December 15, 2020

Tashni-Ann Dubroy, Ph.D.

Executive Vice President and COO

Howard University

2400 6th Street, NW

Suite 428

Washington, DC 20059

**RE: Permit No. 7287 to Construct and Operate a Combined Heat and Power Plant**

Dear Dr. Dubroy:

Pursuant to sections 200.1 and 200.2 of Title 20 of the District of Columbia Municipal Regulations (20 DCMR), a permit from the Department of Energy and Environment (“the Department”) shall be obtained before any person can construct, modify, or operate a stationary source in the District of Columbia. The application of Howard University (“Permittee”) to construct and operate a combined heat and power (CHP) plant with a 69.51 MMBtu/hr natural gas-fired combustion turbine generator (6.5 MWe) with a heat recovery steam generator with 26.5 MMBtu/hr natural gas-fired rated duct burner, at 2240 6th Street NW, Washington, DC has been reviewed. Based on the plans and specifications as detailed in the air permit applications dated June 27, 2020 and additional emission calculation corrections received on July 23, 2020, the applications are hereby approved, and the operation of the CHP plant are permitted, subject to the following conditions:

I. General Requirements:

a. This approval is issued pursuant to the air pollution control requirements of the applicable sections of 20 DCMR for the construction and operation of the CHP plant.

b. This permit expires on December 14, 2025 [20 DCMR 200.4]. If continued operation after this date is desired, the Permittee shall submit an application for renewal by September 14, 2025.

c. Construction, modification, or operation of equipment under the authority of this permit shall be considered acceptance of its terms and conditions.

1. The Permittee shall allow authorized officials of the District, upon presentation of identification, to:

1. Enter upon the Permittee’s premises where a source or emission unit is located, an emissions related activity is conducted, or where records required by this permit are kept;

2. Have access to and copy, at reasonable times, any records that must be kept under the terms and conditions of this permit;

3. Inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor, at reasonable times, any substance or parameter for the purpose of assuring compliance with this permit or any applicable requirement.

e. This permit shall be kept on the premises and produced upon request.

f. Failure to comply with the provisions of this permit may be grounds for suspension or revocation. [20 DCMR 202.2]

g. The Permittee shall submit a complete application to modify the facility’s Title V operating permit to include the requirements of this permit within 12 months of the date that the unit commences operation [20 DCMR 301.1(a)(3)].

II. Emission Limitations:

a. The CHP plant shall not emit pollutants in excess of the following [20 DCMR 201]:

|  |  |
| --- | --- |
| **Pollutant** | **Emission Limits (lb/MMscf)** |
| Oxides of Nitrogen (NOx) | 7.67 |
| Carbon Monoxide (CO) | 9.34 |
| Volatile Organic Compounds (VOC)  | 3.34 |
| Total Particulate Matter [PM(total)]† | 14.08 |

 † PM Total includes both filterable and condensable fractions.

*Note that the PM limit is a streamlined requirement. The requirements of 20 DCMR 201 are more stringent than the requirements of 20 DCMR 600.1. Compliance with this condition will ensure compliance with both requirements.*

b. Visible emissions shall not be emitted into the outdoor atmosphere from the CHP plant, except that discharges not exceeding forty percent (40%) opacity (unaveraged) shall be permitted for two (2) minutes in any sixty (60) minute period and for an aggregate of twelve (12) minutes in any twenty-four hour (24 hr.) period during start-up, cleaning, adjustment of combustion controls, or malfunction of the equipment [20 DCMR 606.1]

*Note that 20 DCMR 606 is subject to an EPA-issued call for a State Implementation Plan (SIP) revision (known as a “SIP call”) requiring the District to revise 20 DCMR 606. See “State Implementation Plans: Response to Petition for Rulemaking; Restatement and Update of EPA’s SSM Policy Applicable to SIPs; Findings of Substantial Inadequacy; and SIP Calls To Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown and Malfunction”, 80 Fed. Reg. 33840 (June 12, 2015). It is likely that this federal action will result in changes to the requirements of 20 DCMR 606. Any such changes, once finalized in the DCMR, will supersede the language of Condition II(b) as stated above.*

1. The Permittee shall not burn in the unit any fuel that contains total potential sulfur emissions in excess of 0.060 lb SO2/MMBtu heat input. [40 CFR 60.4330(a)(2)]
2. NOx emissions from the CHP plant shall not exceed 2 ppmvd corrected to 15% oxygen (O2) as determined by testing performed pursuant to Condition IV(d). [40 CFR 60.4320, 20 DCMR 201, and 20 DCMR 805.4 (a)(1)(A)(i)] *Note that this is a streamlined emission rate limit, and is more stringent than the limits found in 40 CFR 60, Subpart KKKK and 20 DCMR 805.4 for NOx emissions cited above. Compliance with this condition will ensure compliance with all three requirements.*
3. An emission into the atmosphere of odorous or other air pollutants from any source in any quantity and of any characteristic, and duration which is, or is likely to be injurious to the public health or welfare, or which interferes with the reasonable enjoyment of life or property is prohibited. [20 DCMR 903.1]

III. Operational Limitations:

a. The sole allowable fuel for the CHP plant is natural gas with a sulfur content of 20 grains of sulfur or less per 100 standard cubic feet. [20 DCMR 201 and 40 CFR 60.4365(a)]

* 1.

b. The Permittee shall install and maintain a totalizing natural gas fuel meter on the CHP plant to track natural gas usage. [20 DCMR 201]

c. All electricity produced by the combustion turbine generator shall be used by the Permittee and shall not be sold.

d. At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall, to the extent practicable, maintain and operate the unit in a manner consistent with good air pollution control practice for minimizing emissions at all times including startup, shutdown, and malfunction. Determination of whether acceptable operating procedures are being used will be based on information available to the Department which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. [40 CFR 60.4333(a) and 20 DCMR 201]

e. In order to comply with Condition III(d), the equipment shall be maintained in accordance with one of the following [20 DCMR 805.4(a)(8)]:

1. The manufacturer’s emission-related written instructions; or

2. An alternate written maintenance plan approved in writing by the Department.

IV. Monitoring and Testing Requirements:

1. The Permittee shall conduct Department-approved source compliance tests for NOx in accordance with 40 CFR 60.8 and 40 CFR 60.4400, on the CHP plant to demonstrate compliance with the NOx emissions limitations contained in Conditions II(a) and (d). These tests shall be performed in accordance with the following schedule [20 DCMR 502, 20 DCMR 805.4(b)(2), 40 CFR 60.8, 40 CFR 60.4340, and 40 CFR 60.4400]:

1. Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup, an initial performance test shall be conducted;

2. Except as specified in Condition IV(a)(3), subsequent performance tests shall be performed on an annual basis, no sooner than 9 months and no later than 14 months after the previous performance test was performed;

3. If the NOx emission result from the most recent performance test was less than or equal to 75 percent of the NOx emission limit for the turbine, the Permittee may reduce the frequency of the subsequent performance tests to once every two years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NOx emission limit for the turbine, the Permittee must resume annual performance tests in accordance with Condition IV(a)(2).

1. The sample port design and locations shall be approved by the Department prior to installation. [20 DCMR 502]
2. Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the CHP plant, and at least once every five years thereafter, the Permittee shall perform testing using methods approved in advance by the Department to determine compliance with the remaining emission limits contained in Condition II(a) of this permit. If the testing performed to meet the 180 day deadline is determined, by the Department, not to be representative of maximum operations due to delays in full startup, the Department may require additional testing at a time following completion of startup to ensure that representative testing is performed.
3. Performance tests conducted pursuant to Conditions IV(a) and (c) shall be conducted under such conditions as approved by the Department, and for Condition IV(a) testing, EPA, via the test protocol required pursuant to Condition IV(e) and shall be based on representative performance of the equipment. Additionally [40 CFR 60.8(c), 40 CFR 60.4400(b), 20 DCMR 201, 20 DCMR 502]:

1. The Permittee shall make available to the Department such records as may be necessary to determine the conditions of the performance tests;

2. Operations during periods of startup[[1]](#footnote-1), shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test, nor shall emissions in excess of the level of the applicable emission limit during periods of startup or shutdown be considered a violation of the applicable emission limit unless resulting from noncompliance with Condition III(d);

3. The performance test must be done at any load condition within plus or minus 25 percent of 100 percent of peak load. The Permittee may perform testing at the highest achievable load point, if at least 75 percent of peak load cannot be achieved in practice (this will likely result in reopening of the permit to establish this highest achievable load point as a limit in the permit);

4. The Permittee must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes;

5. The Permittee must measure the total NOx emissions after the duct burner rather than directly after the turbine. The duct burner must be in operation during the performance test;

6. Compliance with the applicable emission limits must be demonstrated at each tested load level. Compliance is achieved if the three-run arithmetic average NOx emission rate at each tested level meets the applicable emission limit; and

7. The ambient temperature must be greater than 0 °F during the performance test.

1. The Permittee shall obtain approval of a protocol for the testing required by Conditions IV(a), (c), and (i) this permit and furnish the Department and EPA with a written report of the results of the performance tests and/or compliance tests in accordance with the following requirements [20 DCMR 502]:

1. Test protocols shall be submitted a minimum of thirty (30) days in advance of the proposed test date as follows. The testing shall be conducted in accordance with Federal and District requirements.

A. For testing pursuant to Condition IV(a), the protocol shall clearly denote that 40 CFR 60, Subpart KKKK NOx testing is a part of the testing program and specifically request approval of the protocol from EPA as well as the Department. The test protocols shall be submitted as follows:

i. One (1) original and one (1) copy of the test protocol shall be submitted to the following address [40 CFR 60.4(a)]:

Director, Air Protection Division

Mail Code 3AP00

1650 Arch Street

Philadelphia PA 19103-2029

ii. One (1) copy of the test protocol shall be submitted to the following address:

Chief, Compliance and Enforcement Branch

Department of Energy and Environment

Air Quality Division

1200 First Street NE, 5th Floor

Washington DC 20002

and;

iii. An electronic copy of the test protocol shall be submitted to the following address:

air.quality@dc.gov

B. For testing pursuant to Conditions IV(c) and (i), the Permittee shall request approval of the protocols from the Department and submit the test protocols to the following:

i. One (1) original test protocol shall be submitted to the following address:

Chief, Compliance and Enforcement Branch

Department of Energy and Environment

Air Quality Division

1200 First Street NE, 5th Floor

Washington DC 20002

and;

ii. An electronic copy of the test protocol shall be submitted to the following address:

air.quality@dc.gov

2. The test protocol and test date(s) shall be approved by the Department and, for testing pursuant to Condition IV(a), EPA, prior to initiating any testing. The Department and, for Condition IV(a) testing, EPA, must have the opportunity to observe the test for the results to be considered for acceptance.

3. The final results of the testing shall be submitted to the Department and EPA within sixty (60) days of the test completion as follows:

A. For Condition IV(a) testing, test reports shall be submitted in the same numbers and to the same addresses as specified for test protocols in Condition IV(e)(1)(A); and

B. For Condition IV(c) and (i) testing, test reports shall be submitted in the same numbers and to the same addresses as specified for test protocols in Condition IV(e)(1)(B).

4. If after 30 days notice for an initially scheduled performance test, there is a delay (due to operational problems, etc.) in conducting the scheduled performance test, the Permittee shall notify the EPA Administrator (for Condition IV(a) testing only) and the Department (for all testing) as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with the EPA Administrator (for Condition IV(a) testing) and the Department (for all testing) by mutual agreement. [40 CFR 60.6(d)] *Note that rescheduling under this condition does not extend any deadline for completion of the testing contained in this permit document.*

5. The final reports of the results shall include the emissions test report (including raw data from the test) as well as a summary of the test results and a statement of compliance or non-compliance with Conditions II(a) and, when relevant, II(d) to be considered valid. The summary of results and statement of compliance or non-compliance shall contain the following information:

A. A statement that the Permittee has reviewed the report from the emissions testing firm and agrees with the findings;

B. Permit number(s) and condition(s) which are the basis for the compliance evaluation;

C. Summary of results with respect to the permit condition; and

D. Statement of compliance or non-compliance with Conditions II(a) and, where applicable, II(d).

6. The results must demonstrate to the Department’s and, for Condition IV(a) testing, EPA’s satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the Permittee shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.

1. The Permittee shall monitor the total sulfur content of the natural gas being fired in the turbine, except as provided in Condition IV(f)(1). The sulfur content of the fuel must be determined using the total sulfur methods described in 40 CFR 60.4415. Alternatively, if the total sulfur content of the natural gas during the most recent performance test was less than half the limit specified in Condition III(a), ASTM D4084, D4810, D5504, or D6228, or Gas Processors Association Standard 2377, which measure the major sulfur compounds, may be used. [40 CFR 60.4360].

1. The Permittee may elect not to monitor the total sulfur content of the fuel combusted in the turbine if the fuel is demonstrated not to exceed potential sulfur emissions of 0.060 lb SO2/MMBtu heat input. The Permittee shall use one of the following sources of information to make the required demonstration [40 CFR 60.4365]:

A. 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 is 20 grains of sulfur or less per 100 standard cubic feet or that the fuel has potential sulfur emissions of less than 0.060 lb SO2/MMBtu heat input; or

B. Representative fuel sampling data which show that the sulfur content of the fuel does not exceed 0.060 lb SO2/MMBtu heat input. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D of 40 CFR 75 is required.

g. At least once per calendar quarter, during operation of the CHP plant, the Permittee shall conduct visual observations of the emissions from the CHP plant. If no operations of the CHP plant are occurring during a given quarter, this shall be so noted. If emissions are visible, the Permittee shall make arrangements for prompt visible emissions testing by a person certified in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A). Such a test shall consist of a minimum of 30 minutes of opacity observations for the CHP plant and shall be performed when operating conditions are similar to when the visible emissions were observed (including whether or not duct burners are in operation).

h. Regardless of whether or not emissions are observed pursuant to Condition IV(g) of this permit, the Permittee shall conduct a minimum of one visible emissions test of the CHP plant, with the duct burners operating, each year in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A). Such a test program shall consist of a minimum of 30 minutes of opacity observations of the CHP plant and shall be performed by a person certified in accordance with EPA Reference Method 9.

i. The Permittee shall conduct and allow the Department access to conduct tests of air pollution emissions from any source as requested. [20 DCMR 502.1]

j. The Permittee shall continuously monitor the following parameters to verify the proper operation of the emission control system:

1. For the SCR system, urea injection is initiated when the flue gas entering the SCR system reaches 350 °F and continues as long as the temperature is between 350 °F and 775 °F. To ensure proper operation of the SCR system, the Permittee shall continuously monitor the following during operation of the equipment:

A. The temperature of the flue gas entering the SCR system;

B. The times of combustion turbine operation; and

C. The times of active urea injection;

2. For the CO catalyst system, proper operation of the catalyst occurs between 650 °F and 1200 °F and the expected life of the catalyst is approximately 7 years. To ensure proper operation of the CO catalyst system, the Permittee shall perform the following monitoring:

A. The temperature of the flue gas entering the CO catalyst shall be continuously monitored; and

B. Once per calendar year a sample (“plug”) of the catalyst bed shall be removed and analyzed by a qualified laboratory to determine the effectiveness of the catalyst and whether or not it needs to be replaced. Once removed for sampling, the plug shall be replaced to maintain the integrity of the catalyst bed.

V. Record Keeping Requirements:

The Permittee shall maintain the following records for a period of not less than five (5) years from the date of each test, monitoring, sample measurement, report, application, or other activity (except where a longer period is specified below): [20 DCMR 302.1(c)(2)(B) and 20 DCMR 500.8]

a. The Permittee shall maintain records of all visible emissions monitoring performed pursuant to Condition IV(g). These records shall include the identity of the person performing the monitoring as well as their initials or signature indicating his/her certification of the accuracy of the observations;

b. The Permittee shall maintain records of all Method 9 visible emissions testing performed pursuant to Conditions IV(g) and (h). These records shall also include the identity of the person performing the visible emissions testing and documentation of his/her Method 9 certification. These records shall include documentation indicating whether the results show compliance with Condition II(b);

1. Each month, the Permittee shall record the amount of natural gas burned in the CHP plant during the previous month. These data shall be maintained for a period of not less than five (5) years and shall also be kept in a calendar year sum format [20 DCMR 500.8];
2. The Permittee shall maintain records of the results of all testing required pursuant to Conditions IV(a), (c), and (i);
3. The Permittee shall maintain records of the results of all natural gas sulfur content monitoring, testing, and/or supplier documentation required pursuant to Condition IV(f);
4. The Permittee shall maintain records of total emissions of each pollutant covered by Condition II(a) from the CHP plant, kept in calendar year sum format;
5. The Permittee shall maintain records of all maintenance (both scheduled and unscheduled) performed on the unit;
6. The Permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the equipment [40 CFR 60.7(b)];
7. The Permittee shall maintain records of the actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process, air pollution control, and monitoring equipment to its normal or usual manner of operation;
8. The Permittee shall maintain copies of all documentation associated with any exceedances of Condition II(e) of this permit;

k. The Permittee shall maintain a copy of the CHP plant, SCR system, and CO catalyst manufacturers’ maintenance and operating recommendations at the facility for the duration of the existence of the CHP plant at the facility pursuant to Condition III(e)(1);

l. The Permittee shall maintain a copy of any alternate maintenance plan approved by the Department (and records of the approval) pursuant to Condition III(e)(2) for the duration of the effectiveness of such plan plus five years after the plan is replaced or revised; and

m. The Permittee shall, by March 1 of each year, calculate total emissions of the pollutants listed below from the CHP plant system during the previous calendar year:

1. Oxides of nitrogen (NOx);

2. Sulfur dioxide (SO2);

3. Carbon monoxide (CO);

4. Volatile organic compounds (VOCs);

5. Lead (Pb) and lead compounds, as defined in 40 CFR 50.12;

6. Ammonia (NH3);

7. Particulate matter in each of the following categories:

A. Total particulate matter (total filterable plus condensable),

B. Total particulate matter less than 10 microns in aerodynamic diameter (PM10, also known as PM10-PRI), equivalent to PM10-FIL plus PM-CON,

C. Condensable particulate matter (PM-CON),

D. Filterable particulate matter less than 10 microns in aerodynamic diameter (PM10-FIL),

E. Total particulate matter less than 2.5 microns in aerodynamic diameter (PM2.5, also known as PM2.5-PRI), equivalent to PM2.5-FIL plus PM-CON, and

F. Filterable particulate matter less than 2.5 microns in aerodynamic diameter (PM2.5-FIL); and

8. All hazardous air pollutants (HAPs) as defined in §112(b) of the Clean Air Act, as revised;

n. The Permittee shall maintain records of the data monitored and CO catalyst sample results obtained pursuant to Condition IV(j) and shall provide analyses of those data to the Department or EPA upon request and in accordance with Condition VI(c). These records shall include analyses of the time it takes from initiation of operation of the equipment to the time urea injection begins.

VI. Reporting Requirements:

a. The Permittee shall furnish EPA and the Department, written notifications as follows [40 CFR 60.7(a)]:

1. A notification of the date construction of the equipment is commenced, postmarked no later than 30 days after such date. This requirement shall not apply in the case of mass-produced facilities which are purchased in completed form; and

2. A notification of the actual date of initial startup of the equipment, postmarked within 15 days after such date. This date shall be considered the date the unit commenced operation for purposes of Condition I(g).

3. These notifications shall be submitted to the following addresses:

Chief, Compliance and Enforcement Branch

Air Quality Division

1200 First Street NE, 5th Floor

Washington, DC 20002

and

Director, Air Protection Division

Mail Code 3AP00

1650 Arch Street

Philadelphia PA 19103-2029

b. A report of the calculations performed pursuant to Condition V(m) shall be submitted to the Department with the Annual Title V compliance certification report due each year for the previous calendar year. [20 DCMR 500.1]

c. The Permittee shall submit, with the Annual Title V compliance certification report, a report on the operation of the SCR system and the CO catalyst system, which shall include the following:

1. The number of startups of the system over the year;

2. The average amount of time from initiation of operation during each startup to the beginning of urea injection;

3. An explanation of the variation in duration of these startup periods, including any outliers that took substantially longer than average to reach urea injection temperature and the beginning of urea injection; and

4. The results of the annual CO catalyst sampling and analysis required pursuant to Condition IV(j)(2)(B).

d. The Permittee shall include the equipment covered by this permit document in all reports required by the Title V permit for the facility, including, but not limited to, semi-annual and annual compliance certifications and reports, wherein the Permittee shall certify compliance or non-compliance with the conditions of this permit document for the covered equipment.

If you have any questions, please call me at (202) 535-1747 or Thomas Olmstead at (202) 535-2273.

Sincerely,

Stephen S. Ours, P.E.

Chief, Permitting Branch

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1. “Startup” means the setting in operation of an affected facility for any purpose. [40 CFR 60.2] For purposes of this equipment, the startup period ends when the unit has reached a high enough temperature to operate the selective catalytic reduction (SCR) system and the CO catalyst. [↑](#footnote-ref-1)