



**COMMONWEALTH of VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**PIEDMONT REGIONAL OFFICE**

Molly Joseph Ward  
Secretary of Natural Resources

4949A Cox Road, Glen Allen, Virginia 23060  
(804) 527-5020 Fax (804) 527-5106  
www.deq.virginia.gov

David K. Paylor  
Director

Michael P. Murphy  
Regional Director

**STATEMENT OF LEGAL AND FACTUAL BASIS**

VCU Steam Plant MCV Campus  
Richmond, Virginia  
Permit No. PRO-50126

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, VCU Steam Plant MCV Campus has applied for a renewal of the Title V Operating Permit for its Richmond, Virginia facility. The Department has reviewed the application and has prepared a draft renewal Title V Operating Permit.

Engineer/Permit Contact:

Alison Sinclair  
(804) 527-5155

Date:

8/19/2014

Air Permit Manager:

James E. Kyle, P.E.

Date:

8/19/2014

Deputy Regional Director:

Kyle Ivar Winter, P.E.

Date:

8/19/14

## **FACILITY INFORMATION**

### **Permittee/Facility**

VCU Steam Plant MCV Campus  
1040 Oliver Hill Way  
P.O. Box 980166  
Richmond, VA 23298

County-Plant ID No.: 51-760-0013

**Facility Description:** NAICS 622110 – The facility is a fossil fuel-fired steam generating plant which is operated by Virginia Commonwealth University (VCU) in order to provide steam to various VCU buildings and facilities, including certain buildings at the Medical College of Virginia (a division of VCU). The current equipment consists of three 150.6 MMBtu/hr boilers and associated fuel tanks, and two emergency generators.

The facility is a Title V major source of nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and greenhouse gases (CO<sub>2</sub>-e). This source is located in an attainment area for all pollutants, and is subject to Prevention of Significant Deterioration (PSD) requirements for NO<sub>x</sub>, SO<sub>2</sub> and CO.

## **PERMIT STATUS**

The facility is currently permitted under a PSD Permit issued on March 31, 2003; as amended on December 30, 2004; April 5, 2006; and March 30, 2009. The original Title V permit was issued on May 9, 2001; modified on October 13, 2004; and renewed on June 23, 2009.

The facility is subject to 40 CFR 63 Subpart JJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources, and Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. The facility is also subject to 40 CFR 60 Subpart Db: Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.

The facility submitted a Title V renewal application which was received by DEQ on December 06, 2013 which was in a timely manner and the facility is currently operating under an application shield.

## **COMPLIANCE STATUS**

A full compliance evaluation of this facility, including a site visit, has been conducted. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on these compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

## **CHANGES TO THE PERMIT**

Since the renewal of this Federal Operating Permit on June 23, 2009, there have been no NSR permit actions. The facility, however, is now subject to MACT, Subparts ZZZZ and JJJJJ. Also, the emergency generators are now included in an applicable requirement section. Lastly, some NSPS Db requirements that were in the original Title V permit were inadvertently left out of the subsequent modification and renewal. Those requirements were put back into the permit.

**EMISSION UNITS**

The emissions units at this facility consist of the following:

<b>Emission Unit ID</b>	<b>Stack ID</b>	<b>Emission Unit Description</b>	<b>Size/Rated Capacity*</b>	<b>Pollution Control Device (PCD) Description</b>	<b>PCD ID</b>	<b>Pollutant Controlled</b>	<b>Applicable Permit Date</b>
<b>Fuel Burning Equipment</b>							
BOE-001	BOS-001	Babcock and Wilcox #6 oil/#2 oil/natural gas-fired boiler (1996)	150.6 MMBtu/hr (heat input)	Low NO <sub>x</sub> burner & flue gas recirculation	BOC-001	NO <sub>x</sub>	03/30/09 PSD permit
BOE-002	BOS-002	Babcock and Wilcox #6 oil/#2 oil/natural gas-fired boiler (1996)	150.6 MMBtu/hr (heat input)	Low NO <sub>x</sub> burner & flue gas recirculation	BOC-002	NO <sub>x</sub>	03/30/09 PSD permit
BOE-003	BOS-003	Babcock and Wilcox #6 oil/#2 oil/natural gas-fired boiler (1996)	150.6 MMBtu/hr (heat input)	Low NO <sub>x</sub> burner & flue gas recirculation	BOC-003	NO <sub>x</sub>	03/30/09 PSD permit
<b>Emergency Generators</b>							
GEN-001	GEN-001	Diesel-fired emergency generator	750 kW	None	None	None	None
GEN-002	GEN-002	Diesel-fired emergency generator	750 kW	None	None	None	None

\*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement

**EMISSION INVENTORY**

A copy of the 2013 annual emission update can be obtained from the DEQ Piedmont Regional Office. Emissions are summarized in the following tables.

Emission Unit	2013 Criteria Pollutant Emission in Tons/Year						
	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	NH <sub>3</sub> *
BOE-001	1.25	8.89	0.34	0.72	0.72	5.49	0.28
BOE-002	1.42	10.06	0.09	0.81	0.81	6.48	0.31
BOE-003	1.71	12.15	2.17	0.99	0.99	8.15	0.39
Total	4.38	31.10	2.60	2.52	2.52	20.12	0.97

\* Ammonia (NH<sub>3</sub>) is not a criteria pollutant but rather a precursor and emission data is collected by EPA

Pollutant	2013 Hazardous Air Pollutant Emission in Tons/Yr
Formaldehyde	0.023
Hexane	0.529
Toluene	0.0007
Lead	0.0002

**FUEL BURNING EQUIPMENT APPLICABLE REQUIREMENTS  
BOE-001, BOE-002, BOE-003**

*The source of specific applicable requirements for the boilers is the PSD permit dated March 30, 2009.*

*The boilers were installed in 1996 and are subject to NSPS, Subpart Db.*

*The boilers (BOE-001, BOE-002, BOE-003) are not a major source of HAP and are not subject to the requirements of 40CFR 63 Subpart DDDDD. The boilers will be subject to 40 CFR Subpart JJJJJJ for boilers located at an area source for HAP.*

*CAM is applicable to NO<sub>x</sub> from these units.*

- Condition 2 of the 03/30/09 PSD permit (Condition 1 of the Title V permit) requires that NO<sub>x</sub> emissions be controlled by low NO<sub>x</sub> burners, flue gas recirculation and good operating procedures to meet the lb/MMBtu in Conditions 10 and 11 of the PSD permit (Conditions 7 and 8 of the Title V permit). *This is a PSD BACT determination for controlling NO<sub>x</sub> emissions.*
- Conditions 3 and 8 of the 03/30/09 PSD permit (Condition 2 of the Title V permit) requires that SO<sub>2</sub> emissions be controlled by low-sulfur fuel oil (0.5% S). *This is a PSD BACT determination for controlling SO<sub>2</sub> emissions.*
- Condition 4 of the 03/30/09 PSD permit (Condition 3 of the Title V permit) requires that CO and VOC emissions be controlled by good combustion practices. *This is a PSD BACT determination in part. CO triggered PSD BACT but VOC did not. However good combustion practices can control both.*

- Condition 5 of the 03/30/09 PSD permit (Condition 4 of the Title V permit) approves natural gas, #2 fuel oil, and #6 fuel oil to be burned in the boilers. *Although not designated as a BACT limit, this requirement limits the fuel types in order to ensure compliance with fuel standards.*
- Condition 6 of the 03/30/09 PSD permit (Condition 5 of the Title V permit) limits the annual fuel consumption to 3,500 million cubic feet of natural gas. *This is a PSD BACT determination which can be used to show compliance with the annual emission limits for the boilers.*
- Condition 7 of the 03/30/09 PSD permit (Condition 6 of the Title V permit) limits the amount of fuel oil to be burned in the three boilers. *This is a PSD BACT determination which can be used to show compliance with the annual emission limits for the boilers.*
- Condition 10 of the 03/30/09 PSD permit (Condition 7 of the Title V permit) limits the short term emissions from the boilers, based on fuel. *These are a combination of PSD BACT and NSR BACT determinations and also show compliance with NSPS Subpart Db emission standards (which are less stringent).*
- Condition 11 of the 03/30/09 PSD permit (Condition 8 of the Title V permit) limits NO<sub>x</sub> emissions from each boiler to 0.08 lbs/MMBtu on an annual average, while burning natural gas. *This is a PSD BACT determination which limits NO<sub>x</sub> emissions and shows compliance with NSPS Subpart Db standards (which is less stringent).*
- Condition 12 of the 03/30/09 PSD permit (Condition 9 of the Title V permit) limits annual emissions from all three boilers combined. *These are a combination of PSD BACT (NO<sub>x</sub>, SO<sub>2</sub> and CO) and NSR BACT (PM, PM-10, and VOC) determinations which set emissions limits on the boilers.*
- Condition 13 of the 03/30/09 PSD permit (Condition 10 of the Title V permit) limits visible emissions from the boilers to 10 percent. *This is a PSD BACT determination that ensures the boilers are operating correctly. It is more stringent than the NSPS Subpart Db standard of 20 percent.*
- Condition 9 of the 03/30/09 PSD permit (Condition 11 of the Title V permit) requires the boilers to be operated in accordance with NSPS Subpart Db. *This is a PSD BACT determination and is also subject to EPA Standards of Performance for New Stationary Sources (9 VAC 5-50-410) for the NSPS standards.*
- Condition 12 of the Title V permit requires the permittee to conduct biennial boiler tune-ups. *This is a requirement of 40 CFR 63, Subpart JJJJJ which ensures the boilers are operating at an optimum level. Enforcement of this MACT subpart has not been delegated to Virginia but is a federal requirement.*
- Condition 14 of the 03/30/09 PSD permit (Condition 13 of the Title V permit) requires CEMs to be installed to measure NO<sub>x</sub> emissions from the boilers. *This is a PSD general requirement and also fulfills a NSPS Subpart Db requirement through 9 VAC 5-50-410 of Virginia regulations and fulfills the requirement for CAM.*
- Condition 15 of the 03/30/09 PSD permit (Condition 14 of the Title V permit) allows CEM data to be used to show a violation of emission standards. *This is a PSD general requirement and fulfills the requirement for CAM.*
- Condition 17 of the 03/30/09 PSD permit (Condition 15 of the Title V permit) requires the NO<sub>x</sub> CEM and COM to meet a minimum data availability of 90 percent of boiler operating hours. *This is a PSD general requirement to ensure most of the monitoring data is collected for analysis. This fulfills the requirement for CAM.*
- Condition 18 of the 03/30/09 PSD permit (Condition 16 of the Title V permit) requires the permittee to sample the #6 oil tank daily for sulfur and heat content, or sample it each time the tank is refilled. *This is a PSD general requirement that ensures compliance with Conditions 3 and 8 of the PSD permit (Condition 2 of the Title V permit). This fulfills the requirement for CAM.*

- Condition 19 of the 03/30/09 PSD permit (Condition 17 of the Title V permit) requires fuel certification for #2 oil deliveries. *This is a PSD general requirement and fulfills the NSPS Subpart Db requirement, although not cited in the underlying permit.*
- Condition 22 of the 03/30/09 PSD permit (Condition 18 of the Title V permit) requires the permittee to maintain records that demonstrate compliance with the permit. *This is a PSD general requirement with Special Provisions of the Virginia State Regulations and requirements from NSPS Subpart Db that do not appear in the underlying PSD permit, such as daily fuel records, calculation of annual fuel capacity factors, and NOx monitoring.*
- Condition 20 of the 03/30/09 PSD permit (Conditions 19 and 20 of the Title V permit) requires the facility be constructed to accommodate testing and, if testing is conducted, to use the appropriate test methods approved by DEQ. *This requirement is from the Special Provisions of the Virginia State Regulations.*
- Condition 21 of the Title V permit requires a Compliance Certification report to be submitted to EPA for biennial tune-ups. *This is a MACT Subpart JJJJJ requirement which ensures the boilers are operating at an optimum level. Compliance for this MACT subpart has not been delegated to Virginia but is a federal requirement.*
- Condition 21 of the 03/30/09 PSD permit (Condition 22 of the Title V permit) requires the permittee to submit fuel quality reports on a semi-annual basis. *This is a PSD general requirement to show compliance with Condition 19 of the PSD permit (Condition 17 of the Title V permit).*
- Condition 16 of the 03/30/09 PSD permit (Condition 23 of the Title V permit) requires the source to submit quarterly reports as per NSPS Subpart Db. *This is a PSD general requirement and is based on 9 VAC 5-50-410 of the Virginia Regulations which incorporates federal requirements.*

#### **Streamlined Requirements**

Conditions 3 and 8 of the 03/30/09 PSD permit both limit fuel sulfur content of the fuel oil to 0.5 percent sulfur. These conditions were combined into Condition 2 of the Title V permit.

**The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:**

9 VAC 5-50-50: Special Provisions for New and Modified Stationary Sources

9 VAC 5-50-260: Standards for stationary sources

9 VAC 5-50-280: Standards for major stationary stationary sources (PSD area)

9 VAC 5-80-280: Operational flexibility within the Standards for major stationary sources (PSD)

9 VAC 5-50-410: EPA Standards of Performance for New Stationary Sources

### **FUEL BURNING EQUIPMENT APPLICABLE REQUIREMENTS**

#### **Emergency Generators (GEN-001, GEN-002)**

*These emergency units are not subject to minor NSR permitting so there are no underlying permit conditions. The units are subject to MACT Subpart ZZZZ, however enforcement for this MACT subpart has not been delegated to Virginia for area sources but is a federal requirement. Following are applicable requirements from the Virginia State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution:*

- Condition 24 of the Title V permit acknowledges that the engines are designed to use #2 oil, for which certain requirements of MACT ZZZZ are applicable. *This requirement will define the fuel type of the units for MACT applicability.*

- Condition 25 of the Title V permit limits the emergency generators to operate according to the requirements for emergency engines in MACT ZZZZ and to install a non-resettable hour meter. *This requirement will make sure the engines are not operated as non-emergency units. The hour meter will track operating hours for applicability to maintenance requirements.*
- Conditions 26, 27, 28, and 29 of the Title V permit list the MACT, Subpart ZZZZ emission limits, monitoring, maintenance, and reporting requirements that are applicable to the generators. *The source is aware of all specific applicable requirements of MACT Subpart ZZZZ and will submit documentation accordingly to show compliance. Copies of the regulations will be attached to the Title V permit.*
- Condition 30 of the Title V permit limits visible emissions from the generators (GEN-001, GEN-002) to no more than 20 percent opacity except during one six minute-period in any one hour in which visible emissions shall not exceed 30 percent opacity. *9 VAC 5-50-80 Standard for Visible Emissions for New and Modified Stationary Sources which ensures units are working properly.*
- Condition 31 of the Title V permit requires the permittee to perform quarterly visible emission checks to show compliance with opacity limits for the diesel generators (GEN-001, GEN-002). "Normal" visible emissions shall be those which are observed on a frequent basis. A Method 9 VEE will be required if visible emissions appear to be above normal. *This condition fulfills the monitoring requirement of Part 70 to ensure compliance with Condition 30 of the Title V permit.*
- Condition 32 of the Title V permit requires the permittee to keep a log of the hours of non-emergency operation of each generator on a monthly basis. *This requirement provides for monitoring to show compliance with Condition 25 of the Title V permit.*
- Condition 33 of the Title V permit requires the permittee to maintain records necessary to demonstrate compliance with the requirements of the emergency generators (GEN-001, GEN-002). *9 VAC 5-50-50 Standards of Performance for Stationary Sources – Notification, records and reporting.*
- Condition 34 of the Title V permit requires the permittee to use appropriate testing methods if testing is being conducted on the generators. *9 VAC 5-50-30 Special Provisions for New and Modified Stationary Sources – Performance Testing.*

### **Streamlined Requirements**

There are no streamlined conditions for these units

**The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:**

9 VAC 5-50-50: Special Provisions for New and Modified Stationary Sources

9 VAC 5-50-80: Standards of Performance for Stationary Sources- Standard for Visible Emissions

## **EMISSION UNIT APPLICABLE REQUIREMENTS**

### **Facility Wide Conditions**

Condition 26 of the 03/30/09 PSD permit (Condition 35 of the Title V permit) requires the source to develop a maintenance schedule for its equipment. *This requirement is a general PSD requirement and is based on 9 VAC 5-50-20 E which ensures the equipment is maintained in good operating condition in order to minimize emissions.*

Condition 27 of the 03/30/09 PSD permit (Condition 36 of the Title V permit) requires the source to have written operating procedures available to trained operators. *This requirement is a general PSD requirement and is based on 9 VAC 5-50-20 E which allows review of such procedures to determine whether good operating procedures are being followed.*

### **Streamlined Requirements**

Condition 23 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 60.  
Condition 24 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 55.  
Condition 25 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 44.  
Condition 28 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 58.  
Condition 29 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 50  
Condition 30 of the 03/30/09 PSD permit is a general NSR requirement that is duplicated in General Condition 57

**The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:**

9 VAC 5-50-20: Special Provisions for New and Modified Stationary Sources - Compliance

### **GENERAL CONDITIONS**

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

#### **Comments on General Conditions**

##### **40. Permit Expiration**

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit applications has been delegated to the Regions as allowed by §§2.2-604 and §10.1-1185 of the *Code of Virginia*, and the "Department of Environmental Quality Agency Policy Statement No. 2-09."

This general condition cites the entire Article that follows:

Article I (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Operating Permits for Stationary Sources

This general condition cites the sections that follow:

- 9 VAC 5-80-80. Application
- 9 VAC 5-80-140. Permit Shield
- 9 VAC 5-80-150. Action on Permit Applications

##### **44. Failure/Malfunction Reporting**

Section 9 VAC 5-20-180 requires malfunction and excesses emissions reporting within four hours of discovery. Section 9 VAC 5-80-250 also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to this section including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of the malfunction.

In order for emission units to be relieved from the requirement to make a written report in 14 days, the emission units must have continuous monitors and the continuous monitors must meet the requirements of 9 VAC 5-50-410 or 9 VAC 5-40-41.

This general condition cites the sections that follow:

- 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources

9 VAC 5-40-50. Notification, Records and Reporting

9 VAC 5-50-50. Notification, Records and Reporting

#### **48. Permit Modification**

This general condition cites the sections that follow:

9 VAC 5-80-50. Applicability, Federal Operating Permit for Stationary Sources

9 VAC 5-80-190. Changes to Permits

9 VAC 5-80-260. Enforcement

9 VAC 5-80-1100. Applicability, Permits for New and Modified Stationary Sources

9 VAC-5-80-1605. Applicability, Permits for Major Stationary Sources and Modifications Located in Prevention of Significant Deterioration Areas

#### **59. Malfunction as an Affirmative Defense**

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in section 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition 63 and General Condition 48. For further explanation see the comments on General Condition 48.

This general condition cites the sections that follow:

9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

9 VAC 5-80-110. Permit Content

#### **63. Asbestos Requirements**

The Virginia Department of Labor and Industry under Section 40.1-51.20 of the Code of Virginia also holds authority to enforce 40 CFR 61 Subpart M, National Emission Standards for Asbestos.

This general condition contains a citation from the Code of Federal Regulations that follow:

40 CFR 61.145, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to demolition and renovation.

40 CFR 61.148, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to insulating materials.

40 CFR 61.150, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to waste disposal.

This general condition cites the regulatory sections that follow:

9 VAC 5-60-70. Designated Emissions Standards

9 VAC 5-80-110. Permit Content

### **STATE ONLY APPLICABLE REQUIREMENTS**

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have not been included in the Federal Operating Permit (as noted in Condition 67 of the Title V permit):

9 VAC 5-40-20.A.3 Compliance (with opacity standards except during startup, shutdown, and malfunction);

9 VAC 5-50-310, Odorous Emissions

9 VAC 5-60-320, Toxic Pollutants

### **FUTURE APPLICABLE REQUIREMENTS**

None.

## **INAPPLICABLE REQUIREMENTS**

Condition 38 of the Title V permit lists reasons that some of the source types are not subject to applicable requirements that would appear to be applicable.

CO<sub>2</sub>-e emissions are above permitting levels for the Greenhouse Gas Tailoring Rule under PSD regulations, but, as of January 2, 2011, no modification has taken place to trigger PSD permitting for CO<sub>2</sub>-e at this facility.

## **COMPLIANCE PLAN**

There is no compliance plan for this facility.

## **INSIGNIFICANT EMISSION UNITS**

Condition 37 of the Title V permit lists the insignificant emission units identified at this facility. The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

The citation criteria for insignificant activities are as follows:

- 9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
- 9 VAC 5-80-720 B - Insignificant due to emission levels
- 9 VAC 5-80-720 C - Insignificant due to size or production rate

## **CONFIDENTIAL INFORMATION**

The permittee submitted a showing for confidentiality but the underlying NSR permits do not contain confidential information. A non-confidential permit application was submitted and all portions of the Title V application are suitable for public review.

## **PUBLIC PARTICIPATION**

The draft permit went to public notice in Style Weekly on July 2, 2014. The public notice period expired on August 1, 2014. The draft permit was also submitted to EPA on July 1, 2014 for a concurrent 45-day review that expired on August 18, 2014. DEQ did not receive any comments about the draft permit during the review period.