions, a quantitative analysis was performed in accordance with current EPA guidance.

Modeling was completed by the applicant and the protocol submitted to the Office of Air Quality Assessments for analysis. The NAAQS analysis included emissions from LCS, emissions from existing sources from Virginia, and representative ambient background concentrations of NO_2, CO, PM_{10}, and $PM_{2.5}$. The modeling analysis was approved on July 9, 2020 and demonstrated compliance with the applicable NAAQS. The table below summarizes the criteria pollutant modeling analysis results:

Pollutant (averaging period)	Total Modeled Concentration ($\mu g/m^3$)	Ambient Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2 (1-hr)	178.8	---(1)	178.8	188
NO_2 (annual)	21.8	13.2	35.0	100
CO (1-hr)	2,151	1,955	4,106	40,000
CO (8-hr)	1,106	1,495	2,601	10,000
$PM_{2.5}$ (24-hr)	5.8	17	23.0(2)	35
$PM_{2.5}$ (annual)	1.0	6.9	7.9(2)	12
PM_{10} (24-hr)	9.1	22	31.1	150

(1) Season and hour of day varying.
(2) Total concentration includes the contribution from secondary $PM_{2.5}$ formation.

B. State Air Toxic Pollutants

Modeling is also required if potential State Air Toxic pollutant emissions (after issuance of the permit) exceed the exemption thresholds included in 9VAC5-60-300 C. Based on toxic pollutant emission calculations, after controls formaldehyde emissions from the proposed facility exceeds exemption thresholds and require modeling. Due to Virginia's recent permit activities for compressor stations, DEQ requested that the applicant include a modeling analysis for formaldehyde and hexane in order to determine the Predicted Ambient Air Concentration (PAAC) and to compare those values against their respective Significant Ambient Air Concentration (SAAC).

Modeling was completed by the applicant and protocol submitted to the Office of Air Quality Assessments for review. The modeling analysis was approved on July 9, 2020 and demonstrates compliance with the applicable SAAC. The table below summarizes the toxic pollutant modeling analysis results:

Air Toxic Pollutant (averaging period)	**Scenario**	**Modeled Concentration (PAAC) ($\mu g/m^3$)**	**SAAC ($\mu g/m^3$)**
Formaldehyde (1-hour)	50% Load	2.8	62.5
Formaldehyde (1-hour)	75% Load	2.8	62.5
Formaldehyde (1-hour)	100% Load	2.8	62.5

Air Toxic Pollutant (averaging period)	Scenario	Modeled Concentration (PAAC) ($\mu g/m^3$)	SAAC ($\mu g/m^3$)
Formaldehyde (1-hour)	Startup (blended with 50% load)	11.2	62.5
Formaldehyde (1-hour)	Shutdown (blended with 50% load)	8.6	62.5
Formaldehyde (annual)	50% Load	0.050	2.4
Formaldehyde (annual)	75% Load	0.050	2.4
Formaldehyde (annual)	100% Load	0.050	2.4
Hexane (1-hour)	Unit Blowdown (with Pigging)	1,298	8,800
Hexane (1-hour)	Emergency Shutdown [1] (with Pigging)	5,435	8,800
Hexane (annual)	Unit Blowdown (with Pigging)	0.276	352
Hexane (annual)	Emergency Shutdown (with Pigging)	0.228	352

[1]The emergency shutdown scenario reflects an actual emergency scenario. These testing events are capped to limit the amount of gas released into the atmosphere. Even though emergency conditions are not typically required to be modeled, these data are provided as part of the analysis for informational purposes only.

C. Other Modeling Considerations:

Ozone

An assessment to estimate the impact on ozone from the proposed facility's NO_X and VOC emissions was conducted. The calculated impact was approximately 0.05 parts per billion (ppb) of ozone. The monitored ozone design value for the area is approximately 59 ppb for the period 2017 through 2019. This results in a total design value equal to 59.05 ppb which is well below the 8-hour ozone NAAQS of 70 ppb.

A copy of the Air Quality Analysis Memorandum is provided as Attachment 2.

D. Environmental Justice Considerations

Environmental Justice is defined by the Virginia Environmental Justice Act (VEJA) as "the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, faith, disability, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies." Va. Code §2.2-234. Recent changes to the State Air Pollution Control Law also expressly make it a purpose of DEQ to "further environmental justice" in permitting actions. Va. Code § 10.1-1183. Similarly, environmental Justice is defined by the EPA as the fair treatment and meaningful involvement of all people regardless of

race, color, faith, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA defines fair treatment to mean no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. Executive Order 29 (issued by Governor Northam on January 22, 2019) uses the same definition and established the Virginia Council on Environmental Justice (VCEJ).

DEQ requested that the applicant conduct an environmental justice review. The applicant submitted a supplement to the application dated 9/17/2020 with this review. To help identify potential impacts on minority and low-income populations, the applicant used both desk-top information, such as census data obtained from the Environmental Protection Agency's environmental justice screening and mapping tool, "EJSCREEN" and field studies to confirm the results. DEQ also conducted its own review, and the results of that review are discussed in the response to comments document.

The review describes the applicant's community engagement efforts to enhance meaningful involvement by environmental justice community members. Further, the review provides an evaluation of impacts from the proposed Station, and concludes that no environmental justice community bears a disproportionate share of any such impacts. Impacts analyzed include: air emissions and health impacts, cumulative exposures from other sources of pollution, cultural and historic resources, noise, dust, traffic and emergency services, safety, and other perceived impacts based on comments from community members during outreach.

DEQ has taken several actions in pursuit of the environmental justice principles of fair treatment and meaningful involvement.

Land & Heritage Consulting Study

The applicant also contracted with a third party consulting agency to supplement and expand upon its environmental justice review.

Meaningful Involvement

Using broader definitions than those in VEJA, Land & Heritage Consulting identified multiple communities throughout Pittsylvania County who meet the criteria for designation as Environmental Justice communities were identified. The study indicated limitations such as travel, pandemic confines and community protests (e.g., social issues on a national level) having an impact on the time spent "ground-truthing" the study. The review indicated having the following goals: (1) identify potential environmental justice communities and ways in which they anticipate impact; and (2) identify potential actions community members believe could be taken to ensure fair treatment and meaningful involvement in the impact and outcome of the proposed Station".[14] The community impact assessment lasted from May 2020 through August of 2020.

The review involved a desktop geospatial analysis that spanned a 10 mile radius, followed by an

[14] Land & Heritage Consulting, LLC, "Community Impact Assessment of Lambert Compressor Station", Appendix A, MVP supplemental application, September 2020.

outreach/interview approach to increase available participants. The report covered topics such as: geographical context, methods of parameter and scope (census tracts, analysis criteria), cultural community identification, techniques and approaches to spatial data analysis, community interview collection, results, conclusion and recommendations.

Disproportionate Impact
The study states that, based on expanded environmental justice definitions, all census tracts within a 10-mile radius were considered environmental justice communities. It suggests that planning and siting activities require special consideration towards the needs and concerns of the communities in these areas. Most of the respondents were not familiar with the proposed Station, but those who were expressed comfort with the proposed location, citing its proximity to another existing compressor station and appreciated the applicant's use of existing corridors and already impacted landscapes. Other respondents focused on issues such as discovery of sensitive artifacts or remains, landscape issues, and expressed discomfort with the proposed pipeline, having concerns about the risk of further degradation of community health, as well as ecosystem and water quality associated with the project.

Respondents expressed some level of discomfort, distrust or skepticism about the parent company, MVP. The distrust was lower among both Indigenous and non-Indigenous respondents who currently worked in fields related to construction, engineering, or transportation. In an attempt to reach all communities, at the time of this review, a response was not received from an African-American community of "Freedmen" descendants dispersed throughout Chatham and the broader census tracts approximately 14 miles south of the proposed Station.

The report summarized replies according to Indigenous and non-Indigenous community respondents from the 10-mile radius. The areas of concern for non-Indigenous respondents were categorized as: 1) Critical Service Provision, 2) Safety & Policing, and 3) Recreation, Landscape and Way of Life Preservation. The areas of concern from Indigenous respondents were classified as: 1) Landscape, Artifacts, and Sense of Place, 2) Identity, Livelihood & Sense of Community, 3) Language & Governance, and 4) Spirituality, Ceremony & Traditional Knowledge. For more details regarding the responses, refer to Appendix A of the supplement to the application received 9/16/2020.

VIII. Compliance Demonstration

Turbines (CT-01, CT-02)
For proper operation of the SCR system, the permit requires monitoring of the 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.
The applicant must develop a monitoring plan for the turbine monitoring parameters. The turbines must also be tested bi-annually for CO, PM_{10}, $PM_{2.5}$ and VOC. The time between bi-annual tests must not exceed 26 calendar months. The applicant is required to validate the monitoring ranges during each performance test. Continuous emission monitoring system (CEMS) will be used to demonstrate NO_X emissions. Performance evaluations of the CEMS shall be conducted in

accordance with 40 CFR Part 60, Appendix B, and take place during the performance test or within 30 days thereafter. The inlet filters will be maintained in accordance with the manufacturer's recommendations.

The VGRS allows for 'pressurized hold' by maintaining a seal gas pressure sufficiently higher than the compressor case pressure. A test to determine the appropriate range for each turbine is required using Method 21 or an optical gas imaging camera to ensure no leakage. Records of the daily AVO and quarterly LDAR surveys are also required, as well as corrective actions taken.

Microturbines (MT-01 – MT-05)
The applicant must develop a monitoring plan for the microturbines' monitoring parameters. The microturbines are relatively small units, each having a heat input rating of 2.28 MMBtu/hr. The highest pollutant emission rate is NO_x a combined total of 0.4 tpy for all five units. Based on their small size and low emissions, an initial performance test is required to establish estimated emission limits. Continuing compliance will be demonstrated through visible emission observation, evaluations and recordkeeping

Other Records
Records of fuel combusted, venting events, and scheduled and unscheduled maintenance must be maintained for each unit. Records must also be maintained for exempt equipment in accordance with 9VAC5-80-1105A.4.

IX. Title V Review – 9VAC5 Chapter 80 Part II Article 1

After issuance of this permit, the facility does not have a PTE for any pollutant greater than the respective Title V major source threshold. The facility is not in a category required to obtain a Title V permit regardless of emission rate. Title V permitting does not apply.

X. Public Participation and Notifications

9VAC5-80-1170D states that prior to a decision of the board, minor NSR permit applications that have the potential for public interest concerning air quality, as determined by the board, shall be subject to a public comment period of at least 30 days. At the end of the public comment period, a public hearing shall be held according to 9VAC5-80-1170E.

§10.1-1307.01 B of the Air Pollution Control Board law requires that before granting a permit for a new fossil fuel fired compressor station facility used to transport natural gas if the Board finds that there is a locality particularly affected by such a permit.[15] Pittsylvania County has been determined to be a locality particularly affected by the proposed facility because the locality bears an identified disproportionate material air quality impact that would not be experienced by other localities. For purposes of applicability of this regulation, DEQ is conservatively assuming that an increase in emissions greater than 1.0 $\mu g/m^3$ is considered an "identified disproportionate material air quality impact". The dispersion modeling results were compared to the NAAQS and SAAC and those comparisons demonstrate that the air quality impact of all pollutants is lower than the NAAQS and SAAC (see Section VII and Attachment 2).

[15]Code of Virginia: "locality particularly affected" means any locality that bears any identified disproportionate material air quality impact that would not be experienced by other localities (§ 10.1-1307.01).

The following steps will be taken regarding soliciting public comment and participation for the proposed facility:

- DEQ shall publish a public notice in the *Chatham Star-Tribune* to notify the public of an Informational Briefing on this proposed permit, at least 15 days prior to the date of the briefing. The public notice was published on December 16, 2020.
- DEQ shall hold an Informational Briefing on January 7, 2021 to share information about the proposed permit.
- DEQ shall publish a public notice in the *Chatham Star-Tribune* to notify the public of a Public Hearing to be held at least 30 days after the publication date of the public notice. In addition, the notice will include a notification of a public comment period to start on the date of the publication and ending no earlier than 30 days after the Public Hearing. The public notice was published on January 8, 2021, the Public Hearing was held on February 8, 2021 and the public comment period ended on April 9, 2021.
- DEQ shall post such copies of these notices on the agency's website and social media accounts and will send copies to local civic groups, churches, schools, and libraries including the following: tribal communities, medical centers, chief elected officials of Chatham and Pittsylvania County government, chief administrative officer of Pittsylvania County, Pittsylvania County administrators, local planning commission, regional planning district commission, and Pittsylvania County district representatives from the Virginia General Assembly.
- The applicant shall publish a notice in the *Chatham Star-Tribune* at least 60 days prior to the close of any public comment period. Copies of the notice shall also be sent to: the chief elected official of, chief administrative officer of, and planning district commission for Pittsylvania County; every public library and public school located within five miles of the Station; and the owner of each parcel of real property that is depicted as adjacent to the facility on the current real estate tax assessment maps of the locality. The public notice was published on January 6, 2021.

Public comments will be reviewed and responded to by DEQ. A copy of those comments and responses will be available separate from this document.

XI. Other Considerations

None.

XII. Recommendations

Approval of the draft permit is recommended.

Attachments

- Attachment 1 – Frequently Used Permitting Terms
- Attachment 2 – Air Quality Modeling Memorandum
- Attachment 3 – DEQ EJ SCREEN Report

ATTACHMENTS

Frequently Used Terms

@15% O_2 – A notation indicating that the concentration is mathematically corrected from the actual stack conditions to a comparable set of conditions. This prevents a source from adding additional ambient air just prior to the testing instrumentation to dilute the concentration of the pollutant being measured. This is not an issue with a mass emission rate since dilution does not change the mass of the pollutant emitted. The pound per million (ppm) limitations are corrected to 15% O_2.

Blowdown – A venting event where piping at the facility must be emptied of natural gas; a site-wide blowdown is when all piping at the facility must be emptied.

Catalyst – A substance that changes the reaction speed but does not participate in the reaction.

CO – Carbon monoxide, a pollutant with a NAAQS.

Fugitive – Describes a type of emissions that occur but cannot be reasonably collected.

CO_2e – "Carbon dioxide equivalent", a term to describe different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact.

GHG – "Greenhouse gas", gases consisting of carbon dioxide, methane, nitrous oxide and fluorinated compounds that trap heat in the atmosphere. The proposed Titan 130 combustion turbines will emit CO_2, CH_4, and N_2O.

ISO conditions – Properties of a gas change based on the gas temperature and pressure exerted on the gas. In order to have a meaningful discussion regarding any gases, these variables must be defined. While several methods exist to define these variables, the International Organization for Standardization (ISO) defines the conditions as 59°F and 14.7 pounds per square inch (psi).

LDAR – Leak Detection and Repair – usually refers to a program a source uses to monitor various pieces of equipment at a facility that may be prone to leaking and fix leaks as detected

MACT – Maximum Achievable Control Technology; federal regulations for certain types of equipment; used in this analysis to refer to such standards promulgated in 40 CFR Part 63, which are technology based.

MMBtu – Million British thermal units – a measure of energy

NAAQS – National Ambient Air Quality Standard; a federal standard for the maximum concentration of a certain air pollutant in the ambient air in the country that is protective of human health. CO, O_3, NO_2, PM_{10}, $PM_{2.5}$, SO_2, and lead are the pollutants with NAAQS.

NESHAPS – National Emission Standards for Hazardous Air Pollutants; federal regulations for certain types of equipment; used in this analysis to refer to such standards promulgated

in 40 CFR Part 61, which are risk based.

NO_X – Nitrogen oxides or oxides of nitrogen – a surrogate for the amount of NO_2 (a pollutant with a NAAQS) being emitted; a pollutant that forms ozone when the atmosphere has favorable conditions (hot and dry with enough VOC).

NSPS – New Source Performance Standard; federal regulations for certain types of equipment.

Open flare – A stack-like device with a continuous flame at the tip, such that when a flammable gas flows, the 'pilot flame' ignites the gas prior to exiting the flare stack; also described as a candlestick flare for its similarity in appearance to a large candle.

Pigging – The method of removing liquids from the piping; liquids can be generated due to the high pressure of the gas causing some components to condense in the piping. No pigging operations are performed at this site.

PM – Particulate matter of a certain size that only includes the portion that can be filtered when emitted.

PM_{10} and $PM_{2.5}$ – Particulate matter of a certain size that includes both the portion that can be filtered when emitted and the portion that is a gas when emitted and later condenses; both pollutants have a NAAQS.

pph, lb/hr – pound per hour – a short-term mass emission rate

ppm – parts per million – A concentration that can be converted to a mass emission rate.

ppmvd – parts per million, volumetric dry.

PSD – Prevention of Significant Deterioration; a pre-construction permitting program that applies to large sources.

PTE – potential to emit – the maximum ability of a source to emit pollutants considering permit limitations

Stoichiometric – Chemical reactions rely on the correct amount of each chemical. The ideal amount of each chemical is the 'stoichiometric' amount or ratio.

TPY, tpy, ton/yr – ton per year – a long-term mass emission rate

Vent Gas Reduction System (VGRS) – A system, including an electrically-driven compressor, which reduces the amount of natural gas released to the atmosphere during combustion turbine shutdowns by maintain sufficient pressure to ensure that the compressor seal remains intact during combustion turbine shutdowns.

VOC – Volatile Organic Compounds – A group of chemicals that form ozone when the atmosphere has favorable conditions (hot and dry with enough NO_X).

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Air Quality Assessments

1111 East Main Street, Richmond, VA 23219
22nd Floor
804/698-4000

To: Paul Jenkins, Air Permit Manager (BRRO)

From: Office of Air Quality Assessments (AQA)

Date: July 9, 2020

Subject: Air Quality Analysis – MVP Southgate Lambert Compressor Station

I. Project Background

Mountain Valley Pipeline, LLC (MVP) is proposing to construct and operate the MVP Southgate Lambert Compressor Station (LCS) in Pittsylvania County, Virginia, near the town of Chatham. The proposed facility will consist of two natural gas-driven turbines, one Solar Taurus 70 compressor turbine (11,146 horsepower (hp)) and one Solar Mars 100 compressor turbine (16,610 hp), five Capstone microturbines rated at 200 kilowatts each, one 0.77 MMBtu/hr natural gas-fired heater, two 10,000 gallon produced fluid tanks, gas filter/separators, gas coolers, inlet air filters, exhaust silencers, and blowdown silencers.

The proposed LCS meets the definition of minor source under 9 VAC 5 Chapter 80, Article 6 (Permits for New and Modified Stationary Sources) of the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution. The DEQ required an air quality analysis in order to assess the potential impacts to ambient air quality. Modeling was conducted for nitrogen dioxide (NO_2), 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 (PM_{10}).

Toxics modeling was also conducted for hourly and annual formaldehyde and hexane emissions to demonstrate compliance with their respective Significant Ambient Air Concentrations (SAAC) as defined in 9 VAC 5 Chapter 60, Article 5 (Emission Standards for Toxic Pollutants from New and Modified Sources) of the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution (9VAC5-60-300 et al).

II. Modeling Methodology

The air quality modeling analysis 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 19191). AERMOD is the preferred EPA-approved regulatory model for near-field applications.

Additional details on the modeling methodology are available in the applicant's June 2020 air quality dispersion modeling report.

III. Modeling Results

A. NAAQS Analysis

A cumulative modeling analysis was conducted to assess compliance with the National Ambient Air Quality Standards (NAAQS) for the pollutants and averaging periods listed in Table 1. The NAAQS analysis included emissions from the proposed facility, emissions from existing sources from Virginia, and representative ambient background concentrations. The ambient background concentrations in Table 1 have been updated to the most recent design values (2017-2019). The results of the NAAQS analysis are presented in Table 1 and demonstrate modeled compliance with the applicable NAAQS.

Table 1
NAAQS Modeling - Cumulative Impact Results

Pollutant	Averaging Period	Total Modeled Concentration ($\mu g/m^3$)	Ambient Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hour	178.8	--(1)	178.8	188
NO_2	Annual	21.8	13.2	35.0	100
CO	1-hour	2,151	1,955	4,106	40,000
CO	8-hour	1,106	1,495	2,601	10,000
$PM_{2.5}$	24-hour	5.8	17	23.0(2)	35
$PM_{2.5}$	Annual	1.0	6.9	7.9(2)	12
PM_{10}	24-hour	9.1	22	31.1	150

(1) Season and hour of day varying.
(2) Total concentration includes the contribution from secondary $PM_{2.5}$ formation.

A source contribution analysis of the maximum 1-hour NO2 total concentration of 178.8 µg/m3 from the NAAQS analysis is provided in Table 2. The table clearly illustrates that the contribution from the proposed LCS to this concentration is relatively small when compared to the adjacent Transco Compressor Station 165. DEQ has required that Transco Station 165 install and operate an NO2 ambient

monitor as close as possible to the maximum modeled impact in order to ensure continuing compliance with the 1-hour NO2 NAAQS. This requirement is detailed in Condition 49 of the NSR permit issued to Transco Station 165 on January 28, 2020.

Table 2
Source Contribution Analysis - Maximum 1-Hour NO_2 Concentration

Contributing Source	Concentration ($\mu g/m^3$)
Transco Compressor Station 165	116.85
Lambert Compressor Station	1.04
Other Modeling Inventory Sources	0.04
Background Air Quality	60.86
Total Concentration	**178.8**

Additionally, Table 3 presents the maximum modeled design concentrations from the proposed LCS sources only at any location within the modeling domain. As shown in the table, the LCS has a relatively small overall impact relative to the NAAQS and the total modeled concentrations presented in Table 1.

Table 3
NAAQS Modeling – Lambert Compressor Station Sources Only Impact Results

Pollutant	Averaging Period	Modeled Design Concentration - LCS Sources Only(1) ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS
NO_2	1-hour	17.48	188	9.3
NO_2	Annual	1.36	100	1.4
CO	1-hour	156.37	40,000	0.4
CO	8-hour	47.74	10,000	0.5
$PM_{2.5}$	24-hour	0.79(2)	35	2.3
$PM_{2.5}$	Annual	0.14(2)	12	1.2
PM_{10}	24-hour	1.27	150	0.8

(1) Design concentrations are based on model output in the form of the NAAQS from the LCS sources only.
(2) Includes the contribution from secondary $PM_{2.5}$ formation from the LCS sources only.

B. Toxics Analysis

The proposed facility is subject to the state toxics regulations at 9VAC5-60-300 et al. An analysis was conducted in accordance with the regulations and the predicted concentrations

for each modeled toxic pollutant were below their respective SAAC. Table 4 summarizes the toxic pollutant modeling analysis results.

Table 4
Toxics Analysis Maximum Predicted Concentrations

Toxic Pollutant	Averaging Period	Scenario	Modeled Concentration ($\mu g/m^3$)	SAAC ($\mu g/m^3$)
Formaldehyde	1-hour	50% Load	2.8	62.5
Formaldehyde	1-hour	75% Load	2.8	62.5
Formaldehyde	1-hour	100% Load	2.8	62.5
Formaldehyde	1-hour	Startup (blended with 50% load)	11.2	62.5
Formaldehyde	1-hour	Shutdown (blended with 50% load)	8.6	62.5
Formaldehyde	Annual	50% Load	0.050	2.4
Formaldehyde	Annual	75% Load	0.050	2.4
Formaldehyde	Annual	100% Load	0.050	2.4
Hexane	1-hour	Unit Blowdown (with Pigging)	1,298	8,800
Hexane	1-hour	Emergency Shutdown[1] (with Pigging)	5,435	8,800
Hexane	Annual	Unit Blowdown (with Pigging)	0.276	352
Hexane	Annual	Emergency Shutdown[1] (with Pigging)	0.228	352

[1] The emergency shutdown scenario reflects an actual emergency scenario. These testing events are capped to limit the amount of gas released into the atmosphere. Even though emergency conditions are not typically required to be modeled, these data are provided as part of the analysis for informational purposes only.

C. Other Modeling Considerations

Ozone

An assessment to estimate the impact on ozone from the proposed facility's NO_X and VOC emissions was conducted. The conservatively calculated impact was approximately 0.05 parts per billion (ppb) of ozone. The monitored ozone design value for the area is approximately 59 ppb for the period 2017 through 2019. This results in a total design value equal to 59.05 ppb which is well below the 8-hour ozone NAAQS of 70 ppb.

EJSCREEN Report (Version 2020)

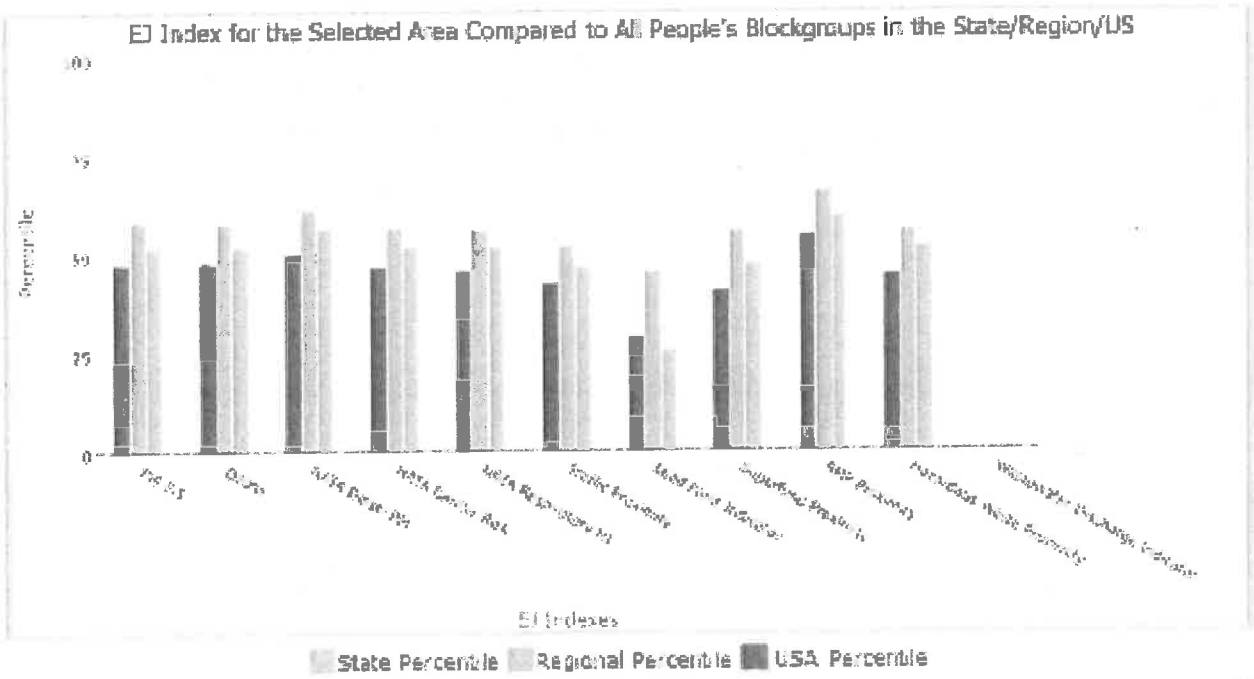
1 mile Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 177

Input Area (sq. miles): 3.14

Lambert Compressor Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	52	59	48
EJ Index for Ozone	52	58	48
EJ Index for NATA* Diesel PM	57	62	50
EJ Index for NATA* Air Toxics Cancer Risk	52	57	47
EJ Index for NATA* Respiratory Hazard Index	52	56	46
EJ Index for Traffic Proximity and Volume	47	52	43
EJ Index for Lead Paint Indicator	26	46	29
EJ Index for Superfund Proximity	48	56	41
EJ Index for RMP Proximity	60	66	55
EJ Index for Hazardous Waste Proximity	52	56	45
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the value for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretation and application of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 177

Input Area (sq. miles): 3.14

Lambert Compressor Station

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 36.826763,-79.341625, VIRGINIA, EPA Region 3

Approximate Population: 177

Input Area (sq. miles): 3.14

Lambert Compressor Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	7.71	7.87	47	8.63	18	8.55	24
Ozone (ppb)	41.9	42.4	34	43.2	24	42.9	42
NATA* Diesel PM (µg/m³)	0.174	0.425	11	0.477	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	30	31	43	31	<50th	32	<50th
NATA* Respiratory Hazard Index	0.39	0.41	41	0.4	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	53	570	30	650	25	750	25
Lead Paint Indicator (% Pre-1960 Housing)	0.32	0.21	77	0.36	55	0.28	64
Superfund Proximity (site count/km distance)	0.055	0.11	44	0.15	34	0.13	45
RMP Proximity (facility count/km distance)	0.041	0.38	2	0.62	2	0.74	3
Hazardous Waste Proximity (facility count/km distance)	0.27	1.6	25	2	28	5	30
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	3.1	N/A	34	N/A	54	N/A
Demographic Indicators							
Demographic Index	27%	32%	48	30%	56	36%	45
People of Color Population	35%	38%	51	33%	62	39%	54
Low Income Population	19%	25%	44	27%	40	33%	32
Linguistically Isolated Population	3%	3%	72	3%	75	4%	63
Population With Less Than High School Education	17%	11%	78	10%	81	13%	73
Population Under 5 years of age	3%	6%	17	6%	18	6%	17
Population over 64 years of age	31%	15%	95	16%	95	15%	95

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to the screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

June 11, 2021

EJSCREEN Report (Version 2020)

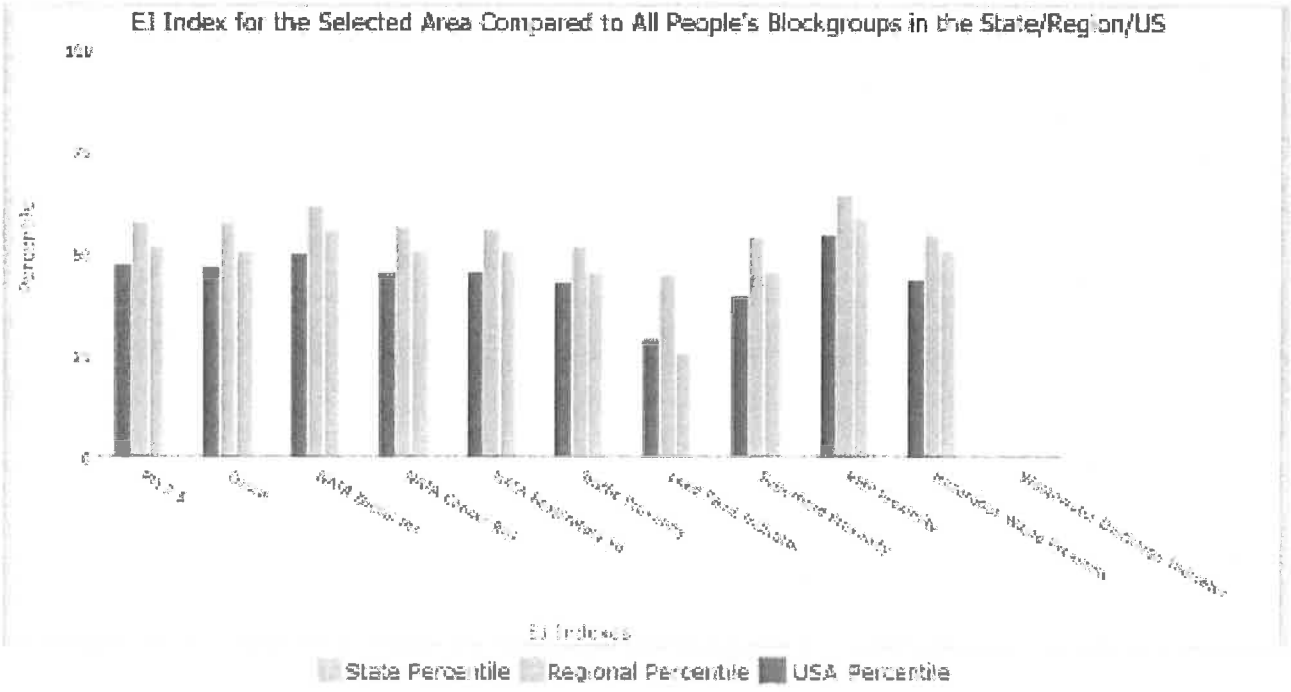
2 miles Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 411

Input Area (sq. miles): 12.56

Lambert Compressor Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	52	58	48
EJ Index for Ozone	51	58	47
EJ Index for NATA* Diesel PM	56	62	50
EJ Index for NATA* Air Toxics Cancer Risk	51	57	46
EJ Index for NATA* Respiratory Hazard Index	51	56	46
EJ Index for Traffic Proximity and Volume	46	52	43
EJ Index for Lead Paint Indicator	26	45	29
EJ Index for Superfund Proximity	46	54	40
EJ Index for RMP Proximity	59	65	55
EJ Index for Hazardous Waste Proximity	51	55	44
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

2 miles Ring Centered at 36.826783,-79.341625, VIRGINIA, EPA Region 3

Approximate Population: 411

Input Area (sq. miles): 12.56

Lambert Compressor Station

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

2 miles Ring Centered at 36.826763,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 411

Input Area (sq. miles): 12.56

Lambert Compressor Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	7.72	7.87	47	8.63	18	8.55	25
Ozone (ppb)	41.9	42.4	34	43.2	25	42.9	42
NATA* Diesel PM (µg/m³)	0.173	0.425	11	0.477	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	30	31	43	31	<50th	32	<50th
NATA* Respiratory Hazard Index	0.39	0.41	40	0.4	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	53	570	30	650	25	750	25
Lead Paint Indicator (% Pre-1960 Housing)	0.32	0.21	76	0.36	55	0.28	64
Superfund Proximity (site count/km distance)	0.057	0.11	46	0.15	35	0.13	47
RMP Proximity (facility count/km distance)	0.042	0.36	3	0.62	2	0.74	3
Hazardous Waste Proximity (facility count/km distance)	0.28	1.6	26	2	28	5	30
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	3.1	N/A	34	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	27%	32%	47	30%	55	36%	44
People of Color Population	34%	38%	50	33%	61	39%	53
Low Income Population	19%	25%	45	27%	41	33%	33
Linguistically Isolated Population	3%	3%	72	3%	74	4%	62
Population With Less Than High School Education	17%	11%	78	10%	81	13%	73
Population Under 5 years of age	3%	6%	18	6%	19	6%	18
Population over 64 years of age	31%	15%	95	16%	94	15%	94

* The National Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

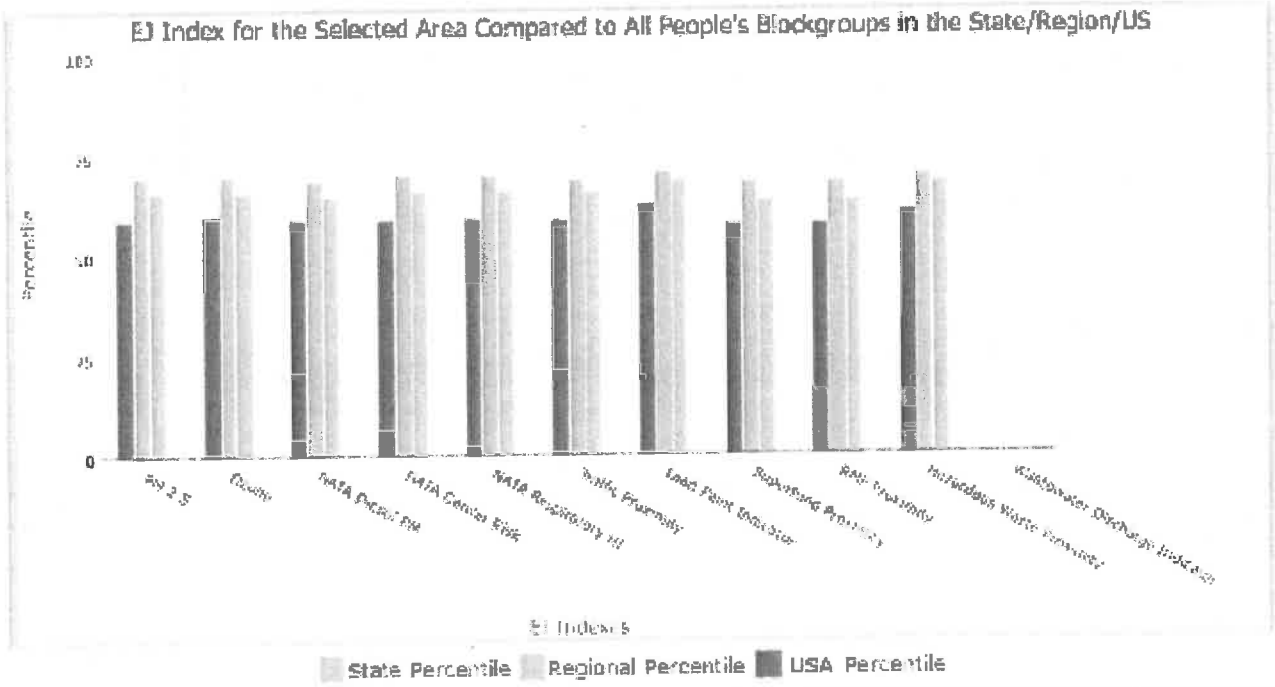
5 miles Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 4,965

Input Area (sq. miles): 78.53

Lambert Compressor Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	66	70	59
EJ Index for Ozone	66	70	60
EJ Index for NATA* Diesel PM	65	69	59
EJ Index for NATA* Air Toxics Cancer Risk	65	70	59
EJ Index for NATA* Respiratory Hazard Index	66	70	59
EJ Index for Traffic Proximity and Volume	66	69	59
EJ Index for Lead Paint Indicator	69	71	63
EJ Index for Superfund Proximity	64	68	58
EJ Index for RMP Proximity	64	68	58
EJ Index for Hazardous Waste Proximity	68	70	61
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

5 miles Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 4,965

Input Area (sq. miles): 78.53

Lambert Compressor Station

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

EJSCREEN Report (Version 2020)

5 miles Ring Centered at 36.826783,-79.341626, VIRGINIA, EPA Region 3

Approximate Population: 4,965

Input Area (sq. miles): 78.53

Lambert Compressor Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	7.73	7.87	48	8.63	18	8.56	25
Ozone (ppb)	41.9	42.4	34	43.2	25	42.9	42
NATA* Diesel PM (µg/m³)	0.169	0.425	10	0.477	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	30	31	43	31	<50th	32	<50th
NATA* Respiratory Hazard Index	0.39	0.41	40	0.4	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	55	570	30	650	25	750	26
Lead Paint Indicator (% Pre-1960 Housing)	0.42	0.21	84	0.36	64	0.28	72
Superfund Proximity (site count/km distance)	0.059	0.11	47	0.15	37	0.13	48
RMP Proximity (facility count/km distance)	0.043	0.38	3	0.62	2	0.74	3
Hazardous Waste Proximity (facility count/km distance)	0.33	1.6	28	2	31	5	32
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	3.1	N/A	34	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	35%	32%	63	30%	68	36%	57
People of Color Population	35%	38%	52	33%	63	39%	54
Low Income Population	33%	25%	67	27%	66	33%	57
Linguistically Isolated Population	1%	3%	60	3%	63	4%	52
Population With Less Than High School Education	18%	11%	80	10%	82	13%	75
Population Under 5 years of age	4%	6%	25	6%	27	6%	26
Population over 64 years of age	21%	15%	79	16%	76	15%	79

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

June 11, 2021

ATTACHMENT D - AIR QUALITY ANALYSES REVIEW

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Air Quality Assessments

1111 East Main Street, Richmond, VA 23219
22nd Floor

804/698-4000

To: Paul Jenkins, Air Permit Manager (BRRO)

From: Office of Air Quality Assessments (AQA)

Date: July 9, 2020

Subject: Air Quality Analysis – MVP Southgate Lambert Compressor Station

I. Project Background

Mountain Valley Pipeline, LLC (MVP) is proposing to construct and operate the MVP Southgate Lambert Compressor Station (LCS) in Pittsylvania County, Virginia, near the town of Chatham. The proposed facility will consist of two natural gas-driven turbines, one Solar Taurus 70 compressor turbine (11,146 horsepower (hp)) and one Solar Mars 100 compressor turbine (16,610 hp), five Capstone microturbines rated at 200 kilowatts each, one 0.77 MMBtu/hr natural gas-fired heater, two 10,000 gallon produced fluid tanks, gas filter/separators, gas coolers, inlet air filters, exhaust silencers, and blowdown silencers.

The proposed LCS meets the definition of minor source under 9 VAC 5 Chapter 80, Article 6 (Permits for New and Modified Stationary Sources) of the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution. The DEQ required an air quality analysis in order to assess the potential impacts to ambient air quality. Modeling was conducted for nitrogen dioxide (NO_2), 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 (PM-10).

Toxics modeling was also conducted for hourly and annual formaldehyde and hexane emissions to demonstrate compliance with their respective Significant Ambient Air Concentrations (SAAC) as defined in 9 VAC 5 Chapter 60, Article 5 (Emission Standards for Toxic Pollutants from New and Modified Sources) of the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution (9 VAC 5-60-300 et al).

II. Modeling Methodology

The air quality modeling analysis 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 19191). AERMOD is the preferred EPA-approved regulatory model for near-field applications.

Additional details on the modeling methodology are available in the applicant's June 2020 air quality dispersion modeling report.

III. Modeling Results

A. NAAQS Analysis

A cumulative modeling analysis was conducted to assess compliance with the National Ambient Air Quality Standards (NAAQS) for the pollutants and averaging periods listed in Table 1. The NAAQS analysis included emissions from the proposed facility, emissions from existing sources from Virginia, and representative ambient background concentrations. The ambient background concentrations in Table 1 have been updated to the most recent design values (2017-2019). The results of the NAAQS analysis are presented in Table 1 and demonstrate modeled compliance with the applicable NAAQS.

Table 1
NAAQS Modeling - Cumulative Impact Results

Pollutant	Averaging Period	Total Modeled Concentration ($\mu g/m^3$)	Ambient Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hour	178.8	--(1)	178.8	188
NO_2	Annual	21.8	13.2	35.0	100
CO	1-hour	2,151	1,955	4,106	40,000
CO	8-hour	1,106	1,495	2,601	10,000
PM-2.5	24-hour	5.8	17	23.0(2)	35
PM-2.5	Annual	1.0	6.9	7.9(2)	12
PM-10	24-hour	9.1	22	31.1	150

(1) Season and hour of day varying.

(2) Total concentration includes the contribution from secondary PM-2.5 formation.

A source contribution analysis of the maximum 1-hour NO_2 total concentration of 178.8 $\mu g/m^3$ from the NAAQS analysis is provided in Table 2. The table clearly illustrates that the contribution from the proposed LCS to this concentration is relatively small when compared to the adjacent Transco Compressor Station 165. DEQ has required that Transco Station

165 install and operate an NO_2 ambient monitor as close as possible to the maximum modeled impact in order to ensure continuing compliance with the 1-hour NO_2 NAAQS. This requirement is detailed in Condition 49 of the NSR permit issued to Transco Station 165 on January 28, 2020.

Table 2
Source Contribution Analysis - Maximum 1-Hour NO_2 Concentration

Contributing Source	Concentration ($\mu g/m^3$)
Transco Compressor Station 165	116.85
Lambert Compressor Station	1.04
Other Modeling Inventory Sources	0.04
Background Air Quality	60.86
Total Concentration	**178.8**

Additionally, Table 3 presents the maximum modeled design concentrations from the proposed LCS sources only at any location within the modeling domain. As shown in the table, the LCS has a relatively small overall impact relative to the NAAQS and the total modeled concentrations presented in Table 1.

Table 3
NAAQS Modeling – Lambert Compressor Station Sources Only Impact Results

Pollutant	Averaging Period	Modeled Design Concentration - LCS Sources Only[1] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS
NO_2	1-hour	17.48	188	9.3
NO_2	Annual	1.36	100	1.4
CO	1-hour	156.37	40,000	0.4
CO	8-hour	47.74	10,000	0.5
PM-2.5	24-hour	0.79[2]	35	2.3
PM-2.5	Annual	0.14[2]	12	1.2
PM-10	24-hour	1.27	150	0.8

(1) Design concentrations are based on model output in the form of the NAAQS from the LCS sources only.

(2) Includes the contribution from secondary PM-2.5 formation from the LCS sources only.

B. Toxics Analysis

The proposed facility is subject to the state toxics regulations at 9 VAC 5-60-300 et al. An analysis was conducted in accordance with the regulations and the predicted concentrations

for each modeled toxic pollutant were below their respective SAAC. Table 4 summarizes the toxic pollutant modeling analysis results.

Table 4
Toxics Analysis Maximum Predicted Concentrations

Toxic Pollutant	Averaging Period	Scenario	Modeled Concentration ($\mu g/m^3$)	SAAC ($\mu g/m^3$)
Formaldehyde	1-hour	50% Load	2.8	62.5
Formaldehyde	1-hour	75% Load	2.8	62.5
Formaldehyde	1-hour	100% Load	2.8	62.5
Formaldehyde	1-hour	Startup (blended with 50% load)	11.2	62.5
Formaldehyde	1-hour	Shutdown (blended with 50% load)	8.6	62.5
Formaldehyde	Annual	50% Load	0.050	2.4
Formaldehyde	Annual	75% Load	0.050	2.4
Formaldehyde	Annual	100% Load	0.050	2.4
Hexane	1-hour	Unit Blowdown (with Pigging)	1,298	8,800
Hexane	1-hour	Emergency Shutdown[1] (with Pigging)	5,435	8,800
Hexane	Annual	Unit Blowdown (with Pigging)	0.276	352
Hexane	Annual	Emergency Shutdown[1] (with Pigging)	0.228	352

(1) The emergency shutdown scenario reflects an actual emergency scenario. These testing events are capped to limit the amount of gas released into the atmosphere. Even though emergency conditions are not typically required to be modeled, these data are provided as part of the analysis for informational purposes only.

C. Other Modeling Considerations

Ozone

An assessment to estimate the impact on ozone from the proposed facility's NO_X and VOC emissions was conducted. The conservatively calculated impact was approximately 0.05 parts per billion (ppb) of ozone. The monitored ozone design value for the area is approximately 59 ppb for the period 2017 through 2019. This results in a total design value equal to 59.05 ppb which is well below the 8-hour ozone NAAQS of 70 ppb.

ATTACHMENT E - PUBLIC PARTICIPATION REPORT (INCLUDING REPRESENTATIVE SAMPE OF WRITTEN COMMENTS)

Actual comments not attached due to # of pages.
Page E-5 thru E-9 list all commenters. If there is a page number next to the commenter name, full text of that comment is included in Board book minus any lengthy attachments.

Attachment E – Public Participation Report

Lambert Compressor Station

This report contains the following sections:

1. List of Recipients of the Email and Postal Mail Notifications & Outreach Meeting
2. List of Commenters from the Public Comment Period
3. Copy of the actual comments that were received

Social Media Efforts

- Twitter (4 tweets)
- Facebook (5 posts)
- Nextdoor (4 notifications)
- Constant Contact (4 emails)

Social media posts were viewed 6,725 times.

Other Outreach

- Radio PSA on WAKG (Danville) and WKBY (Chatham)
- Draft permit for the proposed project sent to the Chatham main library (and Bookmobile) and the Chatham History Research Center and Library

Attachment E – Public Participation Report

Lambert Compressor Station
List of Recipients of the Email and Postal Mail Notifications & Outreach Meeting

Four email notifications were sent:

- December 17, 2020 – Comment period, briefing and hearing announcement
- January 6, 2021 – Briefing Reminder
- February 4, 2021 – Hearing Reminder
- March 9, 2021 – Comment Period Extension

Three separate postal mail notifications were sent.

Staff attended one virtual meeting.

Email Notifications

Chatham Baptist Church
Cornerstone Church of Christ
Emanuel Episcopal Church
Heritage Academy
Hollywood Baptist Church
Marion Baptist Church
New Bethel Church of the Brethren
Open Bible Baptist Church
Shockoe Missionary Baptist Church
Gods Final Call and Warning Inc.
Chestnut Level Baptist
Watson Memorial United Methodist
The Word Church
Chatham Christian Church
Concord United Methodist Church
Green Rock Gasemane Pentecostal Faith Church
Aglow International
Alternative School
Career & Tech Center
Chatham High School (3 recipients)
Chatham Elementary School (2 recipients)
Chatham Middle School (3 recipients)
Hargrave Military Academy (3 recipients)
Pittsylvania County School (8 recipients)
PCCA Headstart
Pittsylvania County Health Department
Chatham Health and Rehabilitation Center
Paths Community Medical Center (4 recipients)

Pittsylvania County Community Action Inc. (7 recipients)
North Carolina DENR
Chatham Town Manager
Chatham Treasurer
Mayor of Chatham
Chatham Town Council (6 recipients)
Pittsylvania County Board of Supervisors (8 recipients)
Pittsylvania County Director
Pittsylvania County Deputy Director
Pittsylvania County – County Administrator
Pittsylvania County Industrial Development Authority
Virginia House and Senate District 5 members (2 recipients)
West Piedmont Planning District
Mattaponi Tribe
Pamunkey Tribe
Chickahominy Tribe
Eastern Chickahominy Tribe
Rappahannock Tribe
Upper Mattaponi Tribe
Monacan Indian Nation
Cheroenhaka Tribe
Nottoway of Virginia Tribe
Patawomeck Tribe
DEQ PSD Mailing List (74 recipients) – persons signed up to receive PSD permit notifications
Chatham Rotary Club
Media (7 recipients)
Misc. (Nonprofits, VEJC – 25 recipients)

Postal Mail Notifications

Watson Level Missionary Baptist Church
Whitestone Church
Wilson Memorial Baptist Church
Pittsylvania County Public Library
Union Hall Elementary
Victory Academy
Angel Wings Home Care
Chatham Family Medical Center
Peace Haven Home Care Services
Lighthouse Deliverance Center
Chatham Lions Club
Nansemond Indian Nation
Callands Missionary Baptist Church
Chatham Pentecostal Holiness Church
Chatham Presbyterian Church
Cherrystone Baptist Church
Clark Town Presbyterian Church
Corinth Christian Church
First Community Church
First United Holiness Church
Greater Triumph Baptist Church
Green Pond Baptist Church
Green Rock Gasemane Pentecostal Faith Church
Gretna Church of God of the Prophecy
Jesus Gospel Church
Life Line Gospel Church
Macedonia Baptist Church
Mill Creek Community Church
Museville Christian Church
New Hope AME Church

New Life Apostolic Church
New True Vine Holiness
Oak Ridge Christian Church
Rosebud Baptist Church
Saint Paul Outreach Center
Salem Church of Christ
Samuel Harris memorial Baptist Church
Sheva Church of Christ
Spring Garden Presbyterian Church
Strawberry Primitive Baptist Church
Union Hall Baptist Church
Union Primitive Baptist Church
Mattaponi Tribe
Pamunkey Tribe
Chickahominy Tribe
Easter Chickahominy Tribe
Rappahannock Tribe
Upper Mattaponi Tribe
Nansemond Tribe
Monacan Indian Tribe
Cheroenhaka (Nottoway) Tribe
Nottoway of Virginia Tribe
Patawomeck Tribe
Chatham Baptist Church
Chatham Christian Church
Chatham Pentecostal Holiness Church
Chatham Presbyterian Church
Cherrystone Baptist Church
Clark Town Presbyterian Church
Concord United Methodist Church
Corinth Christian Church
Cornerstone Church of Christ
Emanuel Episcopal Church
Heritage Academy
Hollywood Baptist Church
Leroy Jones Evangelistic Church
Marion Baptist Church
New Bethel Church of the Brethren
Open Bible Baptist Church
Rosebud Baptist Church
Shockoe Baptist Church
Shockoe Missionary Baptist Church
Watson Memorial United Methodist
The Word Church
Pittsylvania County Community Action Inc.
Pittsylvania Economic Development
Pittsylvania County Public Library
Alternative School
Career & Tech Center
Chatham High School
Chatham Elementary School
Chatham Middle School
Chatham Hall
Hargrave Military Academy
Union Hall Elementary
Pittsylvania County Schools
Victory Academy
Angel Wings Home Care
Chatham Family Medical Center
Chatham Health and Rehabilitation Center
Paths Community Medical Center
Peace Haven Home Care Services
Aglow International
Gods Final Call and Warning Inc.
Chestnut Level Baptist
Lighthouse Deliverance Center
PCCA Headstart
Pittsylvania County Health Department

Virtual Meeting Attended

Pittsylvania County NAACP Meeting
1-5-2021

Attachment E – Public Participation Report

Lambert Compressor Station
List of Commenters

01/30/21	Edward Savage E-10
01/30/21	Liane Salgado E-12
01/31/21	Kristin Peckman E-15
02/02/21	Alexander Pellegrino E-16
02/02/21	Cynthia Munley
02/02/21	Shelley Tamres E-17
02/03/21	Crystal Cavalier-Keck E-20
02/03/21	Gerald Featherstone
02/04/21	Betty Byrne Ware
02/04/21	Patricia Taylor
02/04/21	Susie Eastridge
02/05/21	Carolyn Barker
02/05/21	Mary Harshfield
02/08/21	Anderson/Elizabeth Jones
02/08/21	Anderson/Elizabeth Jones
02/08/21	Albert Kenneke
02/08/21	Alden Dudley
02/08/21	Anita Royston
02/08/21	Benjamin Cuker
02/08/21	Beth Stockner
02/08/21	Brian Crockett
02/08/21	Bryden Ross
02/08/21	Chadwick Dotson
02/08/21	Chris Lund
02/08/21	Christina Akly
02/08/21	Crystal Cavalier-Keck
02/08/21	David Smitherman
02/08/21	Doug Mace
02/08/21	Charles H. Miller Jr
02/08/21	Elle De La Cancela
02/08/21	Freeda Cathcart
02/08/21	Geoffrey Cox
02/08/21	Gretchen Clark
02/08/21	Irene Leech
02/08/21	Irene Leech
02/08/21	Jason Campos-Keck
02/08/21	Jessica Sims
02/08/21	Jessie Barksdale
02/08/21	John Harris
02/08/21	Jolene Mafnas
02/08/21	Joshua Vana
02/08/21	Katie Whitehead
02/08/21	Kay Ferguson
02/08/21	Lee Williams
02/08/21	Leslie Witherspoon
02/08/21	Lib Hutchby
02/08/21	Lynn Godfrey
02/08/21	Madigan Weidner
02/08/21	Mark Barker
02/08/21	Mary Finley-Brook
02/08/21	Michelle Goldberg
02/08/21	Nicholas Morris
02/08/21	Richard Shingles
02/08/21	Ridge Graham
02/08/21	Robert McNutt
02/08/21	Robert Warren
02/08/21	Ronald Scearce
02/08/21	Friederich Limbach
02/08/21	Shawn Day
02/08/21	Sonja Ingram
02/08/21	Steven Pulliam
02/08/21	Tiona McKinney
02/08/21	Tiona McKinney
02/08/21	Travis Williams
02/08/21	Tyla Matteson
02/08/21	Virginia Pannabecker
02/08/21	William Limpert
02/08/21	William Limpert
02/09/21	Michael James-Deramo
02/09/21	Nan Gray
02/09/21	Robert Ukeiley
02/10/21	Jess Daddio E-59
02/10/21	Kelly Paduch
02/12/21	Cynthia Munley
02/14/21	Ryan Wesdock
02/18/21	Lynn A. Godfrey

02/19/21	Friederich Limbach
02/22/21	Nan Gray
02/22/21	Nan Gray
02/22/21	R. Stockton Maxwell
02/25/21	Scott Noonkester
02/26/21	Ellen Brown
02/26/21	Kristin Peckman
02/27/21	Bruce M. Coffey
03/01/21	EPA R3
03/01/21	Les Reynolds
03/01/21	Richard Shingles
03/02/21	John Surr
03/02/21	Michael Bentley
03/02/21	William Limpert
03/03/21	Kelsey Condon
03/04/21	Anita Royston E-23 (NAACP)
03/04/21	Margaret Sims
03/04/21	Mark Barker E-32 (BREDL)
03/04/21	Phil Mauger
03/05/21	A Dean Caulifield
03/05/21	Adam DOnofrio
03/05/21	Alex Niconovich
03/05/21	Alison Laurio
03/05/21	Amanda Pagay
03/05/21	Amy Cleveland
03/05/21	Andrew Trowbridge
03/05/21	Arthur Leibowitz
03/05/21	Barbara Seaman
03/05/21	Blaine Converse
03/05/21	Brad Yoho
03/05/21	Brian Dunn
03/05/21	Brooke Kane
03/05/21	Bruce Rauscher
03/05/21	Bruce Supporter
03/05/21	Carol Metzger
03/05/21	Carol Miller
03/05/21	Carol Pruner
03/05/21	Charlotte Shnaider
03/05/21	Cheryl Arthur
03/05/21	Christopher Dunn
03/05/21	Cristeena Naser
03/05/21	Cynthia Howell
03/05/21	Cynthia Lonas
03/05/21	David Newlin
03/05/21	David Scherer
03/05/21	David White
03/05/21	Debbie Clark
03/05/21	DeeDee Tostanoski
03/05/21	Donald Motley
03/05/21	Donna Pitt
03/05/21	Eileen Embid
03/05/21	Elizabeth Ketz-Robinson
03/05/21	Elizabeth Spiher
03/05/21	Elizabeth Struthers
03/05/21	Ellen Atkinson
03/05/21	Ellen Kabat
03/05/21	Elliot Daniels
03/05/21	Fred Reid
03/05/21	Frederick Worth
03/05/21	Gene Cochran
03/05/21	Gina Macias
03/05/21	James Hartley
03/05/21	Janice Porter
03/05/21	Jeffrey Schnebelen
03/05/21	Jennifer Keys
03/05/21	Jennifer Tulo
03/05/21	John Hitchins
03/05/21	John Rosapepe
03/05/21	Joshua Capps
03/05/21	Judith Zwelling
03/05/21	K.L. Eckhardt
03/05/21	Karen Spurr
03/05/21	Kay Reibold
03/05/21	Barry Duval
03/05/21	Krista Powell
03/05/21	Kristen Mattioni
03/05/21	Lawrence Jacksina
03/05/21	Linda Centorrinio
03/05/21	Linda Hertz
03/05/21	Lisa Kingsley
03/05/21	Lynn Gravelle
03/05/21	Margaret Dyson-Cobb

03/05/21	Marilyn Clark
03/05/21	Mark Nuckols
03/05/21	Mary Armstrong
03/05/21	Mary Barhydt
03/05/21	Mary Keller
03/05/21	Mary Miller
03/05/21	Maurice Royster
03/05/21	Michele Shave
03/05/21	Morgan Lazenby
03/05/21	Norma Riley
03/05/21	Pat Mace
03/05/21	Patricia Daniels
03/05/21	Patricia Holbrook
03/05/21	Peter Sayre
03/05/21	Raymond Nuesch
03/05/21	Robert O'Brien
03/05/21	Sally Mckee
03/05/21	Sandra Uribe
03/05/21	Sarah Vickers
03/05/21	Shannon Roth
03/05/21	Stacy Sallerson
03/05/21	Susan Heytler
03/05/21	Susan Kalan
03/05/21	Terry Kelly
03/05/21	William Dent
03/05/21	William Huddle
03/05/21	William Staley
03/05/21	William Welkowitz
03/06/21	Barbara McCane
03/06/21	Charity Moschopoulos
03/06/21	Cindy Speas
03/06/21	Darek Powell
03/06/21	David Addison
03/06/21	Donna Shaunesey
03/06/21	James Jeffrey
03/06/21	Jessica Cassidy
03/06/21	Kath Zentz
03/06/21	Linda McDougal
03/06/21	Lindsay Pugh
03/06/21	Marilyn Anderson
03/06/21	Nancy Glynn
03/06/21	Pamela Jiranek
03/06/21	Ruth Steenwyk
03/06/21	Sarah Lanzman
03/06/21	Valeria Joseph
03/06/21	Vicki Nelson
03/06/21	Virginia Abraham
03/06/21	Zacharay Millimet
03/07/21	Agnes Hetzel
03/07/21	Amelia Williams
03/07/21	Annie Parr
03/07/21	Coutney Frierson
03/07/21	David Guillaudeu
03/07/21	Debra Shah
03/07/21	Edward Savage
03/07/21	Gail White
03/07/21	Irwin Flashman
03/07/21	Jean Washburn
03/07/21	Jessica Henao
03/07/21	Josh Pucci
03/07/21	Lara Akdol
03/07/21	Max Emerson
03/07/21	Megan Shepherd
03/07/21	Nancy Tingen
03/07/21	Pamela Mullins
03/07/21	Ron Edwards
03/07/21	Russ Hopler
03/07/21	Steve Tingen
03/08/21	Becky Robinson
03/08/21	C. Kasey
03/08/21	Janet Roundtree
03/08/21	Jessica Alley
03/08/21	Kathy Stark
03/08/21	Kenda Hanuman
03/08/21	Nora Pfeiffer
03/08/21	Rhonda Johnson
03/08/21	Teresa McCartney
03/08/21	Walter Moore
03/09/21	Amanda Yoder
03/09/21	Anhthu Lu
03/09/21	Anne Little
03/09/21	Barbara Coleman-Brown

03/09/21	Becky Daiss
03/09/21	Beth Kreydatus
03/09/21	Brendan Meehan
03/09/21	Casandra Monroe
03/09/21	Chanelle Jones
03/09/21	Chris Saxman
03/09/21	Del Christ Hurst (5)
03/09/21	Cynthia Munley
03/09/21	Daniel Dalton
03/09/21	DaQuan Love
03/09/21	Darrlynn Franklin
03/09/21	Debra Copeland
03/09/21	Diana Burruss
03/09/21	Dianne Hazzard
03/09/21	Douglas Broome
03/09/21	Elizabeth Hendrix
03/09/21	Frank Callahan
03/09/21	G Fay Allen
03/09/21	Gale Jones
03/09/21	Glen Besa
03/09/21	Gracie Patten
03/09/21	James Ghee
03/09/21	James Minor
03/09/21	John/Judith Bevans
03/09/21	Julia Durand
03/09/21	Juliet Hiznay
03/09/21	Karen Jones
03/09/21	Katherine Carpenter
03/09/21	Mark Gregory
03/09/21	Mark Lomax
03/09/21	Mary Baumeister
03/09/21	Mary Ellen Stahley
03/09/21	Max Knight
03/09/21	Michael Knez
03/09/21	Mike Sims
03/09/21	Patricia Jordan
03/09/21	Raynard Moore
03/09/21	Robert Perry
03/09/21	Robert Sayles Jr
03/09/21	Shirley Akers
03/09/21	Stacy Lovelace
03/09/21	Stephanie Burns
03/09/21	Sue Wilson
03/09/21	Susan Boyd
03/09/21	Sylvia C Wood
03/09/21	Thalia Hernandez
03/09/21	Uwe Dotzauer
03/09/21	Wendy Hobbs
03/10/21	Allison Zec
03/10/21	Everett Lewis
03/10/21	Glenda Kohlhafer-Regan
03/10/21	Sarah Creel
03/10/21	Shirley Akers
03/10/21	Susan DeMasi (6)
03/10/21	Tiffany Haworth
03/10/21	Virginia Pannabecker
03/12/21	Sherman Saunders
03/15/21	Russell Chisholm
03/16/21	Caroline Hansley
03/16/21	Ingrid Mans
03/16/21	Kay Ferguson
03/16/21	Robert McNutt
03/17/21	Elisabeth Chan
03/17/21	Susan Smith
03/18/21	Amelia Williams
03/18/21	Emily Satterwhite
03/18/21	Glen Besa
03/18/21	Lynn Godfrey
03/18/21	Michael James-Deramo
03/19/21	Anna Hebner
03/23/21	Hannah Scherer
03/23/21	Jorge Aguilar
03/23/21	Woodie Walker
03/24/21	Beth Kreydatus
03/25/21	Roderick Harrison
03/27/21	Abinaya Venkatesan
03/27/21	Aerin Cuff
03/27/21	Ben Rhoades
03/30/21	Brad Pearce
04/02/21	Tina Smusz
04/03/21	Marc Koslen
04/05/21	Brian Jackson

04/05/21 Catherine Carver
04/05/21 Cathryn McCue
04/05/21 Geraldine Fatundimu
04/05/21 William Limpert
04/06/21 Natalie Pien
04/07/21 Ann Marckesano
04/07/21 Audrey Clement
04/07/21 Christine Ilich
04/07/21 Debbie Freeman
04/07/21 Derek Meyer
04/07/21 Robert Burnette
04/07/21 Janice Brown
04/07/21 Josie Taylor-Soltys
04/07/21 Judith Freeman
04/07/21 Julianna Luecke
04/07/21 Julianna Luecke
04/07/21 Kelsey Romano
04/07/21 Lynda West
04/07/21 Lynn Oglesby
04/07/21 Mollee Sullivan
04/07/21 Sapna Batish
04/07/21 Sarah Jordan
04/07/21 Shae Savoy
04/07/21 Stephanie Clark
04/07/21 Suzanne Hurley
04/07/21 Thomas Smith
04/07/21 William Pace
04/08/21 Daniel Lambert
04/08/21 Deborah Roney
04/08/21 Eddie Herndon Jr
04/08/21 Elle De La Cancela
04/08/21 Emily Sutton
04/08/21 Grace Tuttle
04/08/21 Jacob Hileman
04/08/21 Jose Cruz
04/08/21 Martha Girolami
04/08/21 Del Les Adams
04/08/21 Suzanne Keller E-60
04/08/21 Tina Smusz
04/09/21 Brooke Mason
04/09/21 Christina Akly E-65 (MVP)
04/09/21 Christopher Lund
04/09/21 Cynthia Munley
04/09/21 Doug Wellman
04/09/21 Emily Satterwhite
04/09/21 Evan Johns (6) E-80 (CBF + App. Voices
04/09/21 Evan Johns
04/09/21 Georgianne Stinnett
04/09/21 Grace Tuttle
04/09/21 Irene Leech
04/09/21 Jessica Sims
04/09/21 Jolene Mafnas
04/09/21 Kay Ferguson
04/09/21 Kristin Hoffman
04/09/21 Kristin Hoffman
04/09/21 Lakshmi Fjord E-150
04/09/21 Lakshmi Fjord
04/09/21 Luke May
04/09/21 Lynda Majors
04/09/21 Mark Sabath (8) E-163 (SELC)
04/09/21 Mark Sabath
04/09/21 Mary Finley-Brook E-206
04/09/21 Maury Johnson
04/09/21 Nicholas Polys
04/09/21 Sen. John Edwards
04/09/21 Sharon Wilson
04/09/21 Simone Paterson
04/09/21 Susan Scerbo
04/09/21 Tina Smusz
04/09/21 Robert Barnette (1) E-228 (NAACP)
04/09/21 Virginia Pannabecker E-232

Archived: Wednesday, February 3, 2021 3:32:07 PM
From: Ned Savage
Sent: Saturday, January 30, 2021 8:17:50 PM
To: anita.walthall@deq.virginia.gov
Subject: anita.walthall@deq.virginia.gov
Importance: Normal

Ms. Walthall,

My name is Edward Savage of Catawba, VA. I'm writing to ask that the proposed Lambert Compressor station, a 27,756-horsepower fossil fuel facility that would emit carbon monoxide, nitrogen oxides and formaldehyde, be elevated to the Air Pollution Control Board, for the following reasons:

Lack of information regarding Hazardous Air Pollutants (HAPs)

- The only hazardous air pollutant that is subject to hourly and yearly emission limits in the draft permit is formaldehyde.
- There were several other hazardous air pollutants listed during the Environmental Impact Statement process including benzene, toluene and xylenes that can cause adverse health effects but are not listed in this air permit.
- Factoring in the emission levels of hazardous air pollutants generated by the two Transco compressor stations, the cumulative impact from those and the proposed Lambert facility would be more than 25 tons per year and would require a Clean Air Act Title V major source air pollution permit. MVP assumed this location would be acceptable because they could blend their emissions in with the existing compressor stations. However, the Lambert facility would put the nearby community over the limit in terms of risk of adverse health effects.

Health concerns

- Formaldehyde in the air can lead to nasal and skin irritation as well as breathing problems. Formaldehyde can also increase complications of existing COPD and asthma. Higher concentrations of it can lead to tumor formation and pulmonary edema.
- MVP predicts that the Lambert Compressor Station will emit almost 9 pounds of formaldehyde an hour, on top of the background rate of 19 tons/year emitted by the Transco compressor stations 165 and 166.
- The proposed Lambert station would increase the emissions of particulate matter in the area by almost 30%.
  The percentage of people over the age of 64 in the nearby community is significantly higher than the state and national average. Older people are more vulnerable to particulate matter pollution, especially with increased rates of cardiorespiratory mortality and hospitalization.
- Chronic levels of air pollution also can increase the rates of respiratory tract infections such as pneumonia.
  In the Environmental Impact Statement, MVP projected that the Lambert compressor station would emit over 69 pounds of benzene annually. Acute chronic exposure (0.1 to 0.5 ppm) to benzene can reduce white blood cell counts, which is the most common indicator for leukemia risk.

Environmental Justice concerns

- The permit's EJ Screen was conducted by census tract, not the more accurate census block data and therefore, the project's real impact may be under-estimated.
- There are serious discrepancies between the information MVP's consultant provided in the EJ Analysis Report, and what MVP ultimately communicated in its final permit application.
- Four EJ communities were identified within a 3-5 mile radius of the proposed compressor station site. MVP's September 2020 revised permit application to DEQ used data from a 1-mile radius only, even though the consultant's report on MVP accepted screening within a 3-mile radius.
- There are serious and significant discrepancies between the information provided in the EJ Analysis Report conducted for MVP, and what MVP ultimately communicated in their final version of the permit application.

ATTACHMENT F - SUMMARY OF AND RESPONSE TO PUBLIC COMMENTS

Corrected 6/18/21

Mountain Valley Pipeline LLC, Lambert Compressor Station
Registration Number 21652
Article 6 Draft Permit: 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 Lambert Compressor Station (LCS) appeared in the *Chatham Star Tribune* on December 16, 2020, announcing a comment period from January 8 until March 9, 2021; an informational briefing and a public hearing to follow. The draft permit and engineering analysis were posted to the DEQ public notice website and the Blue Ridge Regional Office for review.

Informational Briefing

The informational briefing was held virtually on January 7, 2021 pursuant to Budget item #4-0.01 of the 2020 Acts of Assembly (Special Session 1). At the briefing, 34 persons registered to attend. Paul Jenkins (Air Permit Manager) and Anita Walthall (Air Permit Writer) presented fundamentals of the air permitting process and details of the proposed LCS permit.

Prior to the end of the public comment period, Director Paylor extended the public comment period until April 9, 2021.

Public Hearing

The public hearing was held virtually on February 8, 2021 pursuant to Budget Item #4-0.01 of the 2020 Acts of Assembly (Special Session 1). For the hearing, 168 persons registered to attend. Paul Jenkins, Air Permit Manager, was the hearing officer for the public hearing. During the public hearing, oral comments were received from 49 individuals. Some speakers summarized their comments orally and submitted written comments for the record.

Comments Received

During the comment period, 300 emails were submitted. The majority of the comments received were general in nature, mostly consisting of various form letters with some slight individualization. DEQ also received 3 written comments via postal mail that were a duplicate of the email comment submitted. DEQ received comments from 29 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 is providing this document to respond to these comments prior to proposing a final permit to 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.

I. General Comments

LCS-1 Comment

Comments were received in support of the Lambert Compressor Station (LCS) and the Mountain Valley Pipeline (MVP) and comments were received in opposition to the draft air permit and MVP. 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: air measures taken are higher than that required by law, no adverse effect on air emissions, no destruction has been witnessed, emissions are not environmental preferable, allow no emission increase, outdated technology is being used. These comments centered either on 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 of eminent domain, noise, soil and water quality, radioactive materials, facility decommissioning, pipeline necessity, pipeline schedule and impact, infrastructure abandonment, energy infrastructure or sourcing (e.g., fracking, fossil fuel) of the United States, requiring funds to pay for impacts, economics, an emergency plan, and MVP litigation(s).

DEQ Response

Eminent domain, noise, soil and water quality, radioactive materials, facility decommissioning, pipeline necessity, pipeline schedule and impact, infrastructure abandonment, energy infrastructure or sourcing, requiring funds to pay for impacts, economics, an emergency plan, and MVP's legal matters are topics beyond the purview of the Regulations for the Control and Abatement of Air Pollution which 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, 9VAC5 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 LCS to demonstrate compliance with the standards in the air in Pittsylvania 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 LCS.

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.

II. Other Comments

As described above, the standardized opposing comments were general in nature and did not suggest any specific improvements or changes to the draft permit. Some references were made to analyses contained in DEQ's engineering analysis document. Many of these comments requested the denial of the draft permit as written and also requested that the proposed facility's emissions be combined with the adjacent stations' emissions for

cumulative emissions. The general comments also expressed concerns regarding other toxic pollutants or hazardous air pollutants (HAPs), NAAQS, Risk assessment, radioactive elements, safety, fugitive emissions (leaks), particulate matter, outreach, site suitability, source type, other procedural concerns, BACT, draft documents, environmental justice, and modeling.

Cumulative Emissions/Common Control

LCS-2 Comment

Comments said the proposed LCS must be permitted as a Title V facility combining its emissions with emissions from the Transco compressor stations based on the EPA principle of common control.

DEQ Response

DEQ understands this request is to explain why the proposed LCS and Transco Stations 165, 166 emissions are not aggregated for the purpose of this draft air permit. This question relates to the determination of a stationary source for permitting purposes. Pursuant to 9VAC5-80-1180, a "stationary source" is defined as "any building, structure, facility, or installation that emits or may emit any regulated air pollutant" and includes…"all of the pollutant-emitting activities that belong to the same industrial grouping, are located on one more contiguous or adjacent properties, and are under the control of the same person or of persons under common control." LCS and Transco belong to the same industrial group (486210), are located on contiguous or adjacent properties, but are not under the same control. LCS (DEQ registration 21652) is owned by MVP. The neighboring Transco stations 165 and 166 have (DEQ registration 30864) and are owned by Transcontinental Gas Pipe Line Co. For air pollution control purposes, neither facility has the power or authority to dictate decisions of the other that could affect the applicability of, or compliance with, relevant air pollution regulatory requirements. Therefore, DEQ concludes that LCS is not under common control of Transco and the two entities are not a single stationary source for title V purposes.[1]

State Toxics (Hazardous Air Pollutants)

LCS-3 Comment

Comments said other HAPs such as benzene, toluene and xylenes are not listed in the draft air permit.

Comments said the proposed LCS will emit almost 9 pounds of formaldehyde an hour.

---

[1]USEPA Letter to Patrick McDonnell PADEP, April 30, 2018.

DEQ Response

Toxic pollutants (or HAPs) were 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 LCS. Only one HAP, formaldehyde, exceeded the exemption rates contained in 9VAC5-60-300,[2] and was therefore subject to permitting, require BACT, and an air quality analysis under the toxics rule. DEQ also included hexane emissions in the air quality analysis. The air toxic model for formaldehyde (and hexane) concentrations at various operating loads (and scenarios) were compared to Virginia's Significant Ambient Air Concentration (SAAC). The model results showed predicted formaldehyde (and hexane) concentrations do not exceed the respective significant air toxics concentrations. The draft's permit maximum formaldehyde emission limitation can be verified by combining hourly emission from standard operations of all turbines, the heater, and include emissions from startup and shutdown operations. The total formaldehyde emission rate is 2.4 lb/hr.

As mentioned above, the maximum formaldehyde emission rate was modeled and found to be in compliance with the SAAC. The major contributor to this emission rate is simultaneous startup operations of combustion turbines, Mars 100 and Taurus 70. LCS projects actual startup operations to last approximately 10 minutes (~1.438 lb/hr), DEQ modeled the worst case emission rate of 8.990 lb/hr.

National Ambient Air Quality Standards (NAAQS)

LCS-4 Comment

Comments say the NAAQS are insufficient and vulnerable populations are not protected.

Comments express concern over the proposed LCS' interference with the NOx 1-hr NAAQS was expressed.

DEQ 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

[2]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.

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.

The applicant provided a Public Health Assessment performed by Green Toxicology, LLC. The purpose of the assessment was to assess any diverse impacts of airborne emissions from the LCS on public health. The Public Health Assessment concluded that "the health of people living near the proposed LCS is not currently being compromised by the quality of outdoor air; and if the proposed station were to be built and operating, this situation would not change."

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 (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2).

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 LCS, the modeling analysis demonstrates that the 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. As further discussed in the responses to comments 19-21, DEQ's consideration of the air quality impacts from the proposed LCS was both comprehensive (cumulative and source-specific, individual property and EJ-community basis, worst-case parameters and operating conditions, the particular applicability of the NAAQS) and detailed.

See modeling section for specific response to 1-hr NAAQS.

Risk Assessment

LCS-5 Comment

Comments say an independent comprehensive health risk analysis or a health study should be performed that doesn't rely solely upon the NAAQS and include actual conditions.

Comments say there's a need for risk assessment prior to the proposed project and it should include health assessments with VDH and in-home monitoring for area residents should be required.

Reports identified as Southwest Pennsylvania Environmental Health (Health Effects Associated with Stack Chemical Emissions from New York State Natural Gas Compressor Stations: 2008-2014) and other reports relating health conditions to oil and gas development operations were referenced.

DEQ 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 LCS 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 LCS. One of these HAPs, formaldehyde exceeded the exemption rates contained in 9VAC5-60-300,[3] requiring BACT and an air quality analysis under the toxics rule. Additionally, hexane was included in the analysis. 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 LCS demonstrates compliance with the applicable Significant Ambient Air Concentrations (SAACs).

Two reports, the *Health Effects Associated with Stack Chemical Emissions from New York State Natural Gas Compressor Stations* and *Air Emissions from Natural Gas Facilities in New York State* share the same author and some data overlap. Both reports use emission data from the US EPA's National Emissions Inventory (NEI) from 18 natural gas compressor stations (NAICS 48621) during 2008 to 2014. The second report is supplemented with data from Greenhouse Gas Inventory, Homeland Security and the NY Department of Environmental Conservation. The report identifies the compressor stations referenced in the study as Title V sources. Both reports include a list of diseases that may be associated with "chemicals" released from the stack. However, the reports do not demonstrate that the proposed LCS' emissions will have an adverse impact on human health.[4]

Other health studies reviewed pollutant emissions near oil and gas development sites (drilling, fracturing, etc.) that sometimes include pipelines, and compressor stations. However, the proposed LCS is not in the same source type as oil and gas development (extraction) operations (NAICS 213112).

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 exposed[5]. When the predicted concentrations were compared to the individual pollutant standards, compliance was shown in each case. As further discussed in the responses to

[3] 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.

[4] Memo, Green Toxicology, LLC, March 29, 2021.

[5] Some comments referenced modeling for SO_2, which does not have an ambient air quality standard. Assuming all sulfur in the natural gas was H_2S, 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 19-21, DEQ's consideration of the air quality impacts from the proposed LCS was both comprehensive (cumulative and source-specific, individual property and EJ-community basis, worst-case parameters and operating conditions, the particular applicability of the NAAQS) and detailed.

Safety

LCS-7 Comment

The proposed LCS along with the neighboring stations and gas infrastructure puts the community at an increased risk of 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.

The locality would have an emergency response plan since a similar facility already exists in the area. Mountain Valley is required to submit Tier II reports to the State and County, as required under Section 312 of the Emergency Planning and Community Right to Know Act of 1986 (EPCRA). These reports provide State, local officials, and the public with specific information on potential hazards and give critical information to first responders in the event of an emergency. In addition, all employees working at the proposed LCS would undergo proper training for routine maintenance, safe operations and emergency response. It is also worth noting that the locality not only would accurately quantify the emissions from an unknown future emergency, any excess emissions due to negligence would be addressed as violations.

The air permitting regulations do not regulate worker safety risk as proposed by commenters, and nothing indicates that such an unprecedented step is warranted here. LCS air emissions are addressed above. The other risks are covered by comprehensive state and federal regulations, as well as LCS procedures and protocols.

As part of an interstate pipeline, the proposed LCS is subject to stringent requirements of and approval from, the federal Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA administers the national regulatory pipeline safety program for the nation's interstate and intrastate pipelines and requires that pipeline operators design, construct, test, operate, and maintain their pipeline facilities in compliance with the federal pipeline safety regulations. The PHMSA pipeline standards are published in 49 CFR 190-199.

Moreover, the Board issues air permits pursuant to regulations authorized by Va. Code § 10.1-1308, which grants the Board "the power to promulgate regulations, including emergency regulations, abating, controlling and prohibiting *air pollution* throughout or in any part of the Commonwealth"(§10.1-1308.A, emphasis added). Even if requiring some form of risk assessment could be justified in extraordinary circumstances, those circumstances do not exist here. Commenters have not submitted sufficient information for DEQ or the Board to justify departing from their statutory authority related to impacts from air emissions, especially given the existing oversight and authority of Federal and local government authorities and the broader analyses already conducted in the Environmental Assessment under the National Environmental Policy Act.

Fugitive Emission (leaks)

LCS-8 Comment

Constructing the proposed LCS increases risk of gas leaks. Reports were cited that discussed leaks from transmission lines and compressor stations.

The data used to calculate fugitive emissions (leaks) is no longer accurate.

DEQ Response

In order to establish control of fugitive emissions (natural gas leaks) from the proposed LCS, the federal emission standard for oil and natural gas sectors, (40 CFR 60 subpart OOOOa) is relevant. 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 has reviewed other permits and requirements for natural gas compressor stations and has not found a lesser frequency (e.g., daily) for LDAR surveys. Daily AVO and quarterly LDAR surveys are considered as BACT and appear to represent the most stringent requirements for natural gas compressor stations. 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. Pigging events vent natural gas during the pig insertion/removal. Emissions during pigging events are expected, quantified, and limited in the draft permit.

The applicant used emission factors from 40 CFR Part 98, Table W-1A, to estimate component fugitive leak emissions (6/30/20 application, Table B-10). The engineering analysis statement has been revised to reflect this information.

a) *Regarding condition 7b, (time allowed to repair leaking components), there is no maximum deadline for repairing long term leaks.*

DEQ Response

DEQ conducted a review of available permits as well as the applicable NSPS OOOOa to determine an appropriate timeframe for repair. The NSPS 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.

Outreach

LCS-9 Comment

Comments said public outreach efforts were inadequate for communities of color. The information should reach the affected community during a time and in a way that is useful to them, making sure they have opportunity to provide input.

Comments said community members did not receive timely notice of the proposed LCS permit review process.

Comments concerning the proposed LCS and air quality impact, said the residents of Pittsylvania County should be educated, allowed to think for themselves and given the opportunity to comment.

DEQ Response

In addition to the applicable air regulatory requirements, the VEJA makes clear a policy in the Commonwealth to promote environmental justice, which includes meaningful involvement. Meaningful involvement is defined by VEJA as "the requirements that (i) affected and vulnerable community residents have access and opportunities to participate in the full cycle of the decision-making process about a proposed activity that will affect their environment or health and (ii) decision makers will seek out and consider such participation, allowing the views and perspectives of community residents to shape and influence the decision."(Va. Code § 2.2-234). VEJA became effective on July 1, 2020. Additionally, in another Code provision effective July 1, 2020, DEQ is charged to "further environmental justice and enhance public participation in the regulatory and permitting processes."(Va. Code § 10.1-1183).

In addition to the regulatory comment and hearing process, significant efforts were undertaken to inform and engage the community regarding the proposed LCS in a timely manner. The Virginia air permitting requirements set forth the following public participation process for minor NSR permits (9VAC5-80-1170) and localities particularly affected (§10.1-1307.01):

1. Public notice of the proposed source at least 30 days prior to the close of the comment period. [Published December 16, 2020 in the local paper and posted on the DEQ and MVP websites].

2. A public comment period of at least 30 days. [The public comment period started on January 8, 2021 and was extended until April 9, 2021].

3. A public hearing, during the public comment period, so that comments may be received verbally as well as in writing. [Public hearing held February 8, 2021, *virtual*].

4. Written comments shall be accepted for at least 15 days after the hearing. [Written comments were accepted 60 days after the hearing).

5. Notice of the public comment period and public hearing provided directly to local air pollution control agencies, Native American Indian tribes, the chief elected official of Pittsylvania County and chief administrative officer of the Chatham, Virginia, and the planning district commission for Pittsylvania County. [Completed].

DEQ met all of the regulatory requirements and went beyond those requirements to assure as many people as possible were aware of this permit action and of the opportunity to comment on the draft permit. Additional outreach included, announcing the public notice via social media accounts such as Facebook, Twitter, Instagram and Constant Contact on December 16th and 17th of 2020. Due to the on-going COVID-19 pandemic,[6] DEQ adapted its outreach by utilizing virtual meetings, teleconferences, and the electronic notification platforms aforementioned. During this time, a public notice was also distributed by postal mail (and email when available) to DEQ's regulatory mailing list and over 60 stakeholders within Pittsylvania County. The expanded mailing list was distributed to areas such as Pinhook, Gretna, Blairs, Chatham, Axton, Vernon Hill and Quinton. This outreach including mailings to entities such as local schools, educational centers, businesses, tribal and governmental organizations, elected officials, libraries, a local grocery, and religious organizations. Since the timing of the original notice occurred prior to the holidays, DEQ sent mail notifications on January 6, 2021 as a reminder of the upcoming public briefing on January 7th and start of the public comment period for the draft permit. Subsequent online notifications were also

[6] During the proposed LCS public participation process, the Commonwealth of Virginia was under a continuing state of emergency pursuant to Executive Order 51 and a public health emergency due to the COVID-19 pandemic, including directives and associated restrictions relating to safe assembly and gatherings.

sent. DEQ convened an informational briefing and virtually presented details of the proposed project along with the public participation schedule and the DEQ points of contact for further information. DEQ convened a public hearing on February 8, 2021 where a total 168 individuals were in attendance and 49 registered to speak.

During the notification process, DEQ contacted the Pittsylvania County NAACP ("local chapter") requesting an opportunity to present information on the proposed project to its members. In advance of the meeting, DEQ provided a fact sheet that explained the permit in plain language. On January 5, 2021, DEQ presented details of the draft permit to the local chapter, responded to all questions, and listened to concerns during the meeting which was held via teleconference. The members were invited to contact DEQ and/or attend the forthcoming informational briefing (January 7, 2021). DEQ followed up with the local chapter and reaffirmed its availability to try to answer additional questions or concerns from members.

In addition to the efforts made by DEQ, MVP met the requirements of § 10.1-1307.01 B.1-2, by publishing a notice in the *Chatham Star-Tribune* (including the *Danville Register & Bee*) sixty days prior to the close of the public comment period. The notice was published on January 6, 2021. MVP mailed notifications to: the chief elected official of Chatham, Va., chief administrative officer of Pittsylvania County, and planning district commission for the Pittsylvania County, the Pittsylvania County public library and public schools in Chatham/Pittsylvania County area, and owners of sections of property shown as adjacent to the proposed LCS. MVP engaged a consultant to help develop and implement a coordinated community outreach effort. In compliance with COVID-19 restrictions, this outreach was conducted by telephone, postal mail and email. Through these initial contacts, MVP complied with the regulations by sending notice requirements to landowners, local administrative officers, elected officials, libraries and schools. MVP indicates communications have continued to residents closest to the site, White Oak Community church, the NAACP local chapter as well as maintaining the MVP Southgate website with fact sheets, newsletters, and other information about the project. The proposed compressor station has also been featured on a local African American radio station (WKBY). Since mid-January 2021, MVP has been running a 60 second informational advertisement every two hours. The advertisement describes the project and advises listeners where to find additional information.

The information provided by MVP stated their representative met with the President of NAACP (Pittsylvania County) on March 4, 2021 to discuss the MVP Southgate Project. During a follow-up phone call, Mountain Valley's representative was advised that the Chatham NAACP Environmental Justice Committee was unwilling to meet with MVP to discuss the project and committee members' concerns.

MVP stated that the response rate from residents farther from the proposed facility (3-, 5-, 10-miles or more) has not been as great as those in the immediate vicinity.

Comments stated that DEQ is performing an accelerated review and approval process which was not in keeping with Virginia's 2020 Environmental Justice Act. The permit process needs more public engagement.

DEQ disagrees with the comment suggesting an accelerated review and approval process. 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. The public comment period was 91 days which is longer than the regulatory requirement of 30 days.

Greenhouse Gas/Climate

LCS-10 Comment

Comments asked whether the Virginia Clean Economy Act and the Regional Greenhouse Gas Initiative were considered for the proposed LCS. A reference to a case file for Va. Natural Gas Header Improvement Project (docket PUR-2019-00207) was included with the comments.

Comments said DEQ failed to show consideration of the proposed LCS's GHG emissions, their reasonableness, or their social and economic costs in its evaluation of site suitability.

Commenters provided reference to information related to climate change and diseases.

DEQ Response

The Virginia Clean Economy Act (VCEA) establishes a mandatory renewable portfolio standard program for Virginia's electric utilities, in addition to promoting energy efficiency with a number of specific changes to laws implemented by the State Corporation Commission. The details of implementation of the VCEA and any associated rulemakings are in the development stages. The Regional Greenhouse Gas Initiative (RGGI) is a mandatory market-based program applicable to fossil-fuel-fired electric power generators in the reduction of greenhouse gas emissions. The proposed LCS is not the same source category as an electric power generator.

Some comments suggest that the proposed LCS is "major" for GHG. With respect to major air emissions sources, the United States Supreme Court has determined that the requirements of the Prevention of Significant Deterioration new major source air permit program (PSD program) (9VAC5-80 Article 8) cannot become applicable to an activity solely due to emissions of greenhouse gas (GHG). Pursuant to (9VAC5-85-10, GHGs currently are not

regulated under Virginia's minor new source review program (9VAC5-80 Article 6). Although the proposed LCS GHG emissions do not require a permit, methane emissions during natural gas venting and fugitive leaks, are reduced by approximately 30% in the draft permit by means of the application of BACT to the volatile organic compounds (VOCs) in natural gas. DEQ has no current Article 6 regulatory authority to regulate methane specifically, however reductions in methane will be realized as a co-benefit of DEQ's application of the Regulations for VOC. With respect to any potential future regulation of GHG emissions from minor sources, 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.

Site Suitability

LCS-11 Comment

Comments said the current location is unsuitable. MVP should choose an alternate location where environmental justice impact would be lower. DEQ must consider the provisions of §10.1-1307E of the Virginia Code and 9VAC5-170-170. DEQ did not consider the suitability of placing the proposed LCS in the sited community.

Comments said site suitability should include environmental and community health testing prior to zoning approval.

DEQ 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 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'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. DEQ does not choose the site of a specific project nor is it involved with the restriction or acceptance of land use. DEQ does review the suitability of an activity for the area selected from an air quality perspective. The emissions from the LCS 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.

The engineering analysis considers the specific location of the compressor station and found the site suitable. Issues that include disproportionate impact in the comment are mixing environmental justice (discussed later) with the requirement to determine site suitability. It is important to note 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. Commenters have not identified any more stringent permits for natural gas compressor stations. Comments stating DEQ did not consider the local population are not correct. The air quality analysis considered the impacts of the emissions in the ambient air, where any member of the public may be located, not just the community of Blairs, or Chatham-Blairs. The results of the air quality analysis demonstrated compliance with all applicable air quality standards. Site suitability and DEQ's consideration of related issues (environmental justice) is further discussed in the responses to comments 19-21 and 23. In brief, the cumulative air quality impacts from the proposed LCS are well below the relevant health-based standards and the source-specific air quality impacts from the proposed LCS are beneath any reasonable de minimus level.

Source Type

LCS-12 Comment

Comments said the proposed LCS is a major source of air pollution and cannot be viewed as a minor source.

DEQ 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 LCS is calculated for the applicable programs based on the emissions after the permit and includes fugitive 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. LCS is not a major source.

Other Procedural Comments

LCS-13 Comment

Comments mentioned transparency issue concerning no public agenda for the APCB Public Engagement Committee Public Comment Meeting held on 3/10/21.

Comments said DEQ's acceptance of an application for the proposed LCS is unnecessary when development of the mainline and Southgate Extension projects have delays.

Comments said the two new reports uploaded to the website during the public comment period dismisses transparency and caused insufficient time for public review.

DEQ Response

The Air Pollution Control Board Engagement Committee Meeting that was held on March 10, 2021 is not the subject of this permit action.

The mainline and Southgate Extension projects are not under the purview of this air permit application. The proposed LCS is authorized for construction as governed by the FERC Permit for the facility. DEQ has a complete application and has proceeded with processing the application in accordance with applicable laws and regulations.

MVP submitted two documents and requested to have them posted on the agency's webpage as public comments. In being transparent, the documents were added to the website. DEQ extended the comment period for 30 days.

BACT

LCS-14 Comment

Page 2 of DEQ's Air Permitting Fact Sheet has "Best Achievable Control Technology".

DEQ Response

Page 2 of the fact sheet should read "Best Available Control Technology".

Comments said a top-down BACT approach is required. The regulation does not distinguish a basis for interpreting the definitions according to major and minor sources differently.

DEQ Response

A major source BACT analysis (top-down) is required for any pollutant that exceeds PSD permitting thresholds, and the requirements are set forth in 9VAC5-80-1705 and defined in 9VAC5-80-1615. A minor source BACT analysis is required per 9VAC5-50-260.C and 9VAC5-60-320 for any pollutant that that triggers Article 6 minor new source review (NSR). A BACT analysis ensures that emissions of pollutants triggered for analysis achieve the maximum degree of reduction when taking into account energy, environmental, and economic impacts of achieving the reduction. It is important to note that BACT is an emission limitation, not the application of a technology. This analysis determined that the proposed low/ultralow NOx burners, Selective Catalytic Reduction ("SCR") and Oxidation Catalyst on the turbines would achieve the appropriate BACT limits. 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'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 also did not find compressor stations of any size with the types and number of limits regarding venting events contained in the draft permit.

Comments said BACT determination for the facility should include an alternative energy source (e.g., electric) for PM2.5, NOx and formaldehyde emissions based on infrastructure availability and to ensure lower emissions.

Comment said the law does not prevent DEQ from considering electric compressor turbines as part of BACT review, the doctrine developed to resolve a statutory ambiguity unique to the Clean Air Act's PSD program does not apply to a non-PSD, minor source in a state permitting process.

Comments said MVP needs to consider the long-term cost benefits of using electric turbines.

Comment said the engineering analysis does not correctly characterize BACT.

DEQ Response

BACT means an achievable emissions limitation based on the maximum degree of emission reduction for a pollutant emitted by each affected emissions unit. In 9VAC5-50-240A, the initial applicability sentence states the affected facilities are the "emissions units subject to the new source review program." This regulatory language continues in 9VAC5-50-260B and C to clarify that the BACT emissions limitations are for "any affected emissions units" in the new stationary source or project. Thus, the emissions units under consideration are those proposed emissions units in the application under review by DEQ and it is to those affected emissions units that BACT is applied. The evaluation is to apply BACT to the affected emissions unit, not to consider whether the affected emissions unit can be replaced.

DEQ addresses the basis for alternative considerations in its policy document for minor NSR BACT[7]. According to Chapter 8[8], the wholesale replacement of an emission unit or a fundamental alteration of an emissions unit, such as adding or changing the fuels or raw materials utilized in an emissions unit, is not allowed (based on the text of the regulations described above). This does not mean that DEQ cannot alter parameters of the proposed emission unit. Chapter 8 directs that the determination of how much alteration is allowed

[7] DEQ's Minor New Source Review Manual; Chapter 8 – Control Technology Standards; August 31, 2020 (Chapter 8)
[8] Chapter 8 was revised on August 31, 2020 to clarify DEQ's BACT procedures in response to the BCS decision

before the emissions unit has been fundamentally altered is made utilizing EPA's "redefining the source" doctrine. This includes taking a hard look at the basic business purpose of the project's emissions units, as articulated by the permit applicant. For the proposed LCS, the substitution of electric turbines for natural gas fired turbines fails both reviews. (1) It clearly constitutes the substitution of a different energy source (electricity for natural gas) and therefore is a prohibited wholesale replacement of the proposed emissions unit. (2) Based on DEQ's analysis of the basic business purpose of the emissions unit, it would also constitute a redefinition of the source. DEQ reached this determination after careful review of the MVP's documentation[9] that its stated business purpose is the reliable, timely supply of natural gas to its customers, and that this purpose would be adversely impacted by a switch from natural gas to relatively unreliable utility electrical power. This is particularly true given the case-specific circumstances of this project with respect to the inherent fuel source[10] (natural gas from the pipeline) and the lack of existing electrical infrastructure[11]. Therefore, DEQ has determined that the 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) is not a control technology to be considered in Virginia's minor NSR BACT determination for the proposed LCS. This determination and the underlying guidance on which it is based (Chapter 8) fully conforms with DEQ's regulations, the fundamental concepts of BACT established by Chapter B of EPA's 1990 draft NSR manual and the BCS decision.

Even if the substitution of electric turbines for the proposed natural gas turbines was considered a control technology, which it is not, MVP's application information regarding the lack of existing electrical infrastructure, the timing of constructing such infrastructure and the uncertainty inherent to constructing such infrastructure demonstrates that the "technology" is unavailable for this project in this location at this time. The fact that electric turbines have been proposed and used at other compressor stations, with access to sufficient electrical infrastructure, does not mean they are available at all locations, and in particular, at locations without the requisite infrastructure.

Some commenters also supplied information regarding the average cost-effectiveness analysis for electric turbines that was included in MVP's application. MVP developed their analysis to address a scenario where electric turbines might, contrary to DEQ's determinations, be considered an available control technology for the control of emissions from proposed LCS. MVP's analysis demonstrated that the average cost-effectiveness of replacing the combustion turbines with electric turbines was well beyond the point which could be reasonably considered economically feasible. While DEQ did not rely on any cost consideration in regard

[9] MVP June 2020 Application Section 5.5
[10] United States Court of Appeals for the Fourth Circuit No. 1152 Friends of Buckingham (BCS) page 9 and Helping Hands Tools v. U.S. EPA, 848 F.3d at 1195
[11] MVP June 2020 Application Sections 5.5 and 5.6

to this issue as noted above, DEQ notes that the analysis supplied by the commenters showing a lower cost-effectiveness inappropriately excludes some costs associated with the use of electric turbines. Even with these costs excluded, the cost effectiveness value calculated by the comment (+$14,000/ton) is beyond the range DEQ considers economically feasible for this project.

DEQ's review of permits for this industry type has determined that the BACT limits for NOx, PM2.5, and formaldehyde in the draft permit are the most stringent limits for natural gas compression turbines. As noted, DEQ does not substitute alternative equipment for the affected emission units as part of the BACT review. The draft permit's BACT determination for NOx, PM2.5 and formaldehyde remains unchanged.

Comments said the BACT concentration for NOx concentration should be lower.

DEQ Response

As addressed in the engineering analysis, the proposed LCS does not trigger BACT for NOx emissions. The suggestion for a lower BACT concentration for NOx cites various power production facilities as examples to establish the basis for a NOx concentration of 2.5 ppmvd and 2.0 ppmvd. The final sentence in the definition of BACT (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 facilities are not the same industry; and the comparison proposed is not appropriate.[12] See modeling section on the response to 1-hr NO_2 NAAQS.

Comments said the proposed LCS NOx emissions are not exempt from BACT.

DEQ Response

SoLoNOx is the turbine burner technology designed to optimize the combustion chamber air/fuel mixing process. The burner has the benefit of improved efficiency however, unlike add-on control devices, it cannot be bypassed or removed without leaving the turbine inoperable. For this reason, the SoLoNOx burners cannot be viewed as an add-on control

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

device. It is vital for the turbine's operation and therefore the estimated uncontrolled NOx emissions remain unchanged.

Specific Comments on the Draft Permit

LCS-15 Comment

1. *DEQ does not have adequate information to satisfactorily determine if permit issuance would comply with Virginia law, negatively impact the public health, or pollute the air, soil, or water.*

   DEQ Response
   As indicated in DEQ's engineering analysis if the proposed LCS is constructed and operated in accordance with the conditions of the draft permit, it will comply with all applicable air quality regulations.

   As stated earlier, the Regulations for the Control and Abatement of Air Pollution prescribe the requirements that a source must comply with to obtain an Article 6 (minor NSR) permit. In reviewing the application for this 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), and Virginia's own health-based standards for toxic pollutants. DEQ's review of the initial application and subsequent updates demonstrate that the proposed LCS will apply the Best Available Control Technology (BACT) for each applicable pollutant.

2. *Outdated AP-42 emission factors were used to determine fugitive emissions.*

   DEQ Response
   Usage of AP-42 emission factors may be applied in lieu of site-specific information or vendor supplied information for the specific equipment purchased. Emission factors are revised once site specific data (stack testing) is generated. However, in this case the engineering analysis was revised since the source calculations were based on factors from 40 CFR 98 Table W-1A (see Appendix B of source application).

3. *The permit record lacks a guarantee that the Department's claims formed the basis for calculating LCS emissions.*

   DEQ 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 LCS without regard to equipment 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.

4. *The permitting record does not support the draft permit's description of startup, shutdown, and normal operations.*

DEQ 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 have been considered. 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.

5. *The provisions for oxidation catalyst operations are unclear.*

DEQ Response

The comment does not identify an error in the value. The minimum temperature for operation contained in Condition 4(c) 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 4, 20, and 21. Combustion gases will always pass through the catalyst, achieving whatever efficiency may be achieved at optimal temperatures. The comment did not identify, nor has DEQ found, any compressor station with more stringent limits.

6. *Ammonia emissions (from the SCR) is not included in the draft permit.*

DEQ Response

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

7. *Biennial performance testing can only be enforced as a practical matter with CEMS for CO, VOC, and filterable PM to ensure compliance.*

DEQ Response

While CEMS are one way of determining compliance with emission limitations; they are not required for lower emitting units. The draft permit does not require CEMS for these pollutants as it contains numerous monitoring requirements related to the operation of the turbines. The monitoring requirements are to continuously monitor and record various process parameters associated with the turbines and respective SCR. Conditions 8, 9, 10, 13 delineate these requirements. The values of these parameters are determined during the stack testing required in Conditions 30 and 31. These values are re-evaluated and adjusted if necessary during the bi-annual testing or at any time emissions testing is requested.

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, LCS will demonstrate continuous compliance with the emission limits in the permits.

8. *The draft permit fails to ensure continuous compliance with formaldehyde limits.*

DEQ Response

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

9. *The draft permit incorrectly labels equipment specifications as being for informational purposes.*

DEQ 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.

10. Permit terminology is vague and not enforceable.

DEQ Response

These terms are usually the same terms used in the Regulations and will be specific to each emissions unit (not just emission unit type), particular operating situation, and manufacturer recommendations. Importantly, the numeric emission limits in the permit must be met regardless of the terms used in the condition. Performance tests demonstrating compliance with the emissions limitations in the permit are also required, and the compliant operating ranges for the control device and process monitoring parameters will be identified during those tests. Broader language in the permit conditions allows DEQ to require that the procedures update as best practices improve over time. The terms in these conditions also facilitate inspections because the inspector can check what the facility is doing against the manufacturer data of current best practices. DEQ may ensure the unit is not only operating as it was during the performance test but potentially reduce emissions beyond present limits through future improvements to best practices.

11. The PTE for HAPs in Table 3 of the draft engineering analysis lists the uncontrolled emission rate while the PTE for the other pollutants are the controlled emission rates. The HAP controlled emission rate is 1.09 tpy.

DEQ Response

The change is accepted. The HAP controlled emission rate (1.09 ton/yr) was verified as stated in the referenced application. The draft Engineering Analysis is corrected. No correction required for the draft permit.

12. The draft permit does not address condensable particulate matter emissions.

DEQ Response

The draft permit particulate matter emissions limits are based on total PM which includes both filterable and condensable particulate matter. No change is required in response to this comment.

13. An explanation is needed for the basis on venting (blowdown) requirement.

DEQ 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 LCS draft permit conditions by using the term 'venting event.' For the purpose of the draft permit for LCS,

only three venting events are allowed: those due to maintenance on a turbine when a turbine is shutdown (12 startup and 12 shutdown for each turbine); pig launching and receiving (2 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 12 of those may vent natural gas.

14. *The requirement for pigging-related emissions is inconsistent with anticipated operations.*

DEQ Response

Pigging operations are expected to occur during normal inspection and equipment maintenance operations. While this operation may be infrequent, the potential demand for unexpected inspections or maintenance operation are quantified and limited in the draft permit. Compliance with pig launching and recovery is demonstrated based on the conditions 6(c) and 24 in the draft permit.

15. *Proper fugitive emissions monitoring should be monthly optical gas imaging surveys.*

DEQ Response

Daily AVO and quarterly LDAR surveys are BACT and appear to represent the most stringent requirements for natural gas compressor stations in Virginia and the country. The NSPS only requires quarterly leak detection and repair (LDAR) surveys. The BACT determination for fugitive leak components remains unchanged.

16. *The draft permit doesn't have adequate measures for determining compliance with the fuel sulfur content limit.*

DEQ Response

The draft permit succinctly states the permittee will monitor the sulfur content of the "as-received" natural gas using a valid purchase record. As an alternate, the permittee may select to have a sulfur content fuel analysis of the natural gas once delivered. The details of what test to perform for this analysis is authorized by the regional office. Having a valid shipping record or results from an approved test method is sufficient to demonstrate compliance with sulfur content limitation established in the permit. This permit condition remains unchanged.

17. *The permit does not ensure hexane emissions are exempt from permitting. The draft permit should be amended once this is confirmed.*

DEQ Response

MVP acknowledged the hexane concentration in the application was different from that used in MVP Mainline assessment. Revised data was provided to calculate the emission rate of hexane. The data includes a combination of natural gas analyses from various stations serving nearby wellfields that would most represent what is expected to flow through the proposed LCS. Also, DEQ utilized information from the engineering expertise of MVP to estimate pressure loss experienced when pushing the pig through a pipe. Conservatively, MVP increased the hexane content of the representative gas analyses by a factor of 100%. These assumptions are in the draft permit and are enforceable via emission limits for hexane from the various venting events. The draft permit requires LCS to calculate emissions and maintain supporting documentation for those calculations, which can be reviewed by DEQ to ensure compliance. The permit condition remains unchanged.

18. *A continuous opacity monitoring system (COMS) system ensures that opacity limits are met continually.*

DEQ Response

COMS are one way of determining compliance with emission limitations; however, they are not required for lower emitting units. Although the draft permit does not require COMS, it contains monitoring requirements related to the operation of the turbines and the respective SCR. 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 30 and 31. These values are re-evaluated and adjusted if necessary during the bi-annual testing or at any time emissions testing is requested.

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, LCS will demonstrate continuous compliance with the emission limits in the permits. The permit condition remains unchanged.

19. *The initial performance test should include SO_2 and NOx emissions.*

DEQ Response

Condition 15, in defining the fuel allowed at the site, limits the potential available sulfur that could be converted into SO_2 emissions from combustion of the gas. Conditions 16 and 40 require testing and records of the sulfur content. As described in the draft engineering analysis, the uncontrolled SO_2 emissions from the entire facility are 5.37 tons per year, which is less than the exemption rate of 40 tons per year contained in 9VAC5-80-1105C. The proposed LCS SO_2 emissions are not subject to Article 6 permitting or BACT. Emissions testing from each turbine is not required for these reasons. NOx was inadvertently omitted. Permit Condition 30 has been changed.

20. *The draft permit does not state how missing or invalid CEMS data will be considered for compliance determinations.*

DEQ Response

The draft permit requires recordkeeping of other parametric monitoring data to verify the proper operation of the turbines and respective SCR. Such data may be used as a substitute during periods of missing or invalid CEMS data (for NOx). Instances of CEMS downtime are also identified during CEMS reporting.

21. *Reports required by the permit should be released to the public.*

DEQ Response

Public records, including a monitoring plan, are available from DEQ pursuant to the provisions of the Freedom of Information Act or FOIA.

22. *Regarding Condition 4, the expectations for "good" air pollution control practices is not what is needed for people living in the impacted community.*

DEQ Response

The regulatory operating terminology is explained in item 10 of this section.

23. *Regarding condition 4e, emission controls address minimizing emissions during start-up or shutdown using either the manufacturer's written protocol or undefined "best engineering practice", leaving it up the operator to document and explain the sufficiency of these practices." This should have well-defined protocols, parameters, and oversight by appropriate government agencies.*

DEQ Response

The introduction to Condition 4 replicates the regulatory 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.

24. *Regarding condition 6c, the limitation suggests pig operations must result in significant emissions. There is no mention of potential radioactivity associated with use of this equipment.*

DEQ Response

Condition 6c identifies the process limitations during pig launching and recovery based on LCS proposed operations. The limitations are necessary for accounting of the facility's inventory of VOC emissions (see footnote on permit condition 24). See response to comment LCS-6 for discussion on radiation.

25. *Regarding condition 6f, there is no mention of DEQ monitoring these events or establishing a maximum duration for each of them especially for people living close to the compressor station. Sufficient forewarning to the residents would allow the medically vulnerable people and those with infants and/or children to close up their dwellings or plan to be away from the area during that time.*

DEQ Response

Condition 6f identifies the process limitations during turbine venting based on LCS operations. Such limitations are necessary for accounting the facility's inventory of VOC emissions (see permit condition 24). DEQ's review of the application and the resulting draft permit comply with all applicable health-based ambient air quality standards designed to protect public health and the environment, 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. The permit condition remains unchanged.

26. *Regarding condition 7, emission controls addresses work practices to reduce emissions from leaks of gas from the facility. There are multiple inadequacies in this section which is a critical piece in protecting the health of the surrounding public.*

DEQ Response

The comments did not identify any specific items by this statement, specific aspects of condition 7 are described in the responses to comments 27 and 28 below.

27. *Regarding condition 7a, the draft permit states that fugitive leaks below 500 parts per million are not considered leaks. This is unacceptable.*

DEQ Response

LCS is subject to the federal standard for Crude oil and Natural Gas Facilities who commenced construction after September 18, 2015, or NSPS OOOOa (40 CFR 60 Subpart OOOOa). The rule establishes an instrument reading of 500 ppm or greater as an exception to equipment leak standard. The permit condition remains unchanged.

28. *Regarding condition 7a, the responsibility is on the permittee, suggests there are no established standards and "best practice" requirements for this vital part of compressor station operation.*

DEQ Response

Condition 7, and its subsections are based on the performance standard for natural gas facilities constructed after September 18, 20015 (40 CFR 60 Subpart OOOOa). These standards are considered best practice requirements.

a. *Regarding condition 7c, the more extensive leak detection survey is only scheduled quarterly and the 60 days grace period for the initial extensive survey allows for a time in which the surrounding area and compressor station employees could be exposed to harmful emissions.*

DEQ Response

The draft permit requires daily AVO and quarterly LDAR surveys. The interval required before the initial LDAR survey is reflective of the timeframe in the Federal NSPS and is appropriate. It takes time for a new facility to initially come online and 60 days is the amount of time allowed by the standard. DEQ has reviewed other permits and requirements for natural gas compressor stations and has not found requirements for more frequent LDAR surveys. In fact, DEQ's review indicated sources have only been required to do quarterly LDAR surveys to the extent any conditions are required. No change is made to this condition.

b. *The daily AVO (auditory/visual/olfactory) inspection program relies on a functioning olfactory system in the employee doing the monitoring. Some in the general population have diminished sense of smell including those who have or had COVID 19 infection.*

DEQ Response

The operational choices by sources such as an employee's olfactory ability does not excuse compliance with permit requirements. These are completed by personnel and cannot be executed remotely. Also see response to item #28.c below. The permit condition remains unchanged.

c. *The natural gas to be transmitted by the pipeline will contain no odorant and will be odorless and colorless. The daily AVO inspection program will only involve listening for leaks. For two out of seven days, there is no mandatory monitoring.*

DEQ Response

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. Daily AVO and quarterly LDAR surveys are BACT and appear to represent the most stringent requirements for natural gas compressor stations. The permit condition remains unchanged.

d. *The possibility for COVID spread in association with construction projects should put an indefinite hold on the proposed LCS construction, even if a permit is issued.*

DEQ Response

Regulation of the spread of disease during a project's construction is beyond the purview of the Regulations for the Control and Abatement of Air Pollution that is the authority for this draft permit.

29. *Regarding condition 19, each microturbine has an emission limit of 0.02 lb/hr for VOCs which would amount to 175 lb/year (8760 x 0.02 = 175.2). When multiplied by the five microturbines the total amount could reach 876 lb/year which is more than the Solar Mars 100 turbine listed in Condition 20. There needs to be an annual emissions limit for VOCs for the microturbines.*

DEQ Response

The combined annual VOC emission limit for the five microturbines is 0.438 ton/yr ($\frac{876\ lb/yr}{2000\ lb/ton}$), this value is less than 0.5 ton/yr minimum reporting limit. Criteria pollutants

with controlled emissions less than 0.5 ton/yr generally are not listed in the permit. LCS is still required to maintain records of calculated pollutant emissions.

30. *Regarding condition 20, the annual emissions limit for carbon monoxide is essentially 58% more than allowed by the hourly emissions limit (8760 x 0.60 = 5,256 lb). The emissions limit of 6.30 tpy (12,600 lb) needs to be significantly less than listed in the draft permit. It needs to be closer to 2.63 tpy (5,256 lb) to be a meaningful limit.*

DEQ Response
The annual emission limit of 6.3 ton/yr for carbon monoxide must also account for emissions during startup and shutdown (3.33 tpy) and low temperature (0.37 tpy) operations.

31. *Regarding condition 20, the annual emissions limit for VOCs is essentially 37% more than allowed by the hourly emissions limit (8760 x 0.09 = 788.4 lb). The emissions limit of 0.63 tpy (1,260 lb) needs to be less than listed in the draft permit. It needs to be closer to 0.39 tpy (788.4 lb) to be a meaningful limit.*

DEQ Response
The annual emission limit of 0.63 ton/yr for VOC must also account for emissions during startup and shutdown (0.23 tpy) and low temperature (0.02 tpy) operations.

32. *Regarding condition 21, the annual emissions limit for carbon monoxide is essentially 69% more than allowed by the hourly emissions limit (8760 x 0.41 = 3,591.6 lb). The emissions limit of 5.93 tpy (11,860 lb) needs to be significantly less than listed in the draft permit. It needs to be closer to 1.80 tpy (3,591.6 lb) to be a meaningful limit.*

DEQ Response
The annual emission limit of 5.93 ton/yr for carbon monoxide also accounts for emissions during startup and shutdown (3.90 tpy) and low temperature (0.25 tpy) operations.

33. *Regarding condition 21, the annual emissions limit for VOCs is essentially 72% more than allowed by the hourly emissions limit (8760 x 0.06 = 525.6 lb). The emissions limit of 0.94 tpy (1,880 lb) needs to be significantly less than listed in the draft permit. It needs to be closer to 0.26 tpy (525.6 lb) to be a meaningful limit.*

DEQ Response
The annual emission limit of 0.94 ton/yr for VOC must also account for emissions during startup and shutdown (0.23 tpy) and low temperature (0.02 tpy) operations.

34. *Regarding conditions 19, 20, and 21, other pollutants (NOx, PM, SO2) are within 0.5 to 5% of each other when comparing hourly and annual emissions. The CO and VOC comparisons for hourly and annual emissions mentioned above aren't close.*

DEQ Response

The annual emissions for NOx, PM, and SO2 also accounts for emissions during startup, shutdown and low temperature operations. However, these emissions increase are significantly less.

Environmental Justice (EJ)

LCS-16 Comment

Some commenters requested cumulative risk assessments and cumulative health impacts analyses.

DEQ Response

The State Air Pollution Control Law and implementing regulations do not provide authority to require applicants conduct a cumulative risk or health assessment as part of the application for a minor new source review permit (or any air permit).

The Federal Clean Air Act requires that the U.S. Environmental Protection Agency (EPA) establish and update National Ambient Air Quality Standards (NAAQS) designed to protect human health and welfare. DEQ developed the draft permit for the proposed LCS to ensure compliance with these health based standards. Risk was addressed by requiring the applicant to demonstrate compliance with both acute (short-term) and chronic (annual) air quality standards. The NAAQS are based on air quality criteria 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. Additional information on EPA's process for reviewing the NAAQS is available at https://www.epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards.

Air quality in the area and Virginia as a whole has been steadily improving over the last twenty years. Many factors have gone into those improvements, including DEQ's implementation of the new source review permit program requiring strict emissions limitations pursuant to the Best Available Control Technology (BACT) standard. The following table describes the great improvement achieved in the south central Virginia air quality since the early 2000s. Virginia continues to work to reduce pollution through additional activities such as the VW Settlement fund, implementing carbon trading through the Regional Greenhouse Gas Initiative (RGGI) required in the Clean Energy and Community Flood Preparedness Act, the Virginia Clean Economy Act, and proper implementation of the air pollution control regulations.

Pollutant	Averaging Time	2005	2014	2019
PM2.5 ($\mu g/m^3$)[13,14]	24-hour	33	18	14
PM2.5 ($\mu g/m^3$)	annual	13	8.3	6.4
Ozone (ppb)	8-hour average	74	62	59
NO_2 (ppb)[15,16]	1-hour average	46	37	32
SO_2 (ppb)[17]	1-hour average	16	5	3
ppb = parts per billion $\mu g/m^3$ = micrograms per cubic meter				

[13] PM2.5 data is from closest DEQ monitor with sufficient historic data; located in Lynchburg, VA. The data for the other pollutants is from the closest DEQ monitor in Roanoke, Virginia.
[14] PM2.5 is particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
[15] Nitrogen Dioxide
[16] As described below, the initial ambient monitoring data from the recently commissioned NO2 monitor located at the Transco compressor station indicate even lower concentrations: 22 ppb
[17] Sulfur Dioxide

More specifically to Pittsylvania County, county-wide actual NOx (Nitrogen Oxides) and Volatile Organic Compound (VOC) emissions declined by over 900 tons/yr and 150 tons/yr, respectively, from 2010 to 2019. The recent (2019) permit issued by DEQ to the adjacent Transco compressor station will result in additional reductions in NOx potential emissions of at least 3,000 tons/yr. Recent and future expected national and state-wide NOx emission reductions (see NOx emission chart attached) are expected to further reduce background ozone and NO_2 ambient air concentrations. In summary, the air quality in Pittsylvania County (including the site of the proposed LCS) has been improving, is currently good and is expected to continue to improve.

MVP voluntarily provided a public health assessment[18] of the proposed LCS's emissions. This assessment indicates the proposed LCS's emissions will have no effect on residents in the area and will not exacerbate any current impacts in the area.

With regard to the NAAQs, as further discussed in the responses to comment 19-21, DEQ's consideration of the air quality impacts from the proposed LCS was both comprehensive (cumulative and source-specific, individual property and EJ-community basis, worst-case parameters and operating conditions, the particular applicability of the NAAQS) and detailed.

LCS-17 Comment

Some comments indicate that the Board (and DEQ) cannot rely on the Pipeline's conclusory and unsupported Health Assessment. The comment indicates that the Assessment is flawed because of its "reliance on compliance with the NAAQS" and because it lacks "any, much less scientific, support."

DEQ Response

The comments appear to refer to the Green Health Report described in footnote 18. No authority has been cited for the proposition to limit the information in the record that DEQ or the Board may consider. Contrary to the comment's claim, the Green Health Report does include multiple citations. The comment also states that the Green Health Report's consideration of the impact of SO_2 and NO_2 on asthma symptoms is contradicted by the evidence[19] provided by the commenter. However, the information provided does not address the Green Health Report's discussion of asthma symptoms.

---

[18] "Public Health Assessment of Expected Airborne Emissions from the Proposed Lambert Compressor Station Pittsylvania County, Virginia" by Laura C. Green Ph.D., D.A.B.T. and Edmund Crouch, Ph.D. February 25, 2021 (Green Health Report)

[19] Report of George Thurston, Sc.D. Chester, NY 10918 April 9, 2021

With regard to the NAAQs, as further discussed in the responses to comments 19-21, DEQ's consideration of the air quality impacts from the proposed LCS was both comprehensive (cumulative and source-specific, individual property and EJ-community basis, worst-case parameters and operating conditions, the particular applicability of the NAAQS) and detailed.

LCS-18 Comment

Some commenters request that DEQ evaluate cumulative and combined past and future effects of Transco and MVP compressor stations. Some comments state the LCS will increase PM2.5 pollution in the area by 30%.

DEQ Response

DEQ has included the air quality impacts from the Transco compressor station in its air quality analysis (including toxic pollutants) of the proposed LCS. The maximum increase in the PM2.5 ambient air concentration from the proposed LCS is 3.6% (DEQ Air Quality Analysis Memo; 0.79 $\mu g/m^3$ / 22 $\mu g/m^3$). The maximum concentration for all pollutants emitted by the proposed LCS occur on MVP or Transco compressor station property. As described below, the ambient air impacts from the proposed LCS are even lower beyond these properties.

LCS-19 Comment

Some commenters indicate DEQ has improperly used EJSCREEN. Some commenters also indicate that DEQ and/or MVP misrepresented the findings of EJ assessment/report conducted by Dr. Lawrence which was submitted by MVP. Some commenters also noted differences between the Lawrence EJ report and the MPV EJ report (1-mile vs. 3-10 miles; four EJ communities vs. one EJ community). Some commenters indicated that DEQ should use census block groups instead of census tracts to identify EJ communities to provide for a more detailed analysis. Some commenters indicate that DEQ must identify EJ communities to comply with requirements of the Virginia Environmental Justice Act (VEJA) and the BCS decision. One commenter suggested that DEQ's EJSCREEN reports were not accurate relative the location of the proposed LCS.

DEQ Response

From DEQ's draft engineering analysis: "To help identify potential impacts on minority and low-income populations, the applicant used both desk-top information, such as census data obtained from the Environmental Protection Agency's environmental justice screening and mapping tool, "EJSCREEN" and field studies to confirm the results. The applicant's review concludes that a low-income community exists within the 1-mile radius, and the potential exists for a community of color within a very small area at the edge of the 1-mile radius." In

the draft engineering analysis, DEQ agreed that the proposed LCS is located in an EJ community and, as described below, hereby confirms that position. DEQ utilized the clear results from EJSCREEN and the Lawrence EJ report to determine that the area is an EJ community and proceeded accordingly. Commenters appear to state the community around the proposed LCS is an EJ community: DEQ agrees.

As supplements to its air permit application for the proposed LCS, MVP submitted two EJ-related documents. One document is titled "Supplemental Information on Environmental Justice" and is dated September 2020. This document[20], according to MVP, "demonstrates compliance with EJ requirements and principles, and it provides information to make the necessary findings under Va. Code 10.1-1307E and VEJA". The second document is titled "Community Impact Assessment of Lambert Compressor Station", and it was prepared on MVP's behalf by Dr. Alexa Sutton Lawrence, Ph.D.[21] The Lawrence EJ Report was originally dated September 2020, and an updated version was dated February 25, 2021. The MVP EJ Report describes the Lawrence EJ Report as "a far-reaching analysis of EJ principles, and she has expanded on the community outreach that MVP has conducted and is continuing to conduct." It further notes, "For instance, Dr. Lawrence did not limit herself to actual impacts from the Station, but also perceived impacts of the Station, the Project as a whole, and pipelines generally at distances out to 30 miles from the Station." Commenters fault MVP's own 1-mile EJ impact assessment as being overly narrow compared to the broader area (3-10 miles) studied by Dr. Lawrence. The basis for this distinction is Dr. Lawrence's stated purpose to "identify any EJ communities present at a broader scale, extending our review to connected communities even beyond the points of expected direct impact. MVP agreed to assess impacts at this distance, not because they affirm the expectation of direct impacts at this range, but rather because we sought to (1) avoid missing environmental justice communities based on any preconceived notions of where impacts occur; and to (2) identify and facilitate early engagement…" and the Lawrence EJ Report's corresponding use of census tracts as community boundaries versus the MVP' EJ Report's focus on the greatest air quality impacts of the station and its use of census block groups as community boundaries (in accordance with VEJA).

Regarding census tracts and census block groups, census tracts are small, relatively permanent statistical subdivisions of a county or equivalent entity that are updated by local participants prior to each decennial census. The primary purpose of census tracts is to provide a stable set of geographic units for the presentation of statistical data. Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people. A

[20] For the purpose of this response to comment document (RTC), referred to henceforth as "MVP EJ report"
[21] Henceforth in this RTC document: "Lawrence EJ Report"

census tract usually covers a contiguous area; however, the spatial size of census tracts varies widely depending on the density of settlement. Census block groups are statistical divisions of census tracts, are generally defined to contain between 600 and 3,000 people, and are used to present data and control block numbering. A census block group consists of clusters of blocks within the same census tract that have the same first digit of their four-digit census block number. A census block group usually covers a contiguous area.

With this understanding, there is no true conflict between the documents. It should be noted that while these documents informed DEQ's analysis, DEQ's determinations are its own and DEQ has determined that the proposed LCS is located in an EJ community. As described in Table 1 below, based on the most recent EJSCREEN update (January 2021), there are other EJ communities in the vicinity of the proposed project. However, the greatest impacts from the proposed LCS will occur in the community where the station is located, census block group 105-001[22]. The VEJA specifically directs the use of census block groups to define/evaluate low-income communities. While the VEJA definition of community of color does not include the same census block group specification, DEQ believes it is reasonable to also use census block groups for this purpose, (distinguishing "geographically distinct areas" under the community of color definition) for this project. DEQ used the Pittsylvania County GIS website (Table 3) to examine whether there were any geographically distinct EJ "pocket" communities within census block group 105-001 close to the proposed LCS. No such communities were noted, and there were no comments that indicated any additional EJ communities impacted by the station.

Table 1: Environmental Justice Communities in Proximity to the Proposed LCS

Census Block Group #	Distance to MVP at closest point	People of Color Population (%) / State Average	African-American Population (%) / State Average	People of Color Population is Primarily African-American	Low-Income Population (%) / State Average	Total Population	Environmental Justice Community[1]
105-001	0 miles (LCS)	35/38	32/19	Yes – 91%	19/25	1,152	Yes
105-002	2.2 miles (Chatham)	35/38	28/19	Yes – 80%	34/25	1,770	Yes
105-003	3.2 miles	49/38	43/19	Yes – 88%	53/25	1,948	Yes
106-001	7.0 miles	48/38	38/19	Yes – 79%	55/25	1,184	Yes

[22] All the census block groups discussed in this document include the numeric identification prefix "511430" in their designations, but the prefix has been truncated in order to clarify the discussion.

106-002	2.6 miles	25/38	21/19	Yes – 84%	41/25	1,786	Yes
107-001	1.0 miles	62/38	55/19	Yes – 89%	42/25	668	Yes
107-002	1.2 miles	38/38	30/19	Yes – 79%	34/25	935	Yes
109-001	1.2 miles	6/38	3/19	No – 50%	27/25	1,179	No
109-002	4.3 miles	14/38	8/19	No – 57%	38/25	1,464	Yes

To document DEQ's position that the EJ communities located greater than 1-mile from the station are impacted even less than census block group 105-001 (location of the proposed LCS), DEQ analyzed the primary pollutants of concern for these communities out to a distance of 3 miles. The results (Table 2) demonstrate that the communities are impacted even less than census block group 105-001. DEQ also examined the air quality impacts from the proposed LCS at distances greater than 1-mile within census block group 105-001. These impacts were even smaller than those described in Table 3.

Table 2: Ambient Air Impacts from LCS on Adjacent Environmental Justice communities

Census Block Group #	Distance to LCS turbine stacks at closest point	Maximum PM2.5 Annual concentration ($\mu g/m^3$)	Maximum PM2.5 24-hour concentration ($\mu g/m^3$)	Maximum NO_2 1-hour concentration ($\mu g/m^3$)
105-001	Proposed LCS[23]	0.14	0.79	17.48
105-002	2.2 miles – (Chatham)	0.002	0.02	0.81
106-002	2.6 miles	0.009	0.04	0.89
107-001	1.0 miles	0.014	0.09	1.36
107-002	1.2 miles	0.014	0.06	1.36
109-001	1.2 miles	0.014	0.09	1.36

Table 3: Inventory of Property within 1-mile of the proposed LCS – Pittsylvania County GIS Site

Parcel ID	Street Number	Owner	Residence	Acreage	Distance to LCS (turbine stacks)	Maximum Annual LCS PM2.5 Concentration % of NAAQS
Properties generally south of the proposed LCS						
2436-80-3032	N/A	Kessler	No	180	0.2 miles	0.6%

[23] These maximum values occur on MVP property.

Table 3: Inventory of Property within 1-mile of the proposed LCS – Pittsylvania County GIS Site						
Parcel ID	Street Number	Owner	Residence	Acreage	Distance to LCS (turbine stacks)	Maximum Annual LCS PM2.5 Concentration % of NAAQS
2435-49-7240	272	Shorter	No	70	0.3 miles	0.17%
2435-48-1997	220	Shorter	Yes	1	0.6 miles	0.08%
2435-39-3788	406	Adkins	Yes	71	0.3 miles 0.6 miles - r	0.17% 0.08%
2435-47-5900	4249	Doolin	Yes	1	0.8 miles	0.08%
2435-37-9732	4117	Adams	Yes	12	0.9 miles	0.08%
2435-28-9138	2458	Morton	Yes	3	0.9 miles	0.08%
2435-38-0701	4117	Adams	No	10	0.8 miles	0.08%
2435-27-0254	2530	Lowe	No	67	0.9 miles	0.08%
2445-18-9487; 2435-87-9796	400	Whitehead	Yes	619	0.7 miles	0.08%
2435-87-2551	N/A	Marsh	No	31	0.7 miles	0.08%
2435-99-0777; 2435-89-9100; 2436-90-7053	3821	Betterton	Yes	20	0.6 miles	0.08%
2435-77-4358	3340	Maxey Properties	No	28	0.7 miles	0.08%
2435-57-7174	3240	Maxey Properties	Yes	107	0.7 miles	0.08%
2435-38-1783	395	Garner	Yes	26	0.7 miles	0.08%
Properties generally west of proposed LCS						
2436-42-6652	N/A	Jones	No	51	0.3 miles	0.08%
2436-21-9771	740	Robertson	Yes	113	0.4 miles	0.08%
2436-33-8948	1565	Shelton	Yes	79	0.5 miles	0.08%

Table 3: Inventory of Property within 1-mile of the proposed LCS – Pittsylvania County GIS Site						
Parcel ID	Street Number	Owner	Residence	Acreage	Distance to LCS (turbine stacks)	Maximum Annual LCS PM2.5 Concentration % of NAAQS
2436-43-6161	N/A	Jones	No	6	0.4 miles	0.08%
2436-54-3770	N/A	Jones	No	14	0.5 miles	0.08%
2436-44-7363	1551	Jones	Yes	11	0.5 miles	0.08%
2435-28-4733	2441	Lowe	Yes	8	0.9 miles	0.08%
2435-29-2182	587	Trembley	Yes	2	0.9 miles	0.08%
2435-29-0211	689	Meadows	Yes	2	0.9 miles	0.08%
2435-19-8376	N/A	Meadows	No	1	0.9 miles	0.08%
2435-19-7466	739	Kronkowski	Yes	1	0.9 miles	0.08%
2435-19-6574	769	Haymore	Yes	1	0.9 miles	0.08%
2435-19-5683	N/A	Haymore	No	1	0.9 miles	0.08%
2435-29-6519	640	Blair	Yes	8	0.8 miles	0.08%
2436-20-1215	614	Blair	Yes	22	0.8 miles	0.08%
2435-19-9691	700	Atkins	Yes	1	0.9 miles	0.08%
2435-19-8756	748	McCallister	Yes	1	0.9 miles	0.08%
2436-10-6122	792	Keatts	Yes	5	0.9 miles	0.08%
2436-10-3292	892	Adkins	Yes	2	0.9 miles	0.08%
2436-10-2356	N/A	Adkins	Yes	2	0.9 miles	0.08%
2436-10-2962	N/A	Robertson	No	18	0.9 miles	0.08%
2436-11-6161	520	Davis	Yes	1	0.9 miles	0.08%
2436-11-6246	516	Davis	Yes	1	0.9 miles	0.08%
2436-11-3421	461	Gibson	Yes	1	0.9 miles	0.08%

Table 3: Inventory of Property within 1-mile of the proposed LCS – Pittsylvania County GIS Site						
Parcel ID	Street Number	Owner	Residence	Acreage	Distance to LCS (turbine stacks)	Maximum Annual LCS PM2.5 Concentration % of NAAQS
2436-11-4454	N/A	Robertson	No	1	0.9 miles	0.08%
2436-11-6415	505	Robertson	Yes	1	0.9 miles	0.08%
2436-01-7778	421	Slaughter	Yes	11	0.9 miles	0.08%
2436-03-5489	1912	Stump	Yes	177	0.9 miles	0.08%
2436-23-2861	N/A	Post	No	21	0.8 miles	0.08%
2436-35-2395	N/A	East	No	107	0.8 miles	0.08%
Properties generally north of the proposed LCS						
2436-73-3459; 2436-72-5208	945	Transco	No	140	0.1 miles	1.0%
2436-83-7383	N/A	Newcomb	No	1	0.5 miles	0.25%
2436-55-5451	N/A	Shelton	No	12	0.7 miles	0.08%
2436-55-7983	1661	Minter	Yes	2	0.8 miles	0.08%
2436-55-1235	1561	Shelton	No	0.4	0.7 miles	0.08%
2436-75-1295	N/A	Brown	No	32	0.5 miles	0.25%
2436-95-5098	N/A	Brewbaker	No	147	0.5 miles	0.33%
2446-03-4804	766	Evans	Yes	70	0.6 miles	0.17%
2436-93-6179	696	Younger	Yes	1	0.6 miles	0.17%
2446-03-0015	600	Montgomery	Yes	2	0.7 miles	0.17%
2436-82-8144	709	Newcomb	Yes	74	0.2 miles 0.5 miles - r	0.42% 0.17%
2436-56-2464	1781	Owen	Yes	2	0.9 miles	0.08%
2436-56-5125	N/A	Shelton	Yes	2	0.9 miles	0.08%

Table 3: Inventory of Property within 1-mile of the proposed LCS – Pittsylvania County GIS Site						
Parcel ID	Street Number	Owner	Residence	Acreage	Distance to LCS (turbine stacks)	Maximum Annual LCS PM2.5 Concentration % of NAAQS
2436-56-5566	1760	Waller	Yes	4	0.9 miles	0.08%
2436-67-5325	N/A	Motley	No	235	0.8 miles	0.17%
2436-56-8370	1660	Motley	Yes	6	0.8 miles	0.08%
2436-92-6983; 2436-92-7854	629	Chaney	Yes	1	0.7 miles	0.17%
2436-92-8799	597	Montgomery	Yes	1	0.7 miles	0.17%
2436-92-9685	575	Montgomery	No	2	0.7 miles	0.17%
2436-92-7582	N/A	Montgomery	No	1	0.7 miles	0.17%
2446-13-3493	412 416	Reynolds	Yes	35	0.8 miles	0.08%
Properties generally to the east of the proposed LCS						
2446-01-0258	N/A	Unknown	No	37	0.5 miles	0.17%
2446-23-4022	N/A	Evans	No	93	0.6 miles	0.17%
2446-01-9342	N/A	Shelton	No	10	0.8 miles	0.08%
2446-11-8650	4563	Shelton/Adkins	Yes	3	0.9 miles	0.08%
2446-11-6467; 2446-11-6306	4521	Shelton	Yes	2	0.9 miles	0.08%
2446-11-4365; 2446-11-1154; 2446-11-3245	4421 4437 4469	Shelton	Yes	3	0.9 miles	0.08%

As described below, DEQ (and MVP) conducted significant outreach to these communities in an effort to engage them and provide them with meaningful involvement in the air permit

process, and DEQ has analyzed the air quality impacts from the proposed LCS to assess whether there is any disproportionate impact (as defined by VEJA).

Commenters did provide information obtained via EJSCREEN to indicate an overburdened population because of the existing Transco compressor station. This included specific references to the PM2.5 EJ Index and the Air Toxics Cancer Risk EJ Index. An EJ Index is the product of three variables: the value of the environmental indicator, the difference between the minority and low income data for the area versus the national average, and the population of the area. These values are then ranked to achieve a percentile for the area. EJSCREEN lists the PM2.5 and ATCR, the environmental indicator not the EJ Index, for the area at or below the 47th percentile in Virginia. This means the area residents breathe air that is cleaner than more than half of Virginians. These percentiles are supplemented by the American Lung Association "State of the Air" report referenced by some commenters, which gives Lynchburg, VA and Roanoke, VA, (locations with similar air quality to Pittsylvania County despite even greater particulate matter emissions) air quality "A" grades for particulate matter. EPA does make clear that EJSCREEN is a screening utility to determine whether or not additional scrutiny is warranted. By requesting that MVP conduct its EJ assessment and closely analyzing the air quality impacts from the proposed LCS, DEQ has used it for this purpose.

It should also be noted that the EJSCREEN PM2.5 data referenced by commenters is from 2017. As demonstrated above and in DEQ's air quality analysis, the ambient PM2.5 concentrations in Virginia have continued to decrease. More specifically for the immediate vicinity of the proposed LCS, the actual PM2.5 emissions from the Transco compressor station declined by 13.9 tons/yr from 2019 to 2020.

LCS-20 Comment

Commenters indicate that DEQ's (and MVP's) environmental justice review and implementation was lacking in several areas. Commenters indicate that EJ communities were not provided the opportunity to participate in the full cycle of decision making. Commenters suggested the Lawrence EJ Report was inadequate or incomplete since the ground truthing element was hampered by the COVID-19 pandemic and she only interviewed one member of the Blairs African-American community. Some commenters indicated that virtual public meetings did not provide access to community member with limited/no internet access. Commenters noted several pieces of statutory text covering EJ, including the Virginia Environmental Justice Act (VEJA) and DEQ's statutory policy statement.

DEQ Response

DEQ is committed to environmental justice and enhancing public participation in the permitting processes. To the extent commenters are stressing the general need to take additional action to promote environmental justice, DEQ continues to work to improve the processes of the Department as a whole.

In accordance with § 2.2-235 of the Code of Virginia, "It is the policy of the Commonwealth to promote environmental justice and ensure that it is carried out throughout the Commonwealth, with a focus on environmental justice communities and fenceline communities."

As noted in the draft engineering analysis, DEQ determined the area around the site contained environmental justice communities. DEQ then conducted a two-step analysis based on the definition of environmental justice: the "fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulations, or policy." The primary components of the two-step analysis were enhanced outreach (step 1) to provide the opportunity for meaningful community involvement and an air quality analysis (step 2) to assess fair treatment. The following response focuses on enhanced outreach. The response to comment 21 focuses on fair treatment.

Some commenters referenced the National Association for the Advancement of Colored People's (NAACP) report entitled "Fumes Across the Fenceline," describing a disproportionate amount of oil and gas development facilities near minority communities. DEQ has specifically addressed the emissions from the proposed LCS and evaluated the associated air quality impacts. Emissions from drilling/fracking, processing of the collected gas, and fugitive emissions from the report's well-field facilities are not of comparable scale to LCS's post-combustion and control device stack emissions. Also of note, the NAACP report looks at communities in areas that are not in compliance with the NAAQS for ozone, which is not the case in Pittsylvania County where the existing air quality is good. Separately, emissions from natural gas production and transmission is the subject of on-going work by DEQ to reduce emissions from that sector.

Regarding outreach, members of the public, including members of the local environmental justice communities had ample opportunity to participate in the full spectrum of DEQ's permitting process. As noted in the draft engineering analysis, the public participation process for the draft permit included a public comment period that began January 8, 2021 and was extended until April 9, 2021. A virtual public hearing was conducted during evening hours on February 8, 2021. To assist members of the public on providing comments and inform them of the project details, DEQ also conducted a virtual public briefing (also during evening

hours) prior to the start of the public comment period on January 7, 2021. To ensure adequate advance notice for all of this public engagement, DEQ published a notice in the *Chatham Star-Tribune* newspaper on December 18, 2020. DEQ also posted a copy of the notice on the agency's website and social media accounts and sent copies to local civic groups, churches, schools, and libraries including the following: tribal communities, medical centers, chief elected officials of Chatham and Pittsylvania County government, chief administrative officer of Pittsylvania County, Pittsylvania County administrators, local planning commission, and the regional planning district commission.. In addition to the initial public notice, DEQ sent three separate reminder notices of the public participation process on January 6, 2021, February 4, 2021 and March 9, 2021. These notices were also distributed to a wide audience using multiple communication channels (physical mail, electronic mail and social media accounts). The social media outreach included Facebook (paid advertisement), Twitter and Nextdoor. The on-line response rate metrics indicate greater than 3,000 views. DEQ also arranged for information regarding the public briefing and comment period to be announced (public service announcement) on local radio stations in both Danville and Chatham. DEQ staff also participated in a virtual meeting with the Pittsylvania County NAACP on January 5, 2021. During this meeting, DEQ answered questions about the project, informed the members of the public comment period and specifically invited the NAACP participants to participate in the public briefing. During this meeting, as well as during the briefing, DEQ provided the direct contact information (email, phone number, mailing address) for the DEQ staff working on the draft permit. It should also be noted that the elected political leader of the minority-majority Banister District[24] (local Board of Supervisors position) participated in the public hearing and commented in support of the proposed LCS. During the public briefing, public comment period and public hearing, members of the public had the ability to comment and/or ask questions regarding every part of the draft permit and associated documents. This included the BACT analysis, the EJ assessment, the air quality analysis, the application documents and applicable requirements and enforcement mechanisms of the permit itself. Indeed, DEQ received over 300 questions and comments during the public comment period. Of these 300 comments, only five comments in opposition to the draft permit were received from Chatham-area (mailing address) residents, and only one of these five comments was submitted by a citizen living within 1 mile (out of a total of approximately 45 residences[25] all of which received direct mailings regarding the project) of the proposed LCS. With respect to the siting of proposed LCS, that is not a question over which DEQ has authority. However, the siting of the proposed LCS was reviewed during the U.S. Federal Energy Regulatory Commission (FERC) approval for this project. MVP's EJ Report notes

[24] This is the Pittsylvania County electoral district in which the proposed LCS is located.
[25] Table 3 of this document.

that this FERC process included substantial engagement with the public (with at least 2 in-person meetings in Chatham, Virginia), and included consideration of EJ communities.

Regarding limited internet access, both the virtual public briefing and the virtual public hearing included means for the public to dial in using a normal phone line to listen to the event proceedings. This included the contact information of DEQ staff to contact with questions or submit written comments.

In addition to the public engagement associated with the FERC approval process, MVP has submitted information demonstrating substantial public engagement specific to the draft permit for the proposed LCS. As described in the Lawrence EJ report, this public engagement included multiple interviews with Pittsylvania County residents including several citizens of indigenous descent and one prominent member of the African-American community. Although only one African-American member of the public agreed to be interviewed by Dr. Lawrence, MVP solicited input via direct mailings and email/website contact to all local residents and, specifically, to 14 churches or organizations headed by or serving African-American communities. MVP has also engaged in direct mailings to every resident located within 1.5 miles of the proposed LCS. This included the Environmental Justice Coordinator for the Pittsylvania County NAACP. These direct mailings included notice of DEQ's public comment period and a separate notice of the public hearing/comment period to schools, libraries and local landowners. Beginning in January 2021, MVP has engaged a local radio station, WKBY, to run a 60-second informational advertisement every two hours. Although some comments indicate the Lawrence EJ report is inadequate on its own, it was just one element of the outreach and engagement conducted by MPV and DEQ.

In addition to the efforts described above, DEQ recognizes the particular expertise of various local organizations that know a community to help facilitate the dissemination of information. Local groups have systems to notify people that go beyond DEQ's ability. Using these multi-pathway notifications helps to reach the widest possible audience with the resources available. DEQ strives to provide an atmosphere of inclusivity, both through the use of briefings to explain the project and regulatory process and by ensuring a permitting contact is available to answer any questions. DEQ continues to work on improving the processes used for outreach and notifications and is looking forward to implementing suggestions from the recent environmental justice report DEQ commissioned to review agency practices. As demonstrated through this response and the described materials in the record, members of the public, including the members of EJ communities, had full access to and ability to participate in the permitting process for the proposed LCS draft permit.

LCS-21 Comment

Some commenters indicate that DEQ's conclusion that there would be no adverse/disproportionate air quality impact was incorrectly based on compliance with the NAAQS ("We therefore ask the board to make an explicit finding that compliance with the NAAQS is not conclusive evidence that the proposed project will have no adverse health effect on local communities and individuals, particularly vulnerable populations."). The comments indicate that the Buckingham Compressor Station decision[26] (BCS) prohibits the use of the NAAQS for this purpose (MVP/DEQ's "no disproportionate adverse impacts" based on "mere" compliance with the NAAQS claim is incorrect based on BCS). More specifically, some comments presented information that asserts the PM2.5 annual NAAQS (12 μg/m^3) is not protective of public health and/or that any increase in PM2.5 constitutes an adverse/disproportionate impact (BCS faulted DEQ for (a) failing to make...findings regarding the character of local population...(b) failing to individually consider the potential degree of injury from air pollution....(c) relying on incomplete evidence.). These comments generally indicate that BCS supports their interpretation. Some comments indicate that the annual PM2.5 NAAQS should be lowered to a range of 8-10 μg/m^3, and that this is the standard that should be used for the proposed LCS.

DEQ Response

In processing the application and developing the proposed permit, DEQ considered EJ within the context of the Code of Virginia § 10.1-1307.01 (1307E) as well as the independent authority of the VEJA. DEQ's consideration resulted or played a key role in the following discrete measures, decisions or determinations:

- The decision by the source to install beyond BACT air pollution control systems (SCR, oxidation catalyst, LDAR) for NOx, CO, VOC and various toxic pollutants.
- The decision to require a cumulative ambient air quality analysis for a minor stationary source.
- The decision to recommend the applicant perform an EJ analysis.
- The extensive public engagement activities by both DEQ and the applicant (as noted earlier).
- DEQ's review of the EJ analysis and the ambient air quality analysis to ascertain whether the proposed permit resulted in any adverse or disproportionate air quality impact on any EJ community. As indicated below, DEQ has determined that there will not be such impact.

[26] United States Court of Appeals for the Fourth Circuit; No. 19-1152.

It should be noted that based upon the historic process of its application and the policies under which it was originally created, consideration of environmental justice should not be considered as a guarantee of any particular outcome.[27] This has not been changed by any of the cited authorities for environmental justice considerations, including the VEJA, Virginia Code section 10.1-1307E, or other authorities. For example, the VEJA establishes that "It is the policy of the Commonwealth to promote environmental justice and ensure that it is carried out throughout the Commonwealth, with a focus on environmental justice communities and fenceline communities" where EJ " means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy. Further, "fair treatment means the equitable consideration of all people whereby no group of people bears a disproportionate share of any negative environmental consequence resulting from an industrial, governmental, or commercial operation, program, or policy."

.

DEQ's consideration of EJ, including demonstrating compliance with the NAAQS and Significant Ambient Air Concentrations[28] (SAACs) for this project, is by no means a "box-checking" exercise".

The Clean Air Act lays out the process and requirements for the determination of protective air quality for the United States. The National Ambient Air Quality Standards (NAAQS) are set by EPA after reviewing the available scientific information on the health impacts for each criteria pollutant. EPA then follows a regulatory process to promulgate (or make final) the NAAQS, accepting comments and any accompanying information from any member of the public. The resulting final NAAQS is protective of all people, including any sensitive groups, as required and promulgated pursuant to the Clean Air Act. Each NAAQS is then reviewed and changed/revalidated every 5 years, following the same process of scientific review, using up-to-date information, and the regulatory process including public participation. Part of EPA's recent NAAQS reviews has included environmental justice reviews to ensure the fair treatment and meaningful involvement for all people in accordance with President Clinton's EO12898. The Clean Air Act then requires each State to have a program to ensure that increases in activities occur while maintaining the air quality below the NAAQS. Part of that program is the preconstruction major new source review permitting programs such as the Prevention of Significant Deterioration (PSD) permit program. In order for a source to obtain approval for construction of an activity, the PSD program requires a review of the pollutants emitted in significant amounts and ensure they are compliant with the NAAQS. If the metrics

[27] *In re Avenal Power* (EAB 2011).
[28] The health-based ambient air concentrations established for toxic pollutants by DEQ's regulations (Chapter 60, Article 5).

are met, meaning the impact of the project will not worsen air quality beyond the NAAQS, there is no adverse air quality impact from the project and the PSD permit is issued.[29] Although DEQ has developed the draft permit under its minor new source review program (in accordance with its regulations), the air quality analysis conducted was substantially similar to the analysis required for a PSD permit. The NAAQS are established according to the best science to ensure that no one breathes unhealthy air. They are designed to protect the health of sensitive populations with an adequate margin of safety, the NAAQS "inherently take certain environmental justice factors into account as part of the standard-setting process."[30]

Commenters specifically mentioned the Integrated Science Assessment and the finding of a link between short-term PM2.5 exposures and cardiovascular effects. Comments noted other published scientific articles published in various journals. This is exactly the type of scientific review and data that EPA considers in a NAAQS review. Almost all the documents referenced by commenters predate the recent (2020) NAAQS reviews for PM2.5 and ozone. The NAAQS for both pollutants have recently been reviewed, and EPA published a final rule retaining the current ozone NAAQS on December 31, 2020 and a final rule retaining the current PM2.5 NAAQS on December 18, 2020. Many commenters on this action state that "any increase" in air pollution is unacceptable or constitutes a disproportionate adverse impact. In support of this position, commenters cite statements by EPA staff, the report of one health expert or EPA references (for example, 78 Fed. Reg. at 3098, a reference from EPA's 2013 PM2.5 NAAQS review). However, in its final rule (December 18, 2020) concluding the recent review of the PM2.5 NAAQS, EPA states "For the primary PM2.5 standards, the Administrator concludes that there are important uuncertainties in the evidence for adverse health effects below the current standards and in the potential for additional public health improvements from reducing ambient PM2.5 concentrations below those standards. Based on the available evidence, the Administrator has concluded that the current primary PM2.5 standards are requisite to protect public health, with an adequate margin of safety, from effects of PM2.5 in ambient air and should be retained, without revision. Therefore, the EPA is retaining those standards (*i.e.*, both the annual and 24-hour standards), without revision."[31] Further, as described above, the Clean Air Act is predicated on allowing economic activity to occur in the United States while maintaining a level of air quality deemed protective through a scientific and public process. EPA follows a regulatory process whereby

---

[29] The Clean Air Act also provides for increased activities for areas that do not meet the NAAQS; referred to as nonattainment areas. That program requires different levels of review to ensure that the project results in a reduction in emissions; however, a nonattainment new source review permit may still be issued if the area will continue to be nonattainment after the project.
[30] EPA, *Plan EJ 2014 Legal Tools*
[31] 85 Fed. Reg. at 82685.

all available scientific information is reviewed, weighed, and then subject to public review and comment.

Regarding EPA's approach on "...disproportionate...negative...consequences", EPA's Environmental Appeals Board (EAB) has determined (*see Energy Answers Arecibo, LLC 2014*) that:

> "The Board generally 'relies on and defers to the Agency's cumulative expertise' where the permit issuer's environmental justice determinations are based on a proposed facility's compliance with the relevant NAAQS. *See Shell 2010* 15 E.A.D. at 156 (explaining that, '[i]n the context of an environmental justice analysis, compliance with the NAAQS is emblematic of achieving a level of public health protection that, based on the level of protection afforded by a primary NAAQS, demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants'); *see also In re MHA Nation Clean Fuels Refinery*, 15 E.A.D. 648, 669 n.59 (EAB 2012). NAAQS are designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. *See In re AES Puerto Rico*, LP, 8 E.A.D. 324, 351 (EAB 1999), *aff'd sub nom. Sur Contra La Contaminación v. EPA*, 202 F.3d 443 (1st Cir. 2000); *see also Shell 2010*, 15 E.A.D. at 149 n.72."

The EAB also reached similar findings *In re Pio Pico Energy Ctr.* 16 EAD 56 (EAB 2013) and *In re Avenal Power* 15 E.A.D. 384, 399 (EAB 2011).

DEQ's Environmental Justice analysis also assessed cumulative air quality impacts. The air quality analysis assessed the impacts from the proposed project, other nearby stationary sources (including the adjacent Transco compressor station) and worst-case background ambient air concentrations. The air quality analysis additionally considered the worst-case short term emissions from the proposed project. This information is set forth in the draft engineering analysis as well as responses to other comments in this document. It should be further noted that computer model based air quality analyses have generally proven to over-estimate ambient air concentrations when compared against actual monitored ambient air concentrations.

- As described above, the creation and adoption of the NAAQS is a detailed legal and scientific process that is solely based on public health and does not consider economic cost. Some commenters would have DEQ dismiss the NAAQS, however, the NAAQS are the basis of the Clean Air Act from which Virginia's relevant Air Pollution Control Law, SIP and minor NSR regulation all flow. Nothing in 1307E, any EJ authority or precedent

commands or suggests that DEQ substitute or create location-specific air quality standards (for an EJ community or otherwise). For example, the EPA Civil Rights Toolkit[32] specifies the NAAQS as the standards by which potential air quality related issues are to be judged. Any attempt to create such site-specific standards would by its very nature be arbitrary and lead to a patch-work quilt of differing air quality standards spread across nebulous geographic regions of the Commonwealth. This result would directly conflict with the purpose of the Clean Air Act; to establish uniform air quality standards providing for healthy air for everyone including sensitive populations, including members of environmental justice communities. Adherence to these standards helps ensure that there is no disproportionate impact on any EJ community since the standards apply equitably to all communities. Such a regime would, of course, also be impossible for DEQ to administer from a resource standpoint. Some commenters also suggest that the BCS decision and/or EJ authorities demand a result that any air permit issued by DEQ result in no (zero) ambient air quality impact. This would lead to DEQ restricting, and prohibiting all economic activity within or near any EJ community. DEQ's implementation of the disproportionate impact element of the EJ review for this action is a reasonable approach: a comprehensive review of the cumulative air quality impacts from the proposed project in conjunction with an analysis of the source-specific air quality impacts on the specific EJ community, taking into account the specific characteristics of the community, with both the cumulative review and the source-specific analysis based on the only legally applicable air quality standards (the NAAQS and the SAAC). The air quality analyses performed by DEQ include direct consideration of the character of the community with regard to its geography, topography and nearby stationary sources of air pollution.

- The air quality analysis submission by the applicant and DEQ's review and consideration of the same was an extensive and detailed fact-based exercise. As previously described, this analysis included the worst-case emissions from the proposed facility, conservative ambient air quality background data, and the doubled-counted (already included in the background values) emissions from other nearby sources (including the Transco stationary source). It is this analysis that informs DEQ's judgement regarding the "local character and degree of injury" element of 1307E. Nothing in 1307E or the VEJA requires a different approach.
- The result, compliance with the NAAQS and SAAC in this case, is by no means a forgone conclusion. Millions of people in the United States (including many in northern Virginia) live in areas where the air quality does not meet one or more NAAQS. Even in areas of the country, including Virginia, which are designated as attainment areas for all of the NAAQS, the potential for non-compliant "hot spots" theoretically exists. DEQ's NAAQS analysis is also far from blind. Having identified the EJ communities described earlier,

[32] U.S. EPA's External Civil Rights Compliance Office Compliance Toolkit - Chapter 1; January 18, 2017.

DEQ required MVP to perform an air quality analysis in this case even though the vast majority of permits for minor stationary sources are not required (for resource reasons) to do so. It should be noted that the very low ambient air quality concentrations modelled in this case demonstrate the appropriateness of DEQ's position. To the knowledge of DEQ, there is no permitting authority (local, state or federal) that has applied ambient air quality standards that are more stringent than the NAAQS in the context of a NSR permit or an EJ analysis. With regard to public health data supplied by some commenters regarding the PM2.5 NAAQS, this permit process is not a venue or opportunity to re-litigate or revise the NAAQS. The comments even acknowledge the central and relevant importance of the NAAQS under the CAA. The current PM2.5 NAAQS was established under the Obama Administration and retained by the Trump Administration. As some comments admit, much of the information presented by the comments was available to EPA during those reviews.

- Moving beyond a robust demonstration of compliance with the NAAQS, DEQ has examined the public health information presented by the applicant and commenters and determined that the proposed permit will result in ambient air quality concentrations well below the NAAQS such that public health is protected. For example, the predicted cumulative PM2.5 annual concentration (the pollutant which was the subject of most comments) of 7.9 $\mu g/m^3$ is below even the alternate standard of 8.0 $\mu g/m^3$ suggested by some commenters. The maximum contribution of the proposed LCS (0.14 $\mu g/m^3$) is just a small fraction of this number. DEQ has also not ignored the character of the population of the EJ community in which the LCS is proposed to be located. It is precisely this kind of sensitive population that the NAAQS are designed to protect. As shown earlier in Table 3, DEQ analyzed the PM2.5 ambient air impacts from the proposed LCS on each property of the EJ community located within 1-mile of its location. These impacts are mere fractions of 1% of the NAAQS and are below levels (0.2 $\mu g/m^3$ for annual PM2.5) EPA has determined to be statistically insignificant.[33]
- To the extent that the BCS decision requires DEQ to analyze for disproportionate impact beyond overall compliance with the NAAQS (with a significant margin for most pollutants) and consideration of fractional source-specific emissions impact, the case-specific circumstances are different for LCS. The air quality analysis shows that the greatest off-site impact from the LCS's emissions occurs on the property of the Transco compressor station and not on any residence or business; i.e. the EJ community. For example, the maximum annual PM2.5 ambient impact on any non-Transco, non-MVP property is 0.07 $\mu g/m^3$, and the maximum annual PM2.5 ambient impact on any residence

[33] Memorandum from Peter Tsirigotis, Director, Office of Air Quality Planning & Standards, EPA, to Regional Air Division Directors, Regions 1-10, Attachment at 10-11 (April 2018)

is 0.02 $\mu g/m^3$. These values are significantly less than the maximum annual PM2.5 impacts on MVP property (0.14 $\mu g/m^3$) or Transco property (0.11 $\mu g/m^3$). The air quality impact profile is similar for the other pollutants[34,35] emitted by the proposed LCS. The maximum residence impact value (0.02 $\mu g/m^3$) is only 0.17% of the relevant NAAQS (12 $\mu g/m^3$) and below the sensitivity (method detection limit) of current ambient air monitoring technology to detect. This level of impact is below any reasonable de minimus level and is effectively zero. Further, none of the public health data provided by commenters address pollutant concentrations at levels this low. Thus, DEQ has concluded that the EJ community (consisting of census block group 1005-001) will not bear a disproportionate share of any negative air quality consequence resulting from the proposed LCS. The other EJ communities discussed earlier will experience even smaller air quality impacts. This demonstrates that no community member is expected to suffer adverse air quality impacts from LCS, and there will be no disproportionate impacts to an EJ community. To be clear, the greatest air quality impacts from the proposed LCS occur on the Transco Compressor station, and therefore do not fall on any EJ community.

LCS-22 Comment

One commenter indicates that DEQ's finding (draft engineering analysis) that Pittsylvania County is considered a "locality particularly affected" for the purpose of Section 10.1-1307.01 of the Air Pollution Control Law contradicts DEQ's statement concluding "that no EJ community bears a disproportionate share of any such impacts." The commenter requests that DEQ "provide further explanation and justification for the assumption defining 'identified disproportionate material air quality impact.'"

DEQ Response

Prior to the 2020 General Assembly action revising Section 10.1-1307.01 of the Air Pollution Control Law noted by the commenter, the term "locality particularly affected" already appeared in Section 10.1-1307.01 (in what is now paragraph A of that Section). As in paragraph B of the Section, the term is used in paragraph A as a determinate of whether additional public participation requirements apply to certain types of air permits (new major source and major modifications to existing sources). The definition of the term (…identified disproportionate material air quality impact…) in the Section was also the same prior to the 2020 revision. DEQ has an existing guidance document (APG-102[36]) that was developed to implement the pre-2020 version of the Law. This guidance document directs DEQ staff to

[34] June 2020 MVP permit application (NOx Isopleths)
[35] MVP EJ Report (toxic pollutant isopleths)
[36] Air Permit Guidance-102 (APG-102): Memo Number 99-1004 dated August 19, 1999 (amended January 25, 2010)

determine whether there is any disproportionate material air quality impact based on air quality modeling, and it specifies various pollutant-specific "significant" concentration levels for that purpose. Since the revision to Section 10.1-1307.01 did not revise the definition or alter how the term "locality particularly affected" was used, DEQ used its existing guidance in its analysis of this issue for the proposed LCS.

Table 4: APG-102 Evaluation		
Pollutant	**Maximum Impact from Proposed LCS**	**APG-102 significant concentration**
NO_2 (annual)	1.4 $\mu g/m^3$	1 $\mu g/m^3$
PM10[37] (24-hour)	1.3 $\mu g/m^3$	5 $\mu g/m^3$
Carbon Monoxide (CO) (8-hour)	48 $\mu g/m^3$	500 $\mu g/m^3$
CO (1-hour)	156 $\mu g/m^3$	2,000 $\mu g/m^3$

As shown in Table 4, the maximum predicted annual NO_2 impact from the proposed LCS (1.4 $\mu g/m^3$) is greater than the APG-102 significance level (1 $\mu g/m^3$). Therefore, DEQ determined that Pittsylvania County was a "locality particularly affected". Accordingly, DEQ required MVP to meet the enhanced public notice requirements of the Section.

To the extent that commenters claim that Pittsylvania County's designation as a "locality particularly affected" means there must also be a "disproportionate share of any negative environmental consequence", it should be noted that the two terms appear in completely different sections of Virginia law (Section 10.1-1307.01 vs. Section 2.2-234) and do not share the same definition. There is no connection between the two terms, and one has no bearing on the other. Further, the maximum annual NO_2 impact (1.4 $\mu g/m^3$) described in Table 4 (and all modeled impacts greater than 1 $\mu g/m^3$) occurs on MVP property. In other words, there is no annual NO_2 impact greater than 1 $\mu g/m^3$ on any non-MVP property. Table 4 demonstrates that all other modelled pollutants were below their respective AP-102 significance levels. Therefore, even if there is a legal equivalence between the two terms, there is no "identified disproportionate material air quality impact" on any non-MVP property, i.e. the EJ community.

LCS-23 Comment

Commenters stated that the Board must consider site suitability in accordance with the 4 factors contained in Section 10.1-1307 E of the Air Pollution Control Law of Virginia.

[37] PM10 is particulate matter with an aerodynamic diameter less than or equal to 10 microns

DEQ Response

DEQ's draft engineering analysis addressed the site suitability provisions of Section 10.1-1307 E of the Air Pollution Control Law of Virginia, and it concluded that the site was suitable from an air quality perspective. The only comments that challenged this conclusion with any specificity did so on EJ grounds (multiple commenters), greenhouse gas (GHG) provisions (1 commenter) and impacts of main MVP pipeline as opposed to the proposed LCS. The EJ related comments have been addressed in the response to EJ comments, and impacts of the main MVP pipeline are outside of DEQ's authority; it can only consider the stationary source in question.[38] In addition, MVP's July 2020 application included a site suitability analysis which no commenter directly challenged. This analysis, as supplemented by the MVP EJ report, addresses safety, noise and traffic issues.

With regard to GHG emissions, such emissions are not legally subject to regulation[39] for minor new source review permits. Further, nothing in 1307E or any other authority requires the consideration of GHG under 1307(E)(2). While the commenter states that the GHG emissions (~126,000 tons per year of CO2e) from the proposed LCS would "effectively negate a substantial portion" of Virginia's planned GHG reductions (Virginia Clean Economy Act, RGGI), those GHG authorities do not address the non-electric generating unit (EGU) industry, and the emission reductions anticipated from those programs are on the order of millions of tons of carbon dioxide equivalents (CO2e). The proposed LCS will also not alter the Commonwealth's ongoing GHG reduction efforts. The draft permit requires measures (pressurized hold, leak detection and repair and emergency shut down test block valve) that will minimize GHG (primarily methane) emissions.

In accordance with Section 10.1-1307 E of the Air Pollution Control Law of Virginia, consideration has been given to the following facts and circumstances relevant to the reasonableness of the activity involved and the regulations and draft permit proposed to control it:

1. The character and degree of injury to, or interference with safety, health, or the reasonable use of property which is caused or threatened to be caused:

The activities regulated in this permit have been evaluated consistent with 9VAC5-50-260 (Best Available Control Technology for PM2.5 and formaldehyde) and have been determined to meet these standards. BACT-like controls were also applied for NOx, VOC, carbon

[38] Circuit Court for the City of Richmond: *The Virginia Chapter of the Sierra Club v. The Virginia State Air Pollution Control Board (2017)*

[39] Utility Air Regulatory Group v. Environmental Protection Agency 573 U.S. 302 (2014)

monoxide (CO) and hexane. Please see the draft Engineering Analysis for a description of the Best Available Control Technology (BACT) included in the permit. Please refer to the draft Engineering Analysis, and responses in this document, for more information on the applicability of the State's Toxics Rule to the proposed project.

For the project, air quality modeling was conducted to predict the maximum ambient impacts of NOx, CO, PM10, PM2.5, formaldehyde and hexane emitted by the proposed source.

In summary, results of modeling conducted for emissions from the proposed facility show compliance with the health-based NAAQS and other applicable air quality criteria. Accordingly, approval of the proposed permit is not expected to cause injury to, or interference with safety, health, or reasonable use of property.

Information on the DEQ modeling analysis is available in Attachment 2 - Modeling Memo of the draft engineering analysis. Additional details are also provided in responses to specific modeling comments later in this document.

MVP's application's consideration of this issue included a safety and property value assessment.

2. The social and economic value of the activity involved:

MVP's application considered this issue and noted the demand for natural gas (North Carolina), the approval by FERC and the support of Pittsylvania County Board of Supervisors (PCBOS) (tax base). This was confirmed by the comments of multiple PCBOS members during the February 8, 2021 public hearing.

3. The suitability of the activity to the area in which it is located:

Consistent with §10.1-1307 E. of the State Air Pollution Control Law, DEQ has considered the facts and circumstances relevant to the reasonableness of the activity involved and the permit proposed to control it. Co-locating the proposed LCS with existing natural gas infrastructure minimizes disruption. The area is not densely populated, the property allows a significant buffer and there are no nearby residences. Alternative sites were considered during the FERC review, and concluded that the proposed location is suitable. Operation of the proposed LCS as designed and permitted is suitable to the area. The activities controlled by this permit are deemed suitable as follows:

a. Air Quality characteristics and performance requirements defined by the State Air Pollution Control Board (SAPCB) regulations: This permit is written consistently with existing applicable regulations controlling air pollution. The emissions for the primary pollutants associated with this permit have likewise been modeled and have been shown through modeling to not cause or contribute to a violation of the ambient air quality standards.

b. The Virginia Department of Historic Resources (VDHR) has determined that the proposed LCS is not likely to impact any known historic or cultural resources. In addition, VDHR has approved MVP's plan to address any unanticipated discoveries.

4. The scientific and economic practicality of reducing or eliminating the discharge resulting from the activity:
The Minor New Source Review program requires consideration of levels of control technology that are written into regulation to define the level of scientific and economic practicality for reducing or eliminating emissions. By properly implementing the Regulations while developing the proposed permit, DEQ has addressed the scientific and economic practicality of reducing or eliminating emissions associated with this project. In addition to that review, MVP agreed to install and operate selective catalytic reduction and oxidation catalyst in order to further reduce emissions of nitrogen oxides, carbon monoxide, VOC, and volatile hazardous air pollutants such as formaldehyde. While these technologies are installed on combustion turbines at power plants, those power plants are often close to 100 times larger than the proposed LCS, making the economics of installation significantly different.

In summary, the proposed LCS will be located at a site with industrial activities already in place in a rural, sparsely populated area. The closest residence is 0.5 miles, with the area between being other commercial/industrial properties. The area is in attainment (i.e., is meeting all air quality standards) for all criteria pollutants. As discussed in this response as well as other responses to comments and the original draft engineering analysis, this proposed LCS constructed and operated in compliance with the application and the draft permit will not create any air pollution issues with respect to attainment status. Consistent with the provisions of the draft, MVP has mitigated the emissions to the greatest extent within the bounds of scientific and economic practicality.

Based on this review of the proposed activity and the permit proposed to control it, the site is suitable for the proposed LCS.

General Modeling

LCS-24 Comment

A commenter questioned if modeling takes into account the different molecular weights of the plume constituents from both combustion emissions and station leak emissions.

Commenters suggested the modeling should be performed using a more reliable and appropriate air model other than AERMOD, such as ADMS-3.

Commenters also stated that the analysis failed to demonstrate the LCS would not prevent or interfere with the NAAQS.

Commenters indicated that DEQ has not ensured that all areas of ambient air have been modeled.

DEQ Response

The goal of the cumulative impact assessment is to demonstrate with an adequate degree of confidence in the result that the proposed facility will not cause or significantly contribute to violations of the NAAQS. In general, the more conservative the assumptions on which the cumulative analysis is based, the more confidence there will be that the goal has been achieved and the less controversial the review process will be from the perspective of the reviewing authority. DEQ follows this premise by using conservative modeling assumptions throughout the analysis.

The air quality modeling analysis for the LCS conforms to 40 CFR Part 51, Appendix W - Guideline on Air Quality Models (Guideline) and was performed in accordance with DEQ-approved modeling methodology. The NAAQS and toxics modeling results are within all applicable air quality standards.

The air quality model used for the analyses was AERMOD. AERMOD is the preferred EPA-approved regulatory model for near-field applications. The AERMOD model inputs are derived from representative data surrounding the project site.

The "Guideline on Air Quality Models" is used by the EPA, other federal, state, territorial, and local air quality agencies to prepare and review new source permits and source permit modifications. The Guideline serves as a means by which national consistency is maintained in air quality analyses for regulatory activities. In November 2005, the EPA formally adopted AERMOD as the preferred dispersion model for many regulatory applications. This promulgation of AERMOD represented the culmination of over a decade of development, evaluation, and review, including multiple rounds of public comment through the formal rule making process. In 2017, the EPA finalized a 2015 proposal that updated the Guideline and included enhancements to the formulation and application of AERMOD.

Alternative models such as ADMS-3 may be proposed by an applicant but are subject to the rigorous model performance evaluation requirements contained in the "Guideline on Air Quality Models." The model must be shown to be equivalent or perform better than the preferred model, AERMOD, for this particular application. No specific model performance data were provided for ADMS-3 during the comment period.

AERMOD does include options that account for molecular weight in order to calculate gas deposition (i.e., dry and/or wet mechanisms). AERMOD also contains the option to specify the deposition velocity for dry deposition. These options are non-regulatory and are not used in permit modeling because they often result in lower, less conservative modeled ambient air concentrations.

Finally, EPA defines "ambient air" as "that portion of the atmosphere, external to buildings, to which the general public has access." All such areas were included in the modeling analysis consistent with EPA guidance.

Meteorology

LCS-25 Comment

Commenters were concerned that an accurate air quality modeling analysis was not performed and questioned the appropriateness of modeling inputs such as meteorology, including proximity, topography, and airport data, and seasonal variability of impacts due to inversions.

DEQ Response

DEQ meteorologists conducted a comparison of meteorological data from Chatham, Virginia and Lynchburg, Virginia. This review was performed to ensure that the data were appropriately representative of the project site. Both are located in Virginia's Piedmont region that contains the rolling foothills and river valleys between the Coastal Plain and the Blue Ridge Mountains. DEQ evaluated several meteorological parameters such as wind speed, wind direction, temperature, and precipitation and concluded that the Lynchburg data are representative of the project site in Pittsylvania County.

The Lynchburg, Virginia National Weather Service (NWS) site is the closest and most representative dataset that is suitable for input to AERMET, the meteorological preprocessor for AERMOD. AERMET requires specific meteorological parameters such as 1-minute and 5-minute wind speeds, which are available at select NWS sites. Danville, Virginia also has the data that can be used as input to AERMET. However, both DEQ and EPA determined

that tree obstructions near the Danville Airport meteorological tower prohibited use of these data for regulatory modeling.

Guidance for air quality modeling recommends the use of one year of onsite meteorological data or five years of representative off-site meteorological data. Since onsite data are not available for the LCS, meteorological data available from the Lynchburg Regional Airport (LYH) and upper air data from the Piedmont Triad International Airport in Greensboro, NC (GSO) for the period 2012-2016 were generated using the most recent version of AERMET. The data were processed by DEQ and provided to the applicant.

The commenters correctly pointed out that inversions occur in Pittsylvania 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 5-year meteorological data set used in this analysis. Therefore, DEQ affirms that the meteorological data is representative and appropriate for assessing these conditions.

Nearby Source Inventory for Cumulative NAAQS Analysis

LCS-26 Comment

Commenters suggest that the modeling analysis did not include all contributing sources.

Commenters asserted the data for the nearby sources such as the emission units, their corresponding modeled emission rates, and the basis for the modeled emissions that were included in the cumulative NAAQS analysis should be provided in another form other than the modeling files for public review.

DEQ 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.

Concentration gradients 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 the maximum 1-hour 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.

DEQ carefully evaluated all nearby sources for potential inclusion in the analysis. The emissions inventory included in the modeling consisted of 25 facilities, including the Transco 165/166 facility. The nearby sources are located across Pittsylvania County (VA), Campbell County (VA), Danville City (VA), Halifax County (VA), Franklin County (VA), Martinsville City (VA), and Person County (NC). DEQ asserts that the inventory was appropriate and consistent with EPA guidance on the development of nearby source inventories. The list of sources was included in the applicant's modeling report as well as in the modeling files available for public review. DEQ can provide data in other formats upon request.

Background Concentrations and Monitoring Data

LCS-27 Comment

Commenters stated concerns about the background air monitoring sites and the lack of baseline data available for the Chatham community, which is located in the vicinity of the LCS, for multiple pollutants.

Commenters stated the annual PM-2.5 background concentration used in the modeling was not conservatively representative.

Commenter questioned if the NO_2 background concentrations were included in the total modeled NO_2 concentrations presented. If so, the modeled concentrations without background should be provided.

DEQ 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).

Monitoring sites, in part, are selected based on the review of EPA-recommended criteria such as emissions, population density, traffic and commuting patterns, meteorology (weather/transport patterns), and topography surrounding the project site. Pittsylvania County is not unique with respect to any of these parameters when compared to the existing statewide monitoring networks in Virginia and North Carolina.

Commenters expressed concern about the PM-2.5 background concentrations used in the modeling. The annual background PM-2.5 concentration used in the analysis is 6.9 $\mu g/m^3$. The highest design value concentration in Virginia for the most recent 3-year period of validated data (2017-2019) is 7.7 $\mu g/m^3$ (Arlington, VA). An increase in 0.8$\mu g/m^3$ would not alter the conclusion of modeled NAAQS compliance. The cumulative annual PM-2.5 NAAQS modeling result is 7.9 $\mu g/m^3$ (66% of the NAAQS).

The daily (24-hour) background PM-2.5 concentration used in the analysis was 17 $\mu g/m^3$. The highest design value concentration in Virginia for the most recent 3-year period of validated data (2017-2019) was 21 $\mu g/m^3$ (Frederick County, VA). An increase of 4$\mu g/m^3$ would not alter the conclusion of modeled NAAQS compliance. The cumulative daily PM-2.5 NAAQS modeling result was 23.0 $\mu g/m^3$ (66% of the NAAQS).

Commenters also commented on the selection of the NO_2 background monitor. There are two NO_2 monitors within a 120-kilometer distance from the project site. The nearest NO_2 monitor to the project site is located in Roanoke County, Virginia approximately 69.8 km to the northwest of the project site. The next closest monitor is located approximately 111.8 km from the Project near Winston-Salem, Forsyth County, North Carolina. Winston-Salem, Forsyth County, NC has more than double the NO_X emissions and has much higher population than Roanoke County and Pittsylvania County. Therefore, the NO_2 data from the Winston-Salem site was selected as a conservatively representative and appropriate background monitor to represent background concentrations in Pittsylvania County.

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 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.

1-Hour NO_2 Background Using Season and Hour of Day Approach

LCS-28 Comment

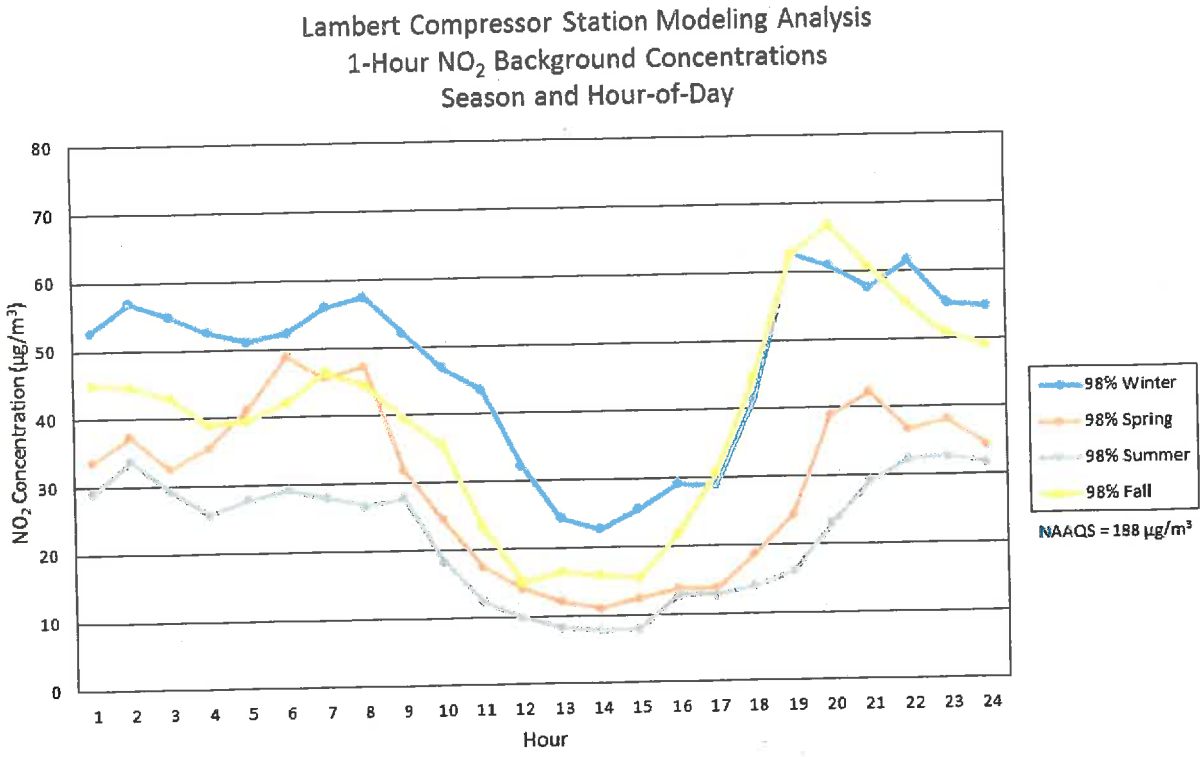
Commenters stated DEQ used an unsupported background concentration of 60.86 $\mu g/m^3$ in the source contribution analysis "not identified as any of the 1-hour NO_2 variable seasonal and hourly background concentration values presented in MVP's June 2020 Modeling Report."

Commenters stated the use of variable background NO_2 monitoring data in the modeling was not justified.

DEQ Response

There is a variety of EPA-approved methods available for combining modeled concentrations with monitored background concentrations to determine the cumulative ambient impact. The "first tier" assumption, or most conservative method, is to add a monitored design value to the modeled concentration to determine the total air quality impact. The design value concentration for the 1-hour NO_2 NAAQS is the 98th percentile hourly concentration averaged over a 3-year period. Use of a single monitored background concentration for all hours of the year is the simplest approach. However, this approach is overly conservative in many cases.

Additional refinements to this "first tier" approach are routinely applied by regulatory agencies. DEQ approved the pairing of modeled and monitored concentrations based on the season and hour of day in order to provide a more appropriate estimate of cumulative impacts rather than use a method that ignores this diurnal pattern. The figure below depicts a clear seasonal and diurnal pattern in the data.



A good understanding of the interdependence between meteorology and pollutant concentrations is necessary to evaluate the effects of one on the other. Specifically, several important relationships support the use of seasonal and diurnal NO_2 background data.

1. NO_2 generally displays a stronger dependence on diurnal sources of emissions (i.e., cars and trucks).

2. Higher NO_2 concentrations can often exist in the fall and winter months. This is attributed to lower seasonal boundary layer heights and subsequently lower wind speeds under these conditions.

3. In the northern hemisphere winter, peak NO_2 concentrations are much higher. This is attributed to both heavier use of combustion power plants for wintertime home heating, as well as the fact that NO_2 stays in the air longer in the winter.

4. The atmospheric lifetime of NO_2 is driven primarily by reactions initiated by sunlight. With less sunlight in the wintertime, reactions that break down NO_2 are not easily initiated and the NO_2 is removed more slowly from the atmosphere.

The largest cumulative modeling results in the LCS modeling analysis generally occur in the fall and winter at night under stable meteorological conditions. These conditions are often associated with light winds and temperature inversions referenced by some commenters. Seasonal and hourly background NO_2 concentrations are also much higher in these circumstances and these concentrations were subsequently added to the cumulative modeled impact to produce the total concentration.

The background concentration contribution to the design value concentration (60.86 $\mu g/m^3$) is calculated based on EPA NO_2 modeling guidance. Specifically, the total modeled concentration, including background, consists of five (5) individual hourly values that are averaged to produce the 1-hour NO_2 design value. This explains why no one individual hourly value in the applicant's modeling report corresponded to the calculated background concentration.

Finally, using an unjustifiably conservative background concentration such as the "first tier" monitored 1-hour NO_2 design value would not change the conclusion that LCS does not cause or contribute to a theoretical NAAQS violation. This is due to the fact that LCS never contributes more than the Significant Impact Level (SIL) of 4 ppb (7.5 $\mu g/m^3$) at any receptor. Further information on the SIL is available in EPA's "General Guidance for Implementing the 1-hour NO_2 National Ambient Air Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim 1-hour NO_2 Significant Impact Level, June 28, 2010".

Modeling Scenarios

LCS-29 Comment

Commenters questioned whether the worst-case emissions from the compressor turbines at Transco 165/166 were included in the 1-hour NO_2 NAAQS analysis conducted for the LCS.

Commenters questioned if the cumulative NAAQS analysis accounted for the variable emissions from the LCS and if the LCS is allowed to pollute above the NAAQS at certain times.

Commenters stated the potential hourly NO_X emissions in startup and shutdown mode from each compressor turbine located at the LCS and Transco 165/166 should be modeled.

Commenters questioned why the model results presented in Tables 4.2 and 4.3 of the MVP modeling report for a pollutant for the different load scenarios, including startup and shutdown, were the same.

Commenters questioned whether leaks were modeled and how they were simulated in the modeling.

DEQ Response

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 included 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, 20°F, 40, 60°F, 80°F, and 100°F ambient temperatures. Intermittent activities (i.e., <0°F) are excluded from the 1-hour NO_2 modeling in accordance with EPA guidance. The worst-case emissions and stack parameters were determined for each turbine load case (50%, 75%, and 100%) for each of the turbines.

Toxic pollutant modeling was performed (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.

All ancillary equipment was included in both criteria and toxic pollutant modeling as appropriate. Fugitive emissions from the compressor station, as provided in the application and to the extent quantifiable, were included in the modeling. Fugitive emissions are defined as those emissions that do not pass through a stack, vent, or other functionally equivalent opening. Fugitive emissions (i.e., VOC emissions which include hexane) at natural gas compressor stations include leaks from piping components (valves, flanges, connectors, and open-ended lines). Fugitive emissions in AERMOD were modeled as volume sources. The volume source is used to represent those type of sources that do not emit through a traditional stack or vent. The emissions release height of each volume source was calculated according to EPA recommended modeling procedures.

The facility is prohibited from violating the NAAQS at any time. The modeling accounted for variable emission rates in the aforementioned modeling scenarios.

Concentrations at varying load conditions do not change the results for criteria pollutants because the overall impact is caused by emissions from Transco 165/166. Variations in the load conditions at the LCS do not affect the *overall maximum results because the LCS does not contribute to those maximum impacts.*

Intermittent Emissions Scenarios

LCS-30 Comment

Commenters requested an explanation of "intermittent source exemption" and its consideration in determining the need to model the sub-zero emissions scenario in the 1-hour NO_2 modeling analysis.

Commenters stated the 1-hour NO_2 modeling needs to reflect NO_X emissions from each compressor turbine located at the LCS and Transco 165/166 when ambient temperatures are lower than 0°F.

DEQ Response

DEQ asserts that 1-hour NO_2 impacts during less than 0°F were properly considered. EPA has published guidance for air quality modeling analyses for demonstrating compliance with the 1-hr NO_2 NAAQS (U.S. Environmental Protection Agency. (EPA 2011) "Additional Clarification Regarding Application of Appendix W, Modeling Guidance for the 1-hour NO_2 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-hour NO_2. 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 NO_2 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 NO_2 standard in such a manner and recommend that compliance demonstrations for the 1-hour NO_2 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."

Based on this guidance, 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 very rare cases and as such would not contribute significantly to the annual distribution of daily maximum 1-hour concentrations of NO_2. A five-year period between 2012 and 2016 at two nearby Automated Surface Observation System (ASOS) sites, the Lynchburg Regional Airport (KLYH, WBAN 13733) and the Danville Regional Airport (KDAN, WBAN 13728), were analyzed for temperatures below 0°F. The ambient temperature was below 0°F for a total of 5 hours at KLYH, and 0 hours at KDAN. All of the hours below 0°F observed at KLYH occurred during the year 2015. Temperatures below 0° F were not recorded during the remaining four years of meteorological data. Since the 1-hour NO_2 NAAQS is based on the 98th percentile (i.e., the eighth highest annually) of the daily maximum concentrations, the frequency of occurrence 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 was not considered in the 1-hour NO_2 NAAQS modeling analysis.

AERMOD 1-Hour NO2 Model Options and Performance

LCS-31 Comment

Commenter questioned the use of EPA's default Ambient Ratio Method 2 instead of assuming 100% conversion of NO_X to NO_2.

Commenter stated the assumptions and methodology used for the modeling should be carefully examined since the modeled concentrations for the NAAQS analysis were "close enough to NAAQS as to warrant further scrutiny".

Commenters stated DEQ has indicated Transco 165/166 is conducting NO_2 ambient air monitoring but there is no data yet available. A commenter requested DEQ study the data when it becomes available "over an extended period of time, and under variable weather conditions in order to properly account for variable pollutant impacts to the community".

DEQ Response

There are several "tiers", or levels of refinement, that are available within the AERMOD model options. The selected tier for regulatory modeling is the lowest tier, or most conservative method, that demonstrates compliance with the NAAQS. The LCS modeling used a Tier 2 approach called ARM2 but additional refinements (i.e., Tier 3) are available and could have been implemented in a case where the Tier 2 modeling failed to demonstrate

compliance with the 1-hour NO_2 NAAQS. ARM2 or Ambient Ratio Method 2 is based on work done in 2015 in which a 10-year record of ambient data from EPA's Air Quality System database was analyzed to characterize typical NO_2/NO_X ambient ratios. The science behind this option is well established and appropriate for use in the LCS modeling analysis.

Recent evaluations of 1-hour NO_2 model performance demonstrate a high degree of conservatism when compared to ambient air measurements. One such study was conducted at a compressor station in Balko, Oklahoma. The purpose of this project was to complete one year of comprehensive field measurements to develop a dataset from a representative compressor station. The study concluded that AERMOD largely over-predicted ambient air monitoring measurements surrounding the facility. The table below illustrates the comparison of the Balko, OK field measurements to AERMOD.

AERMOD 1-Hour NO_2 Model Performance Study
Balko, Oklahoma [1]

Monitoring		AERMOD Modeling Results			
		Tier 1	Tier 2	Tier 3	
Monitor Location	Ambient Air Observed (NO_2 ppb)	Full Conversion (NO_2 ppb)	ARM2 (NO_2 ppb)	OLM (NO_2 ppb)	PVMRM (NO_2 ppb)
Field	32.9	418.0	224.4	190.2	102.6
North Fence	91.1	1015.5	522.6	254.4	192.0
East Fence	18.5	1286.1	657.9	244.2	211.2
Tower	20.2	460.6	245.2	174.8	82.9

[1] Further analysis of Balko, OK Compressor Station 102 and monitoring dataset are available at www.prci.org and at https://gaftp.epa.gov.

Large 1-hour NO_2 AERMOD over predictions are likely the result of several factors. These, include, but are not limited to, simplistic NO_X model chemistry, overestimation of the ratio of NO_2 to NO_X in the stack plume, uniform ozone entrainment assumptions within the plume, building downwash calculations, and the use of 1-hour average meteorological data which does not account for the expected sub-hourly variations in wind speed and wind direction.

Transco 165/166 is currently collecting ambient air measurements in the proximity of the maximum 1-hour NO_2 modeled impact location. The results collected in the first quarter of 2021 illustrate similar findings to the Balko study.

Monitoring		AERMOD Modeling Results
	2021 Quarter 1 Maximum Observed Concentration (NO_2 ppb)	Tier 2
Monitor Location		ARM2 (NO_2 ppb)
Transco 165/166	22.1	95.1 [(1)]

[(1)] 95.1 ppb of NO_2 is equivalent to 178.8 $\mu g/m^3$.

The differences between the modeled and monitored concentrations in this case are largely the result of two factors. The first is that the modeling was conducted using the maximum hourly emissions for all emission units and the monitoring reflects actual facility operations. Most compressor stations only operate at maximum capacity for a very few hours during the year. The second factor is the tendency for AERMOD to over predict 1-hour NO_2 concentrations as previously discussed. Transco 165/166 will be collecting 1-hour NO_2 measurements over the next few years. These data will provide the stakeholders with additional verification that the area remains in compliance with the 1-hour NO_2 NAAQS.

Finally, EPA is currently working on AERMOD NO_2 model improvements. EPA recently released the Generic Reaction Set Method (GSRM) and the Travel Time Reaction Method (TTRM) to address the conversion of NO_x to NO_2, particularly for nearfield locations (i.e. close to the property boundary of a facility). Initial testing of these options indicates better model agreement with observed concentrations. DEQ will provide information to interested stakeholders on these emerging model options as it becomes available in the next several months.

LCS 1-Hour NO_2 Model Contributions at Maximum Impact Location

LCS-32 Comment

Commenters noted how close the proposed LCS would be located to the existing Transco 165/166 and the difference in the contribution of each facility to the 1-hour NO_2

concentration. Commenters were concerned there could be a 1-hour NO_2 NAAQS exceedance if the LCS would approach a contribution similar to the contribution of Transco 165/166.

DEQ Response

The contribution of the LCS at the location of the maximum 1-hour NO_2 impact is much smaller than Transco 165/166 for several reasons. First, the emissions from the LCS are much smaller than Transco 165/166 as illustrated in the following table. Transco 165/166 is a larger compressor station with emissions approximately 12 times LCS emissions. The emissions in the following table represent the worst-case modeled scenario with both facilities operating in startup mode.

Facility	Emission Unit	I.D.	Emissions During Startup Scenario (lb/hr)
Transco 165/166	Clark Engine	ML11	19.2
	Total Emissions from Facility	ALL	53.0
LCS	Mars 100	CT1	2.1
	Total Emissions from Facility	ALL	4.4

Secondly, the largest contributor to the maximum 1-hour NO_2 modeled impact is Unit ML11 (72% of the total maximum-modeled concentration, excluding background). This is not surprising considering the fact that ML11 emissions are approximately 9 times greater than the highest emitting unit at LCS (CT1) during startup. ML11 is also subject to plume downwash since the controlling building (13.7 meters) is taller than the ML11 stack (11.6 meters). The presence of buildings can affect plume rise and the initial dispersion of pollutants within the atmosphere. Turbulence is often present around buildings that force pollutants to the ground instead of allowing them to rise freely within the atmosphere.

Finally, the location of the maximum impact is actually located on the property boundary of Transco 165/166 and is approximately 235 meters from the ML11 stack. Conversely, the locations of the LCS turbines (e.g., CT1) are approximately 780 meters from the maximum receptor. Ambient concentrations generally decrease as you move farther downwind from a stack and the pollution spreads out into a wider more diffused plume.

In summary, these factors explain the much larger modeled impact from Transco 165/166 when compared to the LCS.

Air Toxics Modeling

LCS-33 Comment

Commenters questioned if the air toxics modeling included all of the toxic substances in the discharge plume, including Radon-222, or just the regulated HAPs.

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

Commenters also asserted that DEQ must require a cumulative toxics modeling analysis of the LCS, which includes the existing Transco 165/166 and background concentrations.

DEQ Response

Toxic pollutants were 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 the LCS. One of these HAPs, formaldehyde, exceeded the exemption rates contained in 9VAC5-60-300, requiring BACT and an air quality analysis under the toxics rule. DEQ also requested that the applicant model hexane emissions due to previous interest in blowdown and pigging operations at compressor stations. 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 the LCS demonstrates compliance with the applicable Significant Ambient Air Concentrations (SAACs).

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.

Despite the lack of regulatory basis for cumulative toxics modeling, DEQ did evaluate the combined impacts of Transco 165/166 and the LCS for both hexane and formaldehyde. The combined modeling results are below the SAACs used to demonstrate compliance for individual facilities.

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.

Projected Virginia NOx Reductions

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