



GOVERNMENT OF THE DISTRICT OF COLUMBIA  
Department of Energy and Environment

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**

TO: File

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

FROM: John Nwoke   
Environmental Engineer

SUBJECT: **MedStar Washington Hospital Center  
Permit Nos. 7263 through 7268 to Operate Six 60.00 MMBTU per Hour, Dual  
Fuel-Fired (natural gas/No. fuel oil) Hot Water Boilers**

DATE: March 11, 2020

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**BACKGROUND INFORMATION**

On July 8, 2019, the Air Quality Division (AQD) of the Department of Energy and Environment (DOEE) received applications for the construction and operation of six dual fuel-fired (natural gas as primary and No. 2 fuel oil as back-up fuel) boilers. The boilers will each be rated at 60.00 MMBTU/hour of heat input. Boilers 1-4 are located in the lower plant of the MedStar Washington Hospital Center (WHC) building, 110 Irving Street NW, Washington DC, while Boilers 5 and 6 are located at the upper plant.

The construction requires the installation of new low oxides of nitrogen (NO<sub>x</sub>) burners for all six existing boilers that are currently operating under Title V Operating Permit No. 014-R1. The construction project also includes the installation of flue-gas recirculation technology on the six boilers. The burners proposed for installation have a slightly higher capacity than the old burners they are replacing. Boilers 1-4 were previously rated at 56.8 MMBTU/hr each and Boilers 5 and 6 were previously rated at 57.3 MMBTU/hr.

The project was undertaken because the existing boilers failed the required stack tests contained in Title V permit No. 014-R1. In order to return to compliance, the facility decided to replace the existing boilers' burners with new low NO<sub>x</sub> burners and install flue gas recirculation (FGR). The new burners will have different emission limits from those previously established in the Title V permit. Most importantly, NO<sub>x</sub> emissions while burning natural gas, the primary fuel, will decrease substantially. Though they will increase somewhat when burning oil, oil usage is strictly limited within the permit. Carbon monoxide limits will similarly decrease for natural gas operation, but increase for oil operation. Particulate matter emission limits will increase for both fuels. Sulfur dioxide will increase marginally on natural gas (likely due to rounding differences in old and new calculations), but will decrease for oil.

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MedStar Washington Hospital Center, has not requested that any of the materials submitted with this application be held confidential.

### **REGULATORY REVIEW**

#### **20 DCMR Chapter 2, Section 200: General Permit Requirements**

The six boilers, as they are to be modified, will be rated at 60.00 MMBtu/hr heat input (natural gas-fired/ No. fuel oil-fired). These units have heat input ratings greater than 5 MMBTU/hr, and therefore require pre-construction permits pursuant to 20 DCMR 200 to perform the modifications.

#### **20 DCMR Chapter 3: Operating Permits and Acid Rain Programs**

The facility is a major source of NO<sub>x</sub>, and is therefore subject to Chapter 3 permitting requirements. They currently hold Title V permit No. 014-R1. This permit is due for renewal. Condition I(g) of the application requires that they submit an application to incorporate the requirements of these Chapter 2 permits into the Title V operating permit within 12 months of issuance of these permits.

#### **20 DCMR Chapter 5, Section 500: Source Monitoring and Testing Requirements**

Appropriate monitoring and testing requirements have been included in Condition IV of the permits with associated record keeping and reporting requirements in Condition V of the permits to ensure that compliance can be fully evaluated.

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

Total suspended particulate emission from each of the boilers shall not exceed 0.07 pounds per MMBTU per 20 DCMR 600.1. This requirement is contained in Condition II(d) of the permit.

#### **20 DCMR Chapter 6, Section 606: Visible Emissions**

The visible emissions limitations of 20 DCMR 606.1 are applicable to these six 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 in Conditions IV(a), (b) and (c).

Note that language has been included in the permit condition 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 superseded those expressed in the permit specifically.

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

NO<sub>x</sub> RACT is applicable to this facility pursuant to 20 DCMR 805.1(a) because it is a major source of NO<sub>x</sub>. See the discussion above related to 20 DCMR Chapter 3 applicability. As such, requirements from 20 DCMR 805 were placed in the set of permits. Specifically, there are two main requirements related to this regulation: 1) the requirement to perform combustion adjustments pursuant to 20 DCMR 805.8, which is contained in Conditions II(g) and V(h); and 2) a 0.30 lb/MMBTU NO<sub>x</sub> emission limit applicable on a calendar day average basis when burning fuel oil exclusively (20 DCMR 805.5(b)). This latter limit is streamlined with more stringent requirements established pursuant to 20 DCMR 201 authority in Condition II(e) of the permits. Stack testing for this limit is required in Condition IV(a).

### 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(f) of the permits.

### 40 CFR 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (NSPS Subpart Dc)

AQD has determined that this regulation is applicable to these units. Each unit has a heat input rating of 60 MMBTU/hr, which is within the size applicability range of between 10 MMBTU/hr and 100 MMBTU/hr. The secondary requirement that the equipment must meet is that the equipment must be constructed, modified, or reconstructed after June 9, 1989. Previously, it was reported that the units had not met that threshold, and in the February 10, 2012 Fact Sheet and Statement of Basis related to the Title V permit (No. 014-R1) it was determined that the regulation was not applicable for that reason. It should be noted, however, that the construction dates for Boilers 4-6 are different in the old evaluation documents and the more recent Chapter 2 permit applications and that Subpart Dc requirements were incorporated in the Title V permit language, perhaps in error.

As a result, AQD evaluated whether installation of these new burners and the flue gas recirculation system would be considered a “modification” pursuant to 40 CFR 60.14 (note that this definition differs from the definition in 20 DCMR 199, which is not relevant for this NSPS applicability determination). Installation of the new burners (with slightly higher heat input ratings than the old burners) and the flue gas recirculation system is a “physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of [a] pollutant to which [NSPS Subpart Dc] applies” on a kg/hr basis. Specifically, NSPS Subpart Dc applies to sulfur dioxide (SO<sub>2</sub>) and particulate matter emissions. It is unclear whether past particulate matter emission limits were appropriate for the equipment, however, compared to previous limits, the new hourly emission limits for particulate matter will be higher following the modification than they were before the modification, both for natural gas and fuel oil operating

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modes. With respect to SO<sub>2</sub>, due to the increased heat input capacity of the burners and the dependence of SO<sub>2</sub> emissions on the sulfur content of the fuel used, the potential emissions of SO<sub>2</sub> increase if one assumes a constant fuel type for comparison. For natural gas, the sulfur content can reasonably be assumed to be constant, so potential to emit using natural gas will increase. Fuel oil operation is more complicated because the units, for regulatory reasons unrelated to this project, has experienced a reduction in sulfur content of its fuel oil over several years. However, if you remove this consideration and assume a constant fuel sulfur content, similar to natural gas operations, due to the increase in capacity of the units, the SO<sub>2</sub> potential to emit increases. On this basis, AQD has determined that the project will constitute a “modification” for purposes of NSPS Subpart Dc applicability.

The permits contain the relevant requirements in Condition II(c), for visible emissions, and a streamlined fuel sulfur requirement in Condition III(b).

#### **40 CFR 63, Subpart JJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers at Area Sources (NESHAP Subpart JJJJJ)**

NESHAP subpart JJJJJ for area source ICI Boilers has the potential to be applicable because the boilers are existing boilers, capable of oil firing, located at an area source of hazardous air pollutants per 40 CFR 63.11193. However, the boilers use fuel oil only as back up fuel, and have been characterized (and requested related fuel use limits) as “gas-fired boiler[s]” as defined in 40 CFR 63.11237, and are therefore not subject to 40 CFR 63, Subpart JJJJJ in the category of oil-fired boilers (see 40 CFR 63.11200) pursuant to 40 CFR 63.111959e). On this basis, the requirements of this regulation have not been applied to the equipment, but Condition III(d), along with related monitoring and record keeping requirements, has been placed in the permits to ensure that the equipment continues to be operated as “gas-fired boilers”.

## **RECOMMENDATIONS**

The proposed project and attached permits comply with all applicable federal and District air pollution control laws and regulations.

The permit action for the boilers will be published in the DC Register and on DOEE’s website on March 20, 2020. Public comments for the permit action will be solicited from March 20, 2020 through April 20, 2020. AQD will resolve any comments received before taking final action on the applications. If no comments are received, I recommend that permit Nos. 7263 through 7268 be issued in accordance with 20 DCMR 200 promptly following the end of the public comment period.

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