

**GOVERNMENT OF THE DISTRICT OF COLUMBIA**  
Department of Energy and Environment

**CHAPTER 2 TECHNICAL MEMORANDUM**

**TO:** Stephen S. Ours, P.E.  
Chief, Permitting Branch

**FROM:** John C. Nwoke  
Environmental Engineer

**SUBJECT:** **United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Natural Gas-Fired**  
**Microturbines at 1849 C Street NW Washington, DC**

**DATE:** August 16, 2022

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**BACKGROUND INFORMATION**

On December 7, 2021, the Air Quality Division (AQD) received a set of Chapter 2 permit renewal applications for the continued operation of the two natural gas-fired microturbines at the U.S. Department of the Interior, Main Interior Building, 1849 C Street NW.

It should be noted that the applications to operate two natural gas-fired microturbines were submitted along with applications to operate five boilers. These were originally considered part of the same construction project but are being addressed in a separate permitting action. The facility also has two emergency generator sets being addressed pursuant to source category permit coverage applications.

The publication of this permit action is planned for August 26, 2022, in the D.C. Register. Public comment for the permit action will be solicited through September 26, 2022.

The United States Department of the Interior has not requested that any aspects of the application be held confidential.

**TECHNICAL INFORMATION**

The Capstone microturbines are rated at 2.28 MMBTU/hr. heat input (200 kWe) and 9.12 MMBTU/hr. heat input (800 kWe), respectively and fire only natural gas. More detailed technical information is included with the permit applications.

**EMISSION EVALUATION**

DOI estimated the maximum annual emissions from each of the microturbines to be as shown in the following table:

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**  
**United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Microturbines**  
August 16, 2022  
Page 2

<b>Pollutant</b>	<b>Maximum Annual Emissions (tons/year)</b>	
	<b>Model C200</b>	<b>Model C800</b>
Carbon Monoxide (CO)	0.96	3.85
Oxides of Nitrogen (NO <sub>x</sub> )	0.35	1.40
Total Particulate Matter (PM Total)*	0.07	0.27
Volatile Organic Compounds (VOC)	0.09	0.35
Sulfur Dioxide (SO <sub>2</sub> )	0.07	0.29

\*PM Total includes both filterable and condensable fractions.

## **REGULATORY REVIEW**

Both federal and District of Columbia regulations and applicable requirements apply to this project. Applicability or non-applicability of key regulations is discussed below.

### **DISTRICT OF COLUMBIA REGULATIONS**

20 DCMR 200 – General Permit Requirements: The provisions of this section are applicable to the microturbine as a stationary source of air pollution. A permit is therefore required to operate the microturbine pursuant to 20 DCMR 200.1 and 200.2. The operating permit will be valid for five years. It should be noted that this unit is not eligible for the “fuel burning equipment” exemption from permitting pursuant to 20 DCMR 200.14 because the equipment does not meet the definition of “fuel burning equipment”. The definition of “fuel burning equipment” in 20 DCMR 199 is as follows:

**Fuel burning equipment** - any furnace, boiler, apparatus, stack, and all appurtenances in connection with, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.

The Capstone microturbine technology uses direct heat transfer, rather than indirect heat transfer, thus it does not qualify for the permit exemption.

### 20 DCMR 204 – Permit Requirements for Major Stationary Sources Located in Non-attainment Areas (Non-attainment New Source Review (NNSR)):

The permitted project is located in an area that has been designated non-attainment with respect to the 1979 1-hour ozone National Ambient Air Quality Standard (NAAQS). The area was subsequently designated moderate and marginal non-attainment for the 1997 and 2008 8-hour ozone standards, respectively, and is currently a maintenance area for PM<sub>2.5</sub> standard. The District of Columbia is also located within the Northeast corridor of the Ozone Transport Region (OTR). Nitrogen oxide (NO<sub>x</sub>) and volatile organic compounds (VOCs) emissions are potentially subject to NNSR due to their role as precursors to the photochemical formation of ozone. Although the U.S. Environmental Protection Agency (U.S. EPA) revoked the 1-hr ozone standard, and despite the current designation of moderate non-attainment of the 8-hour ozone standard, the District has

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**  
**United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Microturbines**  
August 16, 2022  
Page 3

retained the 25-tpy NNSR applicability thresholds for NO<sub>x</sub> and VOCs that were applicable for severe nonattainment classification under the 1-hour ozone standard as a measure taken against backsliding.

The requirements of 20 DCMR 204 is that projects with emissions increases and net emissions increases that exceed NNSR thresholds do the following: (1) analyze alternatives, (2) incorporate emission controls meeting the lowest achievable emission (LAER), (3) obtain emission offsets, and (4) certify compliance of all sources located within the District that are owned or operated by applicant. The project (including the boiler and emergency generators addressed under separate covers) result in maximum potential emissions of 10.89 tons of NO<sub>x</sub> per year – well below the significant threshold of 25 tons of NO<sub>x</sub> per year. This is nowhere near a “significant” emissions increase for NO<sub>x</sub> or VOCs, thus, no net emissions increase calculations were necessary to determine NNSR applicability. Based on this analysis, 20 DCMR 204 is not applicable.

20 DCMR 205 – Permit Requirements for New Source Performance Standards (NSPS):  
Subsection 205.1 of 20 DCMR adopts the federal New Source Performance Standards (NSPS) as in effect on September 30, 1997. Additionally, in order to be sufficiently protective of public health pursuant to 20 DCMR 201, the Department places all current applicable NSPS standards into all Chapter 2 permits issued.

The microturbines are not subject to NSPS Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, because they are below the 10 MMBTU/hr. heat input size threshold for applicability. As stated above, the larger of the two units has a heat input rating of 9.12 MMBTU/hr. which is below the applicability threshold stated above.

Likewise, the units are not subject to 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, as they are below an identical 10 MMBTU/hr. heat input applicability threshold.

20 DCMR 209 – Permit Requirements for Non-Major Stationary Sources (Minor New Source Review):

Effective January 1, 2014, the requirements of this section are applicable to any source required to obtain a Chapter 2 permit to construct a new stationary source, modify an existing stationary source, or install or modify an air pollution control device on a stationary source that results in an increase of potential to emit equal to or greater than five tons per year (5 TPY) from an individual unit of any of the criteria pollutants (excluding CO, ozone, and lead). Each of the units does not emit at a rate equal to or greater than 5 TPY of any of the covered pollutants. Therefore, these units are not subject to the requirements of 20 DCMR 209.

20 DCMR Chapter 3 – Operating Permits and Acid Rain Programs:

The Potential to emit of the Capstone microturbines in combination with the five boilers and two emergency generator sets (permitted under separate cover), in aggregate, do not exceed the 25

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**  
**United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Microturbines**  
August 16, 2022  
Page 4

tons per year of NO<sub>x</sub> threshold for a major source (nor any of the other major source thresholds) and therefore no Chapter 3 (Title V) permit is required.

20 DCMR Chapter 5 - Source Monitoring and Testing:

Under this regulation, the Department establishes appropriate monitoring and testing requirements to ensure that the Permittee complies with all relevant emission and operational limits. If the Department has a reason to suspect excess emissions from the equipment, Condition IV(a) allows the Department to test or require emissions testing of the equipment. Annual observations for the presence or absence of visible emissions are required pursuant to Condition IV(c). Formal EPA Reference Method 9 visible emissions testing is required once during the term of the permit pursuant to Condition IV(d).

All applicable record keeping requirements associated with this permit were included in Condition V of the permit. These requirements were included in the permit documents pursuant to 20 DCMR 500.2 and 500.8. Notwithstanding the foregoing, note that due to the low-emitting nature of the microturbine technology, the type of fuel used (natural gas), and the lack of regulations specific to this type of equipment, few monitoring and testing requirements are appropriate or necessary.

20 DCMR Chapter 6, Section 600: Fuel Burning Particulate Emission:

20 DCMR 600.1 is not applicable to the equipment. This section covers emissions from “fuel burning equipment”. As previously discussed, this equipment is not considered “fuel burning equipment”, as it does not meet the definition of that term as found in 20 DCMR 199. The equipment therefore is not subject to this regulation.

20 DCMR Chapter 6, Section 606: Visible Emissions

The visible emissions limitations of 20 DCMR 606.1 are applicable to all units. Visible emissions shall not be emitted into the outdoor atmosphere from the operation of these units; provided, that discharges not exceeding forty percent (40%) opacity (unaveraged) shall be permitted for two 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, or malfunction of equipment. This requirement is contained in Condition II(b) of the permits. Specific testing requirements related to this regulation are also included in the permits.

The microturbines could emit visible emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 606.1 is applicable. This requirement is contained in Condition II(b) of the proposed permits. Related monitoring, testing, and record keeping requirements are also included in the permits.

Note that language has been included in the permit notifying the facility that there is an outstanding call for a State Implementation Plan (SIP) revision from EPA that may result in revisions to the applicable regulation. As such, if the regulation is changed, the new regulatory requirements will supersede those expressed in the permit specifically.

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**  
**United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Microturbines**  
August 16, 2022  
Page 5

20 DCMR Chapter 8, Section 805: Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen (NO<sub>x</sub> RACT)

This facility is not (and there is no record of it having been, on any earlier date) a major source pursuant to 20 DCMR 805.1(a), hence the provisions of this regulation are not applicable. Consequently, associated requirements were excluded from the permits.

20 DCMR Chapter 9, Section 903: Odorous or Other Nuisance Air Pollutants

“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]” is applicable to all sources. This requirement is contained in Condition II(c) of the permits. Minimal monitoring is required as the design of the equipment is unlikely to emit appreciable odors.

**FEDERAL REGULATIONS**

40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines

This regulation does not apply to the microturbines as it applies to all stationary combustion turbines with heat input ratings equal to or greater than 10 MMBtu/hr. This regulation was discussed previously under the District of Columbia Regulations (See 20 DCMR 205).

40 CFR 63, Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

40 CFR 63 Subpart YYYY for gas turbines regulates/monitors Hazardous Air Pollutants (HAPs) such as acetaldehyde, acrolein, benzene, toluene, xylene, cadmium, chromium, lead, etc., through surrogate compounds such as formaldehyde, carbon monoxide (CO) and/or volatile organic compounds (VOCs).

A facility that emits or has the potential to emit 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs, is considered a major source. The proposed project will produce emissions of HAP that are well under the major source thresholds. The facility is also a minor source of HAPs. Therefore, the microturbines are not subject to this MACT standard.

Compliance Assurance Monitoring (CAM) (40 CFR 64)

The project is not subject to 40 CFR 64 because the pre-control emissions of pollutants for all sources are less than the applicability thresholds of the rule.

**RECOMMENDATIONS**

Public comments on the permit action will be solicited from August 26, 2022, through September 26, 2022. AQD will resolve any comments received before taking final action on the applications. If no adverse comments are received, I recommend that permit Nos. 7094-R1 and 7095-R1 be issued in accordance with 20 DCMR 200.2 promptly following the end of the public comment period.

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**  
**United States Department of the Interior, 1849 C Street NW**  
**Permit Nos. 7094-R1 and 7095-R1 to Operate Two Microturbines**  
August 16, 2022  
Page 6

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