CHAPTER 2 TECHNICAL MEMORANDUM

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

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SUBJECT: **United States Department of the Interior, 1849 C Street NW**
Permit Nos. 7089-R1 through 7093-R1 to Operate Five Identical 6.0 MMBTU/hr Boilers

DATE: June 2, 2022

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 boilers at the U.S. Department of the Interior, Main Interior Building, 1849 C Street NW.

It should be noted that applications to operate two natural gas-fired microturbines were also submitted at the same time as the applications for the 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 June 17, 2022, in the D.C. Register. Public comment for the permit action will be solicited through July 18, 2022.

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

TECHNICAL INFORMATION

The five boilers are identified as Boiler #1 through Boiler #5 in the permit. The boilers are each rated at 6.0 MMBTU/hr heat input and fire only natural gas. They are AERCO Benchmark 6000 condensing hydronic boilers. More detailed technical information is included with the permit applications.

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.

20 DCMR 200 – General Permit Requirements: The boilers are stationary and have the potential to emit air pollutants. Each of the boilers has a heat input rating greater than 5 MMBtu/hr.

Therefore each is subject to the requirement to obtain a Chapter 2 permit pursuant to this regulation.

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 $PM_{2.5}$ standard. The District of Columbia is also located within the Northeast corridor of the Ozone Transport Region (OTR). Nitrogen oxide (NO_x) 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 retained the 25-tpy NNSR applicability thresholds for NO_x 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 microturbines being addressed under separate cover) does not result in a "significant" emissions increase for NOx or VOCs, thus, no net emissions increase calculations were necessary to determine NNSR applicability. Based on this analysis, 20 DCMR 204 is not applicable.

It is noteworthy that the boilers have low-NO_x burners with emission guarantee of 20 ppm by volume, dry basis corrected to 3% oxygen. This NO_x emission reduction measure is well established in the industry and is credited for the lower NO_x emissions from the boilers. This emission guarantee is included as a limit in Condition II(e) of the permit. To ensure that an accurate NO_x emissions factor based on this vendor's emission guarantee is derived, a thorough stoichiometric analysis of the combustion processes was conducted. This analysis utilized the stack test data provided with the applications to produce a reasonable estimate of 24.0 lb/MMSCF for the NO_x emissions factor. This approach as used to calculate the maximum uncontrolled NO_x PTE from the boilers ensures emissions limit that is more consistent with the vendor's emissions guarantee. The use of AP-42 for such estimate would have resulted in an overly conservative NO_x emissions for boilers of this class. (100 Ib/MMSCF cf 24 Ib/MMSCF). Condition II(a) of the permit includes the emissions limit to assures that 20 DCMR 204 is not triggered.

20 DCMR 205 – Permit Requirements for New Source Performance Standards (NSPS):
The requirements of this section adopt the federal NSPS codified in 40 CFR 60. Specifically Subpart Dc of 40 CFR Part 60 sets forth the standards of performance for small industrial-

Commercial-Institutional steam generating units (ICI boilers) with maximum design heat input capacity less than 100 MMBtu/hr. and greater than or equal to 10 MMBtu/hr. This Subpart includes steam generating units for which construction, modification, or reconstruction commenced after June 9, 1989.

Each of the natural gas-fired boilers at this facility has a maximum heat input of 6 MMBtu/hr and is therefore not subject to this subpart.

20 DCMR 209 – Permit Requirements for Non-Major Stationary Sources (Minor New Source Review):
Minor New Source Review, which became effective January 1, 2014, is applicable to any source subject to 20 DCMR 200, if such source uses a stationary unit or air pollution control device that, individually, would have the potential to emit equal to or greater than 5 tons per year (tpy) per unit of any criteria pollutant (excluding CO, ozone, and lead) or aggregate of hazardous air pollutants (HAPs). The boilers do not individually have a potential to emit 5 tons per year of NO_x or any other pollutant listed in Section 209.1(b). Therefore the boilers do not trigger a minor source review evaluation pursuant to this regulation.

20 DCMR Chapter 3 – Operating Permits and Acid Rain Programs:
The Potential to emit of the boilers in combination with the two Capstone microturbines and two emergency generator sets (being permitted under separate cover), in aggregate, would not exceed the 25 tons per year of NO_x 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. Due to the small size of the boilers and the low potential to emit, minimal monitoring and testing requirements are appropriate for this equipment. In 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. Quarterly visible emissions monitoring by a method similar to U.S. Environmental Protection Agency (EPA) Reference Method 22 is required pursuant to Condition IV(c). Annual formal EPA Reference Method 9 visible emissions testing is required pursuant to Condition IV(d). Fuel records are required to be maintained pursuant to Condition V(d). All applicable record keeping requirements associated with this permit were included in Condition V of the permit.

20 DCMR Chapter 6, Section 600: Fuel Burning Particulate Emission:
Total suspended particulate emissions from each of the boilers shall not exceed 0.11 pounds per million BTU. This requirement is contained in Condition II(c) of the permit.

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 the 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 boiler 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.

20 DCMR Chapter 8, Section 805: Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen (NOx 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, this requirements were excluded from the permit.

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(d) of the permit.

40 CFR 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
This regulation is not applicable because the units are below the size applicability threshold of 10 MMBTU/hr heat input. Therefore the requirements of this regulation are not included in the permit.

40 CFR 63, Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources:
This facility does not emit or have a potential to emit 10 tons per year or more of a single hazardous air pollutant (HAP) or 25 tons per year or more of any combination of HAPs. Consequently, the facility is considered an area source of HAP emissions.

The boilers operate on natural gas exclusively and are therefore exempted from Subpart JJJJJJ.

CONCLUSIONS

Public comments on the permit action will be solicited from June 17, 2022 through July 18, 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. 7089-R1 through 7093-R1 be issued in accordance with 20 DCMR 200.2 promptly following the end of the public comment period.

JCN