

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and Environment

**TECHNICAL SUPPORT MEMORANDUM
FOR PROPOSED SYNTHETIC MINOR PERMITTING ACTION**

Permit No. 7305-SM

TO: File

FROM¹: Stephen S. Ours, P.E.
Chief, Permitting Branch

SUBJECT: **United States Department of State
Synthetic Minor Permit No. 7305-SM for Operations at 2201 C Street NW,
Washington DC**

DATE: January 20, 2022

This Technical Support Memorandum has been prepared to document the basis for a facility-wide synthetic minor operating permit for the following:

Applicant and Permittee:

United States Department of State
2201 C Street NW, B2A61
Washington DC 20520

Facility Location:

United States Department of State
2201 C Street NW
Washington DC 20520

Application Signatory per 20 DCMR 200.13:

Keith D. Hanigan, Deputy Assistant Secretary

¹ Note that this Technical Support Memorandum was initially drafted by Thomas J. Olmstead. However, Mr. Olmstead left the service of the Department of Energy and Environment and Stephen S. Ours revised and finalized the document.

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FACILITY DESCRIPTION AND BACKGROUND INFORMATION:

The United States Department of State's Harry S. Truman Building is located at 2201 C Street NW, Washington DC 20520. The facility's emission unit inventory primarily consists of twelve (12) diesel-fueled emergency generator sets and nine (9) 6.0 MMBTU/hr natural gas-fired boilers as well as various miscellaneous/insignificant fuel burning sources.

The following tables show the boilers and generator sets of significance:

Boilers				
Emission Unit Name	Emission Unit ID	Heat Input Capacity (MMBtu/hr)	Serial No.	Chapter 2 Permit No. †
Boiler 1	B1	6.0	8454	6892-R1
Boiler 2	B2	6.0	8455	6893-R1
Boiler 3	B3	6.0	8441	6894-R1
Boiler 4	B4	6.0	8456	6895-R1
Boiler 5	B5	6.0	8440	6896-R1
Boiler 6	B6	6.0	8439	6897-R1
Boiler 7	B7	6.0	8566	6898-R1
Boiler 8	B8	6.0	8567	6899-R1
Boiler 9	B9	6.0	8565	6900-R1

† These permit numbers and source category permit coverage approval numbers are the Chapter 2 permits under which these units were previously permitted and are for reference only.

Generator Sets				
Emission Unit ID	Emission Unit Location	Generator Output (kWe)	Engine Output (hp)	Source Category Permit Coverage Approval No. †
E-41-2	8th floor	350	568	--
E-41-3	Basement	750	1232	--
E-41-5	8th floor	350	568	--
E-41-6	2nd floor roof	450	765	--
E-41-8	2nd floor roof	1500 [‡]	2328	7048-SC-0113
E-41-9	2nd floor roof	1500 [‡]	2328	7048-SC-0114
E-41-10	2nd floor roof	1500	2668	--
E-41-11	2nd floor roof	1500	2668	--
E-41-12	2nd floor roof	150	237	--
E-41-15	8th floor	400	568	--
E-41-16	8th floor	750	1120	--
E-41-17	9th floor	1750	2561	7048-SC-0074

† These permit numbers and source category permit coverage approval numbers are the Chapter 2 permits under which these units were previously permitted and are for reference only.

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‡ E-41-8 and E-41-9 are identical units and have conflicting nameplates posted on each of the units. One nameplate refers to the electrical output as 1750 kW while the other refers to it as 1500 kW. Only one nameplate lists an engine output (2328 hp), which corresponds with a 1500 kWe generator set. On this basis and documentation provided by email dated January 18, 2022 by Nick Carros, representing the Permittee, the generator sets are being permitted as 1500 kWe units.

On April 20, 2021, the Air Quality Division (AQD) of the Department of Energy and Environment (the Department) received an application, signed April 19, 2021 with cover letter dated April 20, 2021, for a synthetic minor permit for the facility. The proposed permitting action accompanying this Technical Support Memorandum addresses this application. It should be noted that this application replaced a previously submitted, but incomplete, Title V permit application received on August 2, 2018.

DISCUSSION OF PROPOSED SYNTHETIC MINOR LIMITATIONS

In the application, the applicant requested a limit of 100 hours per generator set per year for the twelve emergency generator sets (E-41-2, E-41-3, E-41-5, E-41-6, E-41-8, E-41-9, E-41-10, E-41-11, E-41-12, E-41-15, E-41-16, and E-41-17) and a limit of total natural gas consumption of the United States Department of State not to exceed 121.298 million standard cubic feet (MMSCF) per twelve-consecutive-month period. As demonstrated in the emissions summary below, these limits will ensure that emissions are maintained below the District's major source threshold of 25 tons per year of NO_x, which is the only pollutant that would have exceeded one of the District's major source thresholds if no restrictions on the operations, and therefore the potential to emit, of the facility were taken.

In addition, based on a historical review of the equipment at the facility, it was identified that when emergency generator sets E-41-6, E-41-10, E-41-11, and E-41-16 were installed without permits in 2004, that project should have triggered a non-attainment New Source Review process. However, this issue was not identified until many years later. It would be economically wasteful to install controls on these units at this late date, given the small numbers of hours that they operate, therefore it was determined that an after-the-fact synthetic minor restriction would be appropriate for these units. The 100 hour per year limit on all generator sets in Section III(a) of the permit, found in Condition III(a)(2)(A) achieves this goal and is therefore being adopted pursuant to 20 DCMR 200.7.

With the establishment of the operational limits in Conditions III(a)(2)(A), III(b)(2)(A), and III(c)(2)(B) of the permit, along with associated monitoring and record keeping requirements², and a requirement to report exceedances of these operational limits found in Condition I(c)(3)(B), the operational limits are enforceable as a practical matter, and pursuant to 20 DCMR 200.6, this facility qualifies for synthetic minor status.

Note also that the facility also operates a number of small units that burn fuel that would not normally be subject to the permitting requirements of 20 DCMR Chapter 2 due to their < 5 MMBTU/hr heat input ratings (see 20 DCMR 200.14). However, because these

² See Conditions III(a)(3)(B), III(a)(4)(A)(ii), III(b)(3)(B), III(b)(4)(A)(ii), III(c)(3)(E), and III(c)(4)(D) for these associated monitoring and record keeping requirements.

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miscellaneous/insignificant activities have the potential to emit NO_x, they have been included in Condition IV of the permit. The units identified in the application are listed in Condition IV(e) of the permit, but the facility is not required to obtain permits to install new units in this category. Rather, they are required to maintain a current inventory of these units, track fuel usage to show compliance with the facility-wide fuel usage limit in Condition III(c)(2)(B) of the permit, and regularly estimate emissions from the equipment. These emissions estimates are to be incorporated into the annual emissions reports required for the facility and will be used to ensure that emissions from the facility do not exceed major source thresholds.

EMISSIONS SUMMARY:

The following is an estimate of overall potential emissions from the facility:

FACILITY-WIDE EMISSIONS SUMMARY [TONS PER YEAR]		
Pollutants	Potential Emissions without 20 DCMR 200.6 Limits[†]	Potential Emissions with 20 DCMR 200.6 Limits[‡]
Sulfur Dioxide (SO ₂)	1.25	0.24
Oxides of Nitrogen (NO _x)	104.57	20.41
Particulate Matter (PM)	8.48	4.06
Volatile Organic Compounds (VOCs)	6.02	1.18
Carbon Monoxide (CO)	32.24	6.02

[†] Assumes 500 hours per year of operation for all generator sets.

[‡] Assumes 100 hours per year of operation for the twelve emergency generator sets and natural gas consumption not to exceed 121.298 MMSCF/yr per limits established pursuant to 20 DCMR 200.6 and 200.7.

REGULATORY REVIEW:

This facility has been found to be subject to the requirements of the following regulations (except as specified in notes below):

Federal and District Enforceable:

- 20 DCMR Chapter 1 - General Rules
- 20 DCMR Chapter 2 - General and Non-Attainment Area Permits
- 20 DCMR 500 - Records and Reports
- 20 DCMR 502 - Sampling, Tests, and Measurements
- 20 DCMR 600 - Fuel-Burning Particulate Emission
- 20 DCMR 604 - Open Burning
- 20 DCMR 605 - Control of Fugitive Dust
- 20 DCMR 606 - Visible Emissions
- 20 DCMR 774 - Architectural and Industrial Maintenance Coatings

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20 DCMR 800 - Control of Asbestos

20 DCMR 801 - Sulfur Contents of Fuel Oils

20 DCMR 805 - Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen

40 CFR 51.212, 52.12, 52.30, 60.11, and 61.12 - Credible Evidence

40 CFR 60, Subpart IIII- Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CIICE)

40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (NESHAP for RICE)

District Enforceable Only:

20 DCMR 402 – Chemical Accident Prevention (*Note: AQD did not make a positive determination that this regulation was applicable to the facility, but included it as a standard requirement in the permit.*)

20 DCMR 900 - Engine idling

20 DCMR 901 - Vehicular exhaust emissions

20 DCMR 902 - Lead Content of Gasoline

20 DCMR 903 - Odorous or other nuisance air pollutants

20 DCMR 1406 - Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

20 DCMR Chapter 2 – General and Non-Attainment Area Permits:

All stationary engines are subject to Chapter 2 permitting requirements, regardless of size. Each of the Boilers B1 through B9 has a heat input rating greater than 5 MMBtu/hr. As such, all of the significant units at the facility are subject to Chapter 2 permitting requirements.

As discussed above, the applicant has requested 100 hour per year operational limitations for the twelve emergency generator sets (E-41-2, E-41-3, E-41-5, E-41-6, E-41-8, E-41-9, E-41-10, E-41-11, E-41-12, E-41-15, E-41-16, and E-41-17) and a limit of total natural gas consumption of the United States Department of State not to exceed 121.298 million standard cubic feet (MMSCF) per twelve-consecutive-month period pursuant to 20 DCMR 200.6.

Note that two units, E-41-8 and E-41-9, both NSPS generator sets, were previously permitted under source category permits approval numbers 7048-SC-0113 and 7048-SC-0114, respectively, as emergency generator sets with engine mechanical outputs of 2,328 hp and generator electrical outputs of 1,500 kWe. The synthetic minor application listed the generator electrical outputs as 1,750 kWe. The Department asked the Department of State to investigate this conflict, noting that a 2,328 hp engine cannot produce 1,750 kW of electrical output as the generator would need to be greater than 100% efficient at converting mechanical power to electrical power. The applicant investigated and identified that there are conflicting nameplates on the units. Only one lists an engine mechanical rating (2,328 hp), but there are two different generator nameplates listing 1,500 kWe and 1,750 kWe as electrical outputs. Based on a review of the equipment by a technician, the applicant suggested that the Department should permit the unit based on the smaller generator output of 1,500 kWe (see emails from Nick Carros of the

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Department of State to Stephen Ours of DOEE dated January 18, 2022. AQD has determined that, with the information available, this is the best course of action and is permitting them as 1,500 kWe units in this permit.

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

As discussed above in the “Discussion of Proposed Synthetic Minor Limitations”, 20 DCMR Chapter 3 will no longer be applicable upon the issuance of this permit with its limits established pursuant to 20 DCMR 200.6. The acid rain portions of 20 DCMR Chapter 3 are not, and have never been, applicable to the facility. The synthetic minor permit application being acted upon with this permitting action replaced the previously pending, but incomplete, Title V application received August 2, 2018.

20 DCMR Chapter 5 – Source Monitoring and Testing:

Throughout the permit, appropriate monitoring, testing, and record keeping requirements have been established to ensure that all emission and operational limits in the permit are enforceable as a practical matter. These requirements are established under the authority of Chapter 5.

Regulatory Review for Boilers 1-9 and Miscellaneous/Insignificant Fuel Burning Equipment:

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

Total suspended particulate emission from each of the 6.0 MMBTU/hr boilers shall not exceed 0.11 pounds per million BTU. This requirement is contained in Condition III(c)(1)(C) of the permit. This regulation also applies to the miscellaneous/insignificant activities listed in Condition IV(e) of the permit, but the emissions limit varies depending upon the size of the equipment. This requirement is contained in Condition IV(f)(1) 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 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 Conditions II(b) and III(c)(1)(B) of the permit. Specific testing requirements related to this regulation are also included in Conditions III(c)(3)(C) and (D).

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 801: Sulfur Content of Fuel Oils

These boilers can only burn natural gas. Therefore, the sulfur content of fuel oil limitations do not apply.

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20 DCMR Chapter 8, Section 804: Nitrogen Oxides Emissions

These units are fossil-fuel-fired steam-generating units with a heat input less than 100 MMBTU/hr. Therefore, this regulation is not applicable.

20 DCMR Chapter 8, Section 805: Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen (NO_x RACT)

Pursuant to 805.1(b) Any person owning, leasing, operating, or controlling a stationary source that is or was at any time subject to § 805 shall continue to comply with all requirements of § 805, even if emissions from the subject stationary source no longer exceed the twenty-five (25) ton per year applicability requirement of § 805. The US Department of State has been subject to § 805 in the past. Specifically, § 805 has been implemented for Boilers 1-9 in Permit Nos. 6892-R1 through 6900-R1. More generally, § 805 applied to the facility even when equipment was not properly permitted because the facility has had a potential to emit greater than 25 tons per year of NO_x historically.

Because Boilers 1-9 are located at a stationary source of NO_x that has been subject to 20 DCMR 805, it is applicable to all nine of the boilers. Previously, no specific RACT level was defined in the regulation for the boilers, but AQD has considered annual combustion tuning pursuant to 20 DCMR 805.8 (as previously codified) to meet the requirements of this regulation for similar units. As such, boiler adjustment requirements from 20 DCMR 805 were placed in the previous Chapter 2 permits.

However, on November 24, 2021, the Department finalized an amendment to 20 DCMR 805. This amendment now establishes specific boiler tune-up requirements for these boilers (required biennially). These requirements have been incorporated into Conditions III(c)(1)(D) and III(c)(4)(D).

20 DCMR Chapter 14, Section 1410: Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers

20 DCMR 1401.1 adopts 40 CFR 63, Subpart JJJJJ by reference. Please see the more detailed discussion of the federal regulation below.

40 CFR 60, Subpart D - Standards of Performance for Fossil-Fuel-Fired Steam Generators

The requirements of 40 CFR 60, Subpart D are not applicable to the boilers because they each have heat input rates of less than 250 MMBtu/hr.

40 CFR 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

The requirements of 40 CFR 60, Subpart Db are not applicable to the boilers because they each have heat input rates of less than 100 MMBtu/hr.

40 CFR 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units:

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All of the external combustion units at the US Department of State have heat input ratings less than the 10 MMBTU threshold for this regulation. Therefore, this regulation is not applicable.

40 CFR 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

The requirements of 40 CFR 63, Subpart DDDDD are not applicable to the boilers because the US Department of State is not a major source of HAPs.

40 CFR 63, Subpart JJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources:

The boilers and water heaters at this facility meet the definition of gas-fired boiler and hot water heater, respectively. Therefore, this subpart is not applicable.

Regulatory Review for Emergency Generator Sets:

20 DCMR 801 – Sulfur Content of Fuel Oils:

This regulation limits fuel oil sulfur content to 1% by weight in all circumstances. There are more stringent requirements for commercial fuel oil, but the only portion of 20 DCMR 801 applicable to the emergency engines is the 1% sulfur content limit. This requirement is streamlined with the more stringent requirements found in 40 CFR 63.6604(b) for the non-NSPS engines and 40 CFR 60.4207(b) for the NSPS engines.

20 DCMR 805 – Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen:

The requirements of 20 DCMR 805 do not apply to the engines. Pursuant to 20 DCMR 805.1(c)(2), the requirements of 20 DCMR 805 do not apply to emergency standby engines operated less than five hundred (500) hours for any purpose, and less than 100 hours for maintenance and testing, during any consecutive twelve (12) month period. The emergency generators all have operation hour limits of less than 100 hours listed in Conditions III(a)(2)(A) and III(b)(2)(A) of the permit.

40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines:

The engines of three diesel emergency generator sets at the facility are subject to 40 CFR 60, Subpart IIII. 40 CFR 60, Subpart IIII applies to stationary compression ignition internal combustion engines (CI-ICE) that: 1) commenced construction after July 11, 2005 and were manufactured after April 1, 2006, or 2) were modified or reconstructed after July 11, 2005.

Three (3) diesel CI-ICE identified below are subject to 40 CFR 60, Subpart IIII:

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Emission Unit ID	Emission Unit Location	Generator Output (kWe)	Engine Output (hp)	Date of Manufacture	Install Date
E-41-8	2nd floor roof	1500	2328	2011	2012
E-41-9	2nd floor roof	1500	2328	2011	2012
E-41-17	9th floor	1750	2561	2016	2018

The requirements of this regulation are incorporated throughout Condition III(b) of the permit for these units.

The engines of the nine (9) diesel emergency generator sets at the facility listed below are not subject to 40 CFR 60, Subpart IIII because 40 CFR 60, Subpart IIII applies to stationary compression ignition internal combustion engines (CI-ICE) that: 1) commenced construction after July 11, 2005 and were manufactured after April 1, 2006, or 2) were modified or reconstructed after July 11, 2005. The engines listed below were manufactured before April 1, 2006.

Emission Unit ID	Emission Unit Location	Generator Output (kWe)	Engine Output (hp)	Install Date
E-41-2	8th floor	350	568	1999
E-41-3	Basement	750	1232	1987
E-41-5	8th floor	350	568	1999
E-41-6	2nd floor roof	450	765	2004
E-41-10	2nd floor roof	1500	2668	2004
E-41-11	2nd floor roof	1500	2668	2004
E-41-12	2nd floor roof	150	237	2001
E-41-15	8th floor	400	568	1999
E-41-16	8th floor	750	1120	2004

40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Engines:
This subpart does not apply to this facility because this facility only includes compression ignition (diesel) engines.

40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (NESHAP for RICE):

40 CFR 63, Subpart ZZZZ applies to stationary reciprocating internal combustion engines (RICE) at major or area sources of HAP emissions to regulate/monitor HAPs such as acetaldehyde, acrolein, benzene, toluene, xylene, cadmium, chromium, lead, etc., through surrogate compounds such as formaldehyde, CO and/or VOC.

A facility that emits or has the potential to emit 10 TPY of any single HAP or 25 TPY of any combination of HAPs, is considered a major source. Any source that is not a major source is an

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area source. Because this facility does not have the potential to emit more than 10 TPY of a single HAP or an aggregate of more than 25 TPY of total HAPs, it is an area source. Therefore, the area source NESHAP requirements of Subpart ZZZZ are applicable to this facility.

Subpart ZZZZ is applicable to new or reconstructed diesel compression ignition (CI) engines at this facility, where “new” is defined as those engines that are manufactured or reconstructed after June 12, 2006. However, the only requirements for these units are to comply with 40 CFR 60, Subpart IIII, as applicable. This situation affects E-41-8, E-41-9, and E-41-17 generator sets previously discussed as covered by 40 CFR 60, Subpart IIII. Only the NSPS requirements have been cited in the permit for these units because Subpart ZZZZ does not add any additional compliance requirements.

“Existing” CI engines are also covered by this regulation. Nine diesel engines associated with generator sets at the facility fall into this category as shown in the following table:

Emission Unit ID	Emission Unit Location	Generator Output (kWe)	Engine Output (hp)	Install Date
E-41-2	8th floor	350	568	1999
E-41-3	Basement	750	1232	1987
E-41-5	8th floor	350	568	1999
E-41-6	2nd floor roof	450	765	2004
E-41-10	2nd floor roof	1500	2668	2004
E-41-11	2nd floor roof	1500	2668	2004
E-41-12	2nd floor roof	150	237	2001
E-41-15	8th floor	400	568	1999
E-41-16	8th floor	750	1120	2004

The requirements of this regulation are incorporated throughout Condition III(a) of the permit for these units.

PROCEDURE FOR SUBMITTING COMMENTS OR REQUESTING PUBLIC HEARING:

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Department shall grant such a request if it is deemed appropriate. The venue, date, and time for any public hearing will be announced in the D.C. Register and on the Department’s website.

COMMENT PERIOD:

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Beginning Date: January 28, 2022
Ending Date: February 28, 2022

All written comments should be addressed to the following individual and office:

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