United States Environmental Protection Agency
Office of Enforcement and Compliance Assurance
Office of Criminal Enforcement, Forensics and Training

National Enforcement Investigations Center

NEICVP1494E02

NEIC CIVIL INVESTIGATION REPORT
Bayer CropScience
Kansas City, Missouri 64120

Investigation Dates:
March 20-24, 2023

HANS BUENNING
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NEIC

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INVESTIGATION OVERVIEW

PROJECT OBJECTIVE

This report was created as a supplemental report to a more comprehensive report for the same compliance investigation that contains company-claimed confidential business information. Information and materials that include company-claimed confidential business information are referenced in this report but not contained herein.

At the request of the U.S. Environmental Protection Agency (EPA) Region 7 (Region), EPA's National Enforcement Investigations Center (NEIC) conducted a Clean Air Act (CAA) compliance investigation of the Bayer CropScience (Bayer) facility located at 8400 Hawthorn Road in Kansas City, Missouri. The investigation assessed the facility's compliance with federal environmental statutes and permit requirements as follows (**Table 1**). The investigation also assessed potentially applicable federal CAA requirements not included in the facility's permits.

Table 1. FEDERAL ENVIRONMENTAL STATUTES AND PERMIT REQUIREMENTS

Media	Facility	Regulatory Statutes	Permit No.	Inspection Focus
CAA	Bayer CropScience	• Title V permit • Synthetic minor source (Title V) • Area source (NESHAP)	OP2003-046	• 40 Code of Federal Regulations (CFR) Part 63, Subpart A – General Provisions (area-source versus major-source status) • 40 CFR Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants (NESHAP) from Hazardous Waste Combustors (HWC) • 40 CFR Part 63, Subpart VVVVVV – NESHAP for Chemical Manufacturing Area Sources (MACT 6V) • 40 CFR Part 70, State Operating Permit Programs (compliance with Title V synthetic minor permit limits) • 40 CFR Part 61, Subpart FF – National Emission Standard for Benzene Waste Operations (BWON)

Table 2 lists the project team members.

Table 2. PROJECT TEAM MEMBERS

Team Member	Organization	Project Role
Hans Buenning	NEIC	Project manager
Brianna Leiker	NEIC	Field team member
Cindy Schafer	NEIC	Field team member
REGIONAL AND OTHER CONTACTS		
Christopher Appier	EPA Region 7	Regional field team member

FACILITY CONTACT INFORMATION

Table 3 lists the primary facility contacts.

Table 3. FACILITY CONTACT INFORMATION	
Name, Title	**Email Address**
Scott Munk, Senior Regulatory Affairs Consultant	Scott.Munk@bayer.com
Paul Oruoch, Senior Environmental Engineer	Paul.Oruoch@bayer.com
Richard Rocha, Senior Environmental Compliance Manager	Richard.Rocha@bayer.com

FACILITY OVERVIEW AND OPERATIONS SUMMARY

Bayer CropScience (Bayer) operates an industrial chemical manufacturing plant that manufactures intermediate and active ingredients to produce fungicides and herbicides using various raw materials. Bayer also formulates fungicides and herbicides at the Kansas City facility. The facility was originally built in 1956, and there have been many changes and additions to the facility since that time. The facility operates 24 hours a day, 7 days a week. Bayer employs approximately 600 full-time staff and approximately 150 contractors at the facility.

Bayer operates three intermediate and active ingredient production plants at the Kansas City, Missouri, facility. The plants are referred to as the organophosphate plant (OPP), the high active herbicide (HAH) plant, and the Sencor/Flufenacet (FOE) plant (SFP). The facility no longer makes organophosphate but has kept the acronym for that part of the plant; the OPP plant is where the facility manufactures acid chloride and potassium salt intermediates. The facility is divided into four sites: site I contains the OPP and HAH plants; site II contains utilities including the thermal oxidizer incineration unit, the vent gas incinerator, and the wastewater treatment plant; site III contains the administrative building and parking lot; and site IV contains the SFP plant. The NEIC CAA inspection focused on intermediate and active ingredient manufacturing and sites I and IV and the incineration units and control devices in site II.

Bayer uses reactor vessels, phase separation, liquid-liquid extraction, distillation columns, and various carrier solvents and catalysts in the production process for intermediate and active ingredients. Raw ingredients are reacted in the presence of catalysts in carrier solvents to form the desired intermediate and active ingredients, then the catalysts and carrier solvents are separated from the desired intermediate or active ingredient to isolate the product. Catalysts are recovered using different processes, including phase separation. Carrier solvents are recovered using different processes, including distillation. A more detailed process description is provided in **Appendix A**, which **contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B**.

Bayer's production operations generate a variety of liquid hazardous wastes that are incinerated on-site in a thermal oxidation unit known as TO II. TO II is a pressurized, down-fired John Zink Company-manufactured unit designed to accommodate both organic and aqueous waste liquids. The unit is rated at approximately 41 million British thermal units (MMBtu) per hour and is designed to burn approximately 21 gallons per minute of liquid wastes and approximately 8,000 standard cubic feet per minute (scfm) of process vent streams. Liquid waste materials are fed to TO II from either storage tanks or directly from transport vehicles within the plant. Organic wastes are the primary fuel source for TO II, with natural gas and fuel oil added as auxiliary fuel, as necessary. Process vent streams from the manufacturing process are also occasionally fed to TO II.

Exhaust gasses from TO II are routed through a gas conditioning and air pollution control system designed to remove particulates, metals, and acid gases. Exhaust gases are first rapidly cooled with sprays of well and recycled water before entering the quench tank, where the gas is further cooled by direct contact with water before being routed to a venturi scrubber. The high-energy, adjustable-throat venturi scrubber removes entrained particulates with process water. Entrained water droplets in the gas stream are then removed in a cyclone separator. A packed-bed acid gas scrubber is then used to remove acid gases before the gas is passed through a fiber bed mist eliminator to remove fine particulates and metals. After the mist eliminator, the gas exits through an exhaust stack.

TO II is subject to 40 Code of Federal Regulations (CFR) Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors, which specifies maximum achievable control technology (MACT) and is known as the "HWC MACT." Under the HWC MACT, Bayer was required to perform an initial comprehensive performance test (CPT) on TO II, and subsequent CPTs are required no later than 61 months after the previous CPT. The CPT demonstrates compliance with the emission limits in the HWC MACT for various hazardous air pollutants (HAPs), or surrogates, and establishes operating parameter limits (OPLs) to demonstrate continuous compliance with emission limits between CPTs. In addition, Bayer is required under the HWC MACT to conduct a confirmatory performance test (CfPT) for dioxins and furans in the time between each five-year CPT. The CfPT must be conducted no later than 31 months after the previous CPT. OPLs are not established during the CfPT.

Process vent streams are collected and transported to the control device in the lean gas header. Process vent streams are primarily controlled using a thermal oxidation system known as the vent gas incinerator (VGI). As mentioned above, TO II also can incinerate process vent streams and has served as the backup incinerator for vent gas streams since installation of the VGI. The VGI consists of a combustion chamber, a waste heat boiler, an induced draft fan, and a quench/acid gas scrubber system, which vents to the exhaust stack. The VGI has a capacity to control up to 15 MMBtu of vent gases (mixed with natural gas) and a dedicated burner for natural gas rated at 10 MMBtu. Process vent streams routed to the VGI originate from the following on-site processes: the SFP plant, the OPP plant, the HAH plant, the wastewater treatment plant, and the TO II tank farm.

Some vent streams controlled by the VGI are subject to the control requirements in 40 CFR Part 63, Subpart VVVVVV – NESHAP for Chemical Manufacturing Area Sources (MACT 6V). Under MACT 6V, the VGI must reduce organic HAP emissions by at least 95 percent by weight (destruction efficiency) or to a concentration of less than 20 parts per million by volume (ppmv). Following combustion, vent streams subject to MACT 6V must be routed to a halogen reduction device, which is the quench/acid gas scrubber system at Bayer. The halogen reduction device must reduce halogen halide and halogen HAP emissions by at least 95 percent, to less than or equal to 0.45 kilograms per hour, or to a concentration of less than or equal to 20 ppmv. Bayer is required to continuously monitor (at least once per minute) the operating parameters of the VGI and the quench/acid gas scrubber system and calculate the daily average values of those parameters to demonstrate compliance with MACT 6V.

Bayer completed a performance test for the VGI on September 13 and 14, 2016. The performance test demonstrated that the MACT 6V requirements for HAP destruction efficiency, HAP concentration in emissions, or both were achieved during both Condition I (operated at minimum combustion chamber temperature) and Condition II (operated at maximum volatile organic compounds [VOC], HAP, and chlorine vent loading). The performance test also established the OPLs for the VGI and quench/acid gas scrubber system that demonstrate compliance with MACT 6V. Unlike TO II, Bayer is currently not required to conduct periodic performance testing on the VGI because the VGI is not considered a hazardous waste incinerator under the HWC MACT and there are no ongoing performance test requirements in MACT 6V.

According to the EPA Envirofacts database, this facility (EPA Registry Identification No. 110000443226) has the following North American Industry Classification System (NAICS) code: 325320, Pesticide and Other Agricultural Chemical Manufacturing.

FIELD ACTIVITIES SUMMARY

On March 20, 2023, the NEIC field team conducted an opening meeting and presented credentials to Scott Munk, Bayer's Senior Regulatory Affairs Consultant. The on-site inspection close-out meeting was held on March 24, 2023.

Investigation activities included the following:

- Detailed process reviews
- Interviews with plant personnel
- Review of reports and records

- Review of regulatory applicability
- Process area walkthroughs and inspections in site I, site II, and site IV, which included:
    - Leak detection and repair (LDAR) monitoring according to EPA Method 21
    - Surveys for VOC emissions using optical gas imaging
    - Visiting the control room for TO II and the VGI

HWC MACT Review

Prior to the inspection, NEIC requested that Bayer have certain documents available related to compliance with the HWC MACT for TO II, including the initial notification, the initial and most recent notice of compliance, the initial and most recent CPT, the most recent CfPT, the test plan for the most recent CPT, and information and data related to applicable OPLs. During the inspection, NEIC reviewed these documents and data, discussed how the CPTs were designed and how the OPLs were set with Bayer representatives. See Observations 3, 4, 5, and 6 in the **Investigation Observations** section of this report for information regarding NEIC's review and a HWC MACT compliance assessment for TO II.

Emission Calculation Review

During the inspection, NEIC inspectors requested Bayer's potential-to-emit (PTE) and actual emission calculation data covering the period of 2019-2022 for the HAPs emitted by the facility. Bayer provided Microsoft Access databases containing the number of hours its process units were vented to the atmosphere, to the VGI, and to II. Emission factors for the process units were provided in the PTE calculations. NEIC used these data to independently calculate the actual HAP emissions as compared to the actual HAP emissions reported by Bayer to the Missouri Department of Natural Resources for 2019-2022. See Observations 1 and 2 in the **Investigation Observations** section of this report for information regarding NEIC's independent calculation of emissions reported by Bayer.

Applicability Review of 40 CFR Part 60, Subparts NNN, RRR, and VVa

During the inspection, Bayer representatives provided NEIC inspectors with detailed process flow diagrams and explained the facility's processes to the inspection team. As part of this discussion, NEIC identified three potentially applicable New Source Performance Standards (NSPS), specifically, 40 CFR Part 60, Subparts NNN, RRR, and VVa, which apply to distillation units, reactors, and equipment in VOC service, respectively. Additionally, Bayer representatives provided documentation detailing Bayer's assessment of the applicability of the NSPS regulations to the operations at the facility. This documentation is provided in **Appendix B**, which **contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)**.

Applicability Review of 40 CFR Part 61, Subpart FF (BWON)

The only known source of benzene in waste streams at Bayer is as a contaminant or residual component in toluene and xylene solvents. Bayer tracks the purchased quantities of toluene and xylene and calculates the annual benzene waste generated at the facility using the purchased quantities and the benzene concentration specified in safety data sheets provided by the toluene and xylene suppliers. As reviewed by NEIC, Bayer's records demonstrate that the benzene waste quantities generated in calendar years 2017-2022 were less than 1 megagram per year. Bayer's records **contain company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B** (**Appendix C**).

Measurement Activities

The NEIC field team provided support to this investigation by conducting LDAR monitoring and optical gas imaging. Hans Buenning, Brianna Leiker, and Cindy Schafer performed the optical gas imaging using a FLIR GF320 camera. **Table 4** summarizes field measurement and field sampling activities; additional information can be found in the LDAR monitoring summary (**Appendix D**) and the project file. No infrared videos were recorded during the inspection.

The NEIC field team found leaks greater than 500 ppmv from nine tanks and shared the leak information with Bayer personnel (**Appendix D**). Based on NEIC's review, the nine leaking tanks did not appear to be subject to the control requirements of 40 CFR Part 60, Subpart Kb (based on tank size and the vapor pressure of the stored material) or 40 CFR Part 63, Subpart VVVVVV (based on the stored material).

All environmental measurement activities were performed in accordance with the NEIC quality system. All field sampling and/or field measurements/monitoring described in this report are within the scope of NEIC's ISO/IEC 17025 accreditation issued by the ANSI National Accreditation Board (certificate No. FT-0303).

Table 4. FIELD MEASUREMENT ACTIVITIES

Location Identifier	Dates	Method and/or Procedure[1], and Equipment	Measurer Name
Process areas and regulated LDAR equipment	March 20, 22, and 23, 2023	**Method:** EPA Method 21: Determination of Volatile Organic Compound Leaks **NEIC procedure:** *Toxic Vapor Analyzer (TVA)*, NEICPROC/00-016 **Equipment:** TVA 2020 toxic vapor analyzer, serial No. (S/N) B24354	Brianna Leiker Cindy Schafer

Table 4. FIELD MEASUREMENT ACTIVITIES			
Location Identifier	**Dates**	**Method and/or Procedure[1], and Equipment**	**Measurer Name**
Process areas and regulated LDAR equipment, for safety	March 20-23, 2023	**NEIC procedure:** *Safety and Sample Screening Instruments,* NEICPROC/17-002 **Instrument guide**: *MSA Altair 5X Multi-Gas Monitoring Equipment* **Equipment:** MSA Altair 5x multiple-gas monitor, S/N 2419	Hans Buenning Brianna Leiker Cindy Schafer
[1] The current version of each procedure, at the time of the investigation, was followed.			

INVESTIGATION OBSERVATIONS

NEIC identified the following observations during the CAA compliance inspection. NEIC field team members discussed some observations with facility representatives during the closeout meeting, but other observations described below required additional information and analysis following the inspection closeout meeting.

These observations are not final compliance determinations. EPA Region 7 will make the final compliance determinations based on its review of this report and other technical, regulatory, and facility information.

Observation 1

Observation Summary: NEIC identified issues with the tracking and methodology of Bayer's actual emission calculations and found that the synthetic minor plant-wide permit emission limits cannot be enforced as a practical matter.

Citation:

Permit No. 102017-016, Special Condition 2 (effective date October 26, 2017)

2. *Installation-Wide Emission Limitations*

> **A.** *Bayer CropScience shall not exceed the annual plant-wide emission limits listed below in Table 1. All limits are based on a consecutive 12-month period. The limits apply to emissions from all equipment/processes installed or permitted at Bayer CropScience as of the issuance date of this permit.*

Table 1. Installation-Wide Emission Limits

Pollutant	*Emission Limit (tons per year)*
PM	*99.0*
PM_{10}	*99.0*
SO_x	*99.0*
NO_x	*99.0*
VOC	*99.0*
CO	*99.0*
Any Individual HAP	*9.9*
Total HAPs	*24.9*

40 CFR Part 63, Subpart A – General Provisions

40 CFR § 63.2 Definitions

Federally enforceable *means all limitations and conditions that are enforceable by the Administrator and citizens under the Act or that are enforceable under other statutes*

Observation 1
administered by the Administrator. Examples of federally enforceable limitations and conditions include, but are not limited to: **(1)** *Emission standards alternative emission standards, alternative emission limitations, and equivalent emission limitations established pursuant to section 112 of the Act as amended in 1990;* **(2)** *New source performance standards established pursuant to section 111 of the Act, and emission standards established pursuant to section 112 of the Act before it was amended in 1990;* **(3)** *All terms and conditions in a title V permit, including any provisions that limit a source's potential to emit, unless expressly designated as not federally enforceable;* **(4)** *Limitations and conditions that are part of an approved State Implementation Plan (SIP) or a Federal Implementation Plant (FIP);* **(5)** *Limitations and conditions that are part of a Federal construction permit issued un 40 CFR 52.21 or any construction permit issued under regulations approved by the EPA in accordance with 40 CFR part 51;* **(6)** *Limitations and conditions that are part of an operating permit where the permit and the permitting program pursuant to which it was issued meet all of the following criteria:* **(i)** *The operating permit program has been submitted to and approved by EPA into a State implementation plan (SIP) under section 110 of the CAA;* **(ii)** *The SIP imposes a legal obligation that operating permit holders adhere to the terms and limitations of such permits and provides that permits which do not conform to the operating permit program requirements and the requirements of EPA's underlying regulations may be deemed not "federally enforceable" by EPA;* **(iii)** *The operating permit program requires that all emission limitations, controls, and other requirements imposed by such permits will be at least as stringent as any other applicable limitations and requirements contained in the SIP or enforceable under the SIP, and that the program may not issue permits that waive, or make less stringent, any limitations or requirements contained in or issued pursuant to the SIP, or that are otherwise "federally enforceable";* **(iv)** *The limitations, controls, and requirements in the permit in question are permanent, quantifiable and otherwise enforceable as a practical matter; and* **(v)** *The permit in question was issued only after adequate and timely notice and opportunity for comment for EPA and the public.*

Observation 1
(7) *Limitations and conditions in a State rule or program that has been approved by the EPA under subpart E of this part [40 C.F.R. Part 63] for the purposes of implementing and enforcing section 112; and* **(8)** *Individual consent agreements that the EPA has legal authority to create.* **54 Federal Register (FR) 27274, June 28, 1989 (excerpt from page 27283, middle column)** *The fourth condition for Federal enforceability – that the permit limitations be enforceable as a practical matter – is an essential element in EPA's implementation of the existing Federal enforceability requirement. If permit limitations, whether in operating or construction permits, were not practical to enforce, the purposes for which Federal enforceability was intended could not be met. Thus, all emissions units must be reasonably described, and verifiable, enforceable emissions limits must be assigned to them. For example, an emissions limit expressed only in tons of pollution per year would not be considered practically enforceable.* **85 FR 73854, November 19, 2020 (excerpt from page 73856, first column)** *This interim ministerial revision is also consistent with the EPA's long-standing policy that allows for physical or operational limitation on the capacity of the stationary source to emit a pollutant to be treated as part of the source's design if the limitation or the effect it would have on emissions is, first, either federally enforceable or legally enforceable by a state or local permitting authority and, second, practicably enforceable.*
Evidence: **Appendix E** – Missouri Department of Natural Resources Permit to Operate OP2003-046 **Appendix F** – Actual Emissions 2019-2022 **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix G** – Microsoft Access Emissions Databases **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix H** – Bayer Site-wide PTE Calculations **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix I** – Emission Units/Process Points without HAPs Emission Rates for 2022 **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix J** – NEIC Actual HAP Emissions Calculations **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix K** – Missouri Department of Natural Resources Permit to Construct 062015-006 **Appendix L** – Missouri Department of Natural Resources Permit to Construct 102017-016 **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix M** – Missouri Department of Natural Resources Permit to Construct 082022-012
Description of Observation: This description contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B.

Observation 2
Observation Summary: Based on NEIC's calculations of actual emissions, the Bayer facility is a major source under NESHAP. Additionally, Bayer's PTE calculations are deficient because they do not account for fugitive emissions from equipment leaks and they do not account for emissions from emission units that periodically vent to atmosphere (periodic venting to atmosphere is not explicitly prohibited by Bayer's permits and is in fact a substantial percentage of actual emissions).

Citation:

Permit No. 102017-016, Special Condition 2 (effective date of October 26, 2017)

2. *Installation-Wide Emission Limitations*

> **A.** *Bayer CropScience shall not exceed the annual plant-wide emission limits listed below in Table 1. All limits are based on a consecutive 12-month period. The limits apply to emissions from all equipment/processes installed or permitted at Bayer CropScience as of the issuance date of this permit.*

Table 1. Installation-Wide Emission Limits

Pollutant	*Emission Limit (tons per year)*
PM	*99.0*
PM_{10}	*99.0*
SO_x	*99.0*
NO_x	*99.0*
VOC	*99.0*
CO	*99.0*
Any Individual HAP	*9.9*
Total HAPs	*24.9*

40 CFR Part 63, Subpart A – General Provisions

40 CFR § 63.2 Definitions

Fugitive emissions *means those emissions from a stationary source that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Under section 112 of the [Clean Air] Act, all fugitive emissions are to be considered in determining whether a stationary source is a major source.*

Evidence:
Observation 1
Appendix F – Actual Emissions 2019-2022 **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)**
Appendix G – Microsoft Access Emissions Databases **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)**

Observation 2
Appendix H – Bayer Site-wide PTE Calculations **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix I** – Emission Units/Process Points without HAPs Emission Factors for 2022 **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)** **Appendix J** – NEIC Actual HAP Emissions Calculations **(Contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B)**
Description of Observation: This description contains company-claimed confidential business information and may only be disclosed in accordance with 40 C.F.R. Part 2, Subpart B.

Observation 3

Observation Summary: Bayer did not demonstrate in their comprehensive performance test (CPT) plan for TO II why two CPT test conditions were necessary (by, for example, identifying conflicting parameters, reasons for conflict, and/or changes made in operating parameters to allow for testing at worst case conditions for conflicting parameters), and the two tests were conducted under dissimilar test conditions.

Citation:

40 CFR Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors

40 CFR § 63.1200 Who is subject to these regulations?

The provisions of this subpart apply to all hazardous waste combustors: hazardous waste incinerators, hazardous waste cement kilns, hazardous waste lightweight aggregate kilns, hazardous waste solid fuel boilers, hazardous waste liquid fuel boilers, and hazardous waste hydrochloric acid production furnaces. Hazardous waste combustors are also subject to applicable requirements under parts 260 through 270 of this chapter.

(a) *What if I am an area source?*

> **(1)** *Both area sources and major sources are subject to this subpart.*
>
> **(2)** *Both area sources and major sources subject to this subpart, but not previously subject to title V, are immediately subject to the requirement to apply for and obtain a title V permit in all States, and in areas covered by part 71 of this chapter.*

40 CFR § 63.1201 Definitions and acronyms used in this subpart.

Operating requirements means operating terms or conditions, limits, or operating parameter limits developed under this subpart that ensure compliance with the emission standards.

40 CFR § 63.1206 When and how must you comply with the standards and operating requirements?

Observation 3

(c) Operating requirements —

(1) General.

(i) *You must operate only under the operating requirements specified in the Documentation of Compliance under § 63.1211(c) or the Notification of Compliance under §§ 63.1207(j) and 63.1210(d)*

(ii) *The Documentation of Compliance and the Notification of Compliance must contain operating requirements including, but not limited to, the operating requirements in this section and § 63.1209*

(iii) *Failure to comply with the operating requirements is failure to ensure compliance with the emission standards of this subpart;*

40 CFR § 63.1207 What are the performance testing requirements?

(a) General. *The provisions of § 63.7 apply, except as noted below.*

(b) Types of performance tests —

(1) *Comprehensive performance test. You must conduct comprehensive performance tests to demonstrate compliance with the emission standards provided by this subpart, establish limits for the operating parameters provided by § 63.1209, and demonstrate compliance with the performance specifications for continuous monitoring systems.*

(2) *Confirmatory performance test. You must conduct confirmatory performance tests to:*

(i) *Demonstrate compliance with the dioxin/furan emission standard when the source operates under normal operating conditions; and*

(ii) *Conduct a performance evaluation of continuous monitoring systems required for compliance assurance with the dioxin/furan emission standard under § 63.1209(k).*

(d) Frequency of testing. *Except as otherwise specified in paragraph (d)(4) of this section, you must conduct testing periodically as prescribed in paragraphs (d)(1) through (d)(3) of this section. The date of commencement of the initial comprehensive performance test is the basis for establishing the deadline to commence the initial confirmatory performance test and the next comprehensive performance test. You may conduct performance testing at any time prior to the required date. The deadline for commencing subsequent confirmatory and comprehensive performance testing is based on the date of commencement of the previous comprehensive performance test. Unless the Administrator grants a time extension under paragraph (i) of this section, you must conduct testing as follows:*

(1) *Comprehensive performance testing. Except as otherwise specified in paragraph (d)(4) of this section, you must commence testing no later than 61 months after the date of*

Observation 3

commencing the previous comprehensive performance test used to show compliance with § 63.1216, § 63.1217, § 63.1218, § 63.1219, § 63.1220, or § 63.1221…

(2) *Confirmatory performance testing. Except as otherwise specified in paragraph (d)(4) of this section, you must commence confirmatory performance testing no later than 31 months after the date of commencing the previous comprehensive performance test used to show compliance with § 63.1217, § 63.1219, § 63.1220, or § 63.1221...*

(e) Notification of performance test and CMS performance evaluation, and approval of test plan and CMS performance evaluation plan.

(1) *The provisions of § 63.7(b) and (c) and § 63.8(e) apply, except:*

(i) *Comprehensive performance test. You must submit to the Administrator a notification of your intention to conduct a comprehensive performance test and CMS performance evaluation and a site-specific test plan and CMS performance evaluation test plan at least one year before the performance test and performance evaluation are scheduled to begin.*

(A) *The Administrator will notify you of approval or intent to deny approval of the site-specific test plan and CMS performance evaluation test plan within 9 months after receipt of the original plan.*

(g) Operating conditions during testing. *You must comply with the provisions of § 63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of § 63.7(e)(1) to conduct performance testing under representative operating conditions.*

(1) *Comprehensive performance testing —*

(i) *Operations during testing. For the following parameters, you must operate the combustor during the performance test under normal conditions (or conditions that will result in higher than normal emissions):*

(A) *Chlorine feedrate. You must feed normal (or higher) levels of chlorine during the dioxin/furan performance test;*

(ii) *Modes of operation. Given that you must establish limits for the applicable operating parameters specified in § 63.1209 based on operations during the comprehensive performance test, you may conduct testing under two or more operating modes to provide operating flexibility.*

(j) Notification of compliance —

(1) Comprehensive performance test.

Observation 3

(i) *Except as provided by paragraphs (j)(4) and (j)(5) of this section, within 90 days of completion of a comprehensive performance test, you must postmark a Notification of Compliance documenting compliance with the emission standards and continuous monitoring system requirements, and identifying operating parameter limits under § 63.1209.*

(ii) *Upon postmark of the Notification of Compliance, you must comply with all operating requirements specified in the Notification of Compliance in lieu of the limits specified in the Documentation of Compliance required under § 63.1211(c).*

40 CFR § 63.1209 What are the monitoring requirements?

(i) When an operating parameter is applicable to multiple standards. *Paragraphs (j) through (p) of this section require you to establish limits on operating parameters based on comprehensive performance testing to ensure you maintain compliance with the emission standards of this subpart. For several parameters, you must establish a limit for the parameter to ensure compliance with more than one emission standard. An example is a limit on minimum combustion chamber temperature to ensure compliance with both the DRE standard of paragraph (j) of this section and the dioxin/furan standard of paragraph (k) of this section. If the performance tests for such standards are not performed simultaneously, the most stringent limit for a parameter derived from independent performance tests applies.*

(k) Dioxins and furans. *You must comply with the dioxin and furans emission standard by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.*

(2) Minimum combustion chamber temperature.

(i) *For sources other than cement kilns, you must measure the temperature of each combustion chamber at a location that best represents, as practicable, the bulk gas temperature in the combustion zone. You must document the temperature measurement location in the test plan you submit under §§ 63.1207(e) and (f);*

(ii) *You must establish a minimum hourly rolling average limit as the average of the test run averages.*

(3) Maximum flue gas flowrate or production rate.

(i) *As an indicator of gas residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.*

(ii) *You must comply with this limit on a hourly rolling average basis;*

Observation 3
(4) Maximum hazardous waste feedrate. **(i)** *You must establish limits on the maximum pumpable and total (pumpable and nonpumpable) hazardous waste feedrate for each location where waste is fed.* **(ii)** *You must establish the limits as the average of the maximum hourly rolling averages for each run.* **(iii)** *You must comply with the feedrate limit(s) on a hourly rolling average basis;* **(q) Operating under different modes of operation.** *If you operate under different modes of operation, you must establish operating parameter limits for each mode. You must document in the operating record when you change a mode of operation and begin complying with the operating limits for an alternative mode of operation.*
Evidence: **Appendix N** – Bayer CropScience 2019 CPT Report **Appendix O** – Bayer CropScience 2022 Notice of Compliance **Appendix P** – EPA Technical Support Document for HWC MACT Standards **Appendix Q** – Bayer CropScience Test Plan for 2019 CPT **Appendix R** – TO II Operating Data January 2022-March 2023 **Appendix S** – TO II Hazardous Waste Monthly Rates
Description of Observation: Based on documents provided to NEIC during the on-site inspection, TO II is subject to the HWC MACT. The most recent CPT to demonstrate compliance with emission standards and establish operating parameter limits (OPLs) under the HWC MACT for TO II was conducted by Bayer during the week of June 3, 2019 (**Appendix N**). Bayer's 2019 CPT was designed and conducted with two test conditions and the reported results of the CPT show compliance with the HWC MACT emission standards that were tested under each condition. Condition I was conducted to demonstrate compliance with all applicable emission standards and the destruction and removal efficiency (DRE) standard. The one exception is mercury, for which Bayer relied upon the performance test waiver of 40 CFR § 63.1207(m). Condition I was conducted while TO II was operating at "the maximum inlet gas flow rate, the maximum total hazardous waste feed rate, and worst-case air pollution control system operations." (**Appendix N**). All but one of the applicable OPLs were established during Condition I; the exception is minimum combustion chamber temperature. Condition II was conducted to demonstrate compliance with only the dioxins and furans (D/F) and carbon monoxide (CO) emission standards while operating the TO II at the minimum combustion chamber temperature to establish those OPLs. According to the 2019 CPT report (page [pg.] 9), "these two test conditions represent the extreme range of normal conditions, which is consistent with the requirements of 40 CFR § 63.1207(g)" (**Appendix N**). In addition, the 2019 CPT report says (pg. 9), "Bayer did not demonstrate the DRE for the TO II at the minimum combustion chamber temperature during Condition II of this CPT" because "DRE was demonstrated at the minimum combustion chamber temperature during the initial CPT for the HWC NESHAP Interim Standards in 2004." Bayer also did not demonstrate the hydrocarbon (HC) emissions during Condition II.

Observation 3

According 40 CFR § 63.1209(k), the applicable OPLs for the D/F standard for an incinerator with TO II's configuration are minimum combustion temperature, maximum flue gas flow rate, and maximum hazardous waste feedrate. The table below lists the operating rates for these parameters as averaged over three test runs during both Condition I and Condition II of the 2019 CPT, as well as some other parameters pertinent to the D/F standard and total hazardous waste feedrate.

2019 CPT Operating Rates for TO II

Operating Parameter[1]	Units	Condition I	Condition II
Combustion Chamber Temperature	Degrees Celsius (°C)	1,020	825
Inlet Gas Flowrate	scfm	8,229	5,240
Hazardous Waste Feedrate	Pounds per minute (lb/min)	198	19
Organic Waste Feedrate	lb/min	42	7.6
Aqueous Waste Feedrate	lb/min	150	8.7
Chlorine Feedrate	lb/hr	500	174

[1] Italicized operating parameters are those specific to the D/F standard for establishing OPLs.

According to the 2019 CPT report (**Appendix N**, pg. 47):

> *Bayer demonstrated compliance with the DRE standard and the HC emission standard during the initial CPT for the HWC NESHAP Interim Standards in 2004. The minimum combustion chamber temperature was established during Condition I. The average of the test run averages during this condition was 821 degrees Celsius (°C).*
>
> *Bayer demonstrated compliance with the D/F emission standard while minimizing combustion chamber temperature during Condition II of this CPT. The average of the test run averages was 825°C. The OPL is established as the more stringent value from the DRE and D/F compliance demonstrations. Therefore, the minimum combustion chamber temperature OPL is 825°C.*

Bayer's 2022 Notice of Compliance (NOC) following their October 2021 CfPT includes the following OPLs pertinent to the D/F emission standard that were established during the 2019 CPT (**Appendix O**).

2019 CPT Operating Parameter Limits for TO II		
Operating Parameter	Units	OPL in NOC
Minimum combustion chamber temperature	°C	825
Maximum flue gas flow rate (as inlet gas flow rate)	scfm	8,223
Maximum total hazardous waste feed rate	lb/min	201

Bayer established the combustion chamber temperature OPL using the average of the test run averages, while flue gas flow rate and hazardous waste feedrate were established using the average of the maximum hourly averages for each test run, as specified in 40 CFR § 63.1209(j). Hence, the values for flue gas flow rate and hazardous waste feedrate for the OPLs do not match the rates listed in the previous table.

During the inspection, NEIC inspectors raised a concern about the large disparity between the actual minimum combustion chamber temperature, inlet gas flowrate, and hazardous feedrate (i.e., the three applicable D/F OPLs) maintained during the 2019 CPT Condition I and Condition II and questioned why two test conditions were necessary. Bayer representatives stated that as hazardous waste feedrate increases, so does combustion chamber temperature. As a result, they needed to vary the hazardous waste feedrate to get ample operational flexibility at the high end of their operating range of hazardous waste feedrate and set the minimum combustion chamber temperature OPL under lower hazardous waste feedrates to cover that range of operating conditions. Bayer representatives also stated they cannot use other process controls for TO II to counter the relationship between hazardous waste feedrate and combustion chamber temperature.

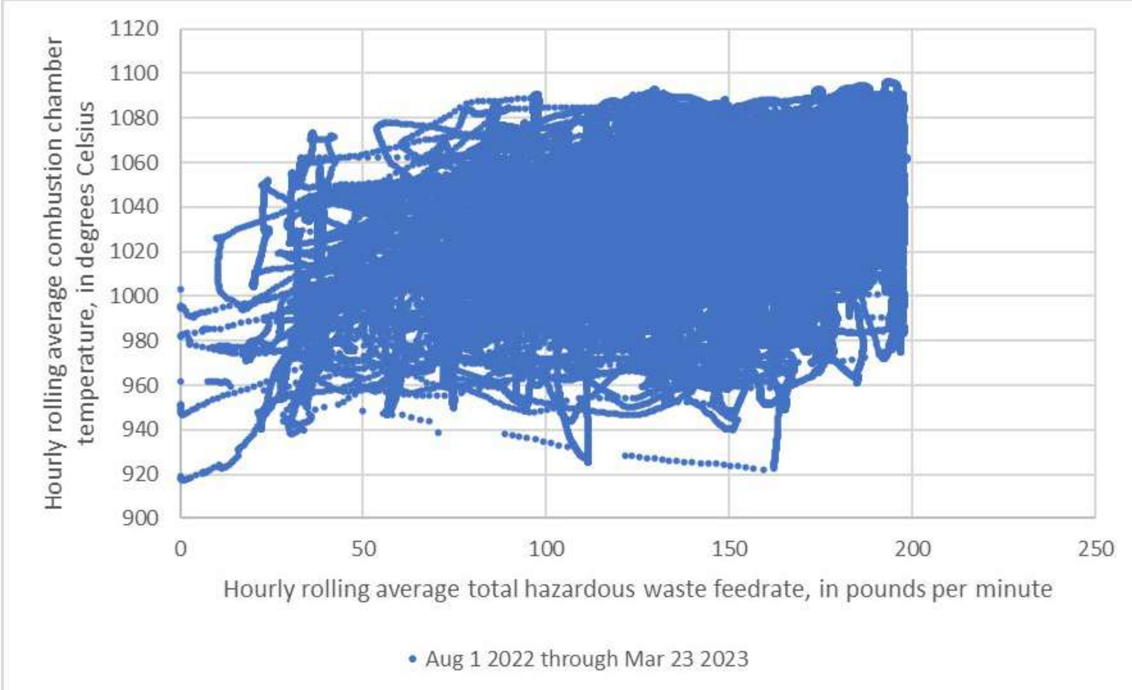
NEIC inspectors asked Bayer representatives where in the HWC MACT multiple test conditions are allowed to establish different OPLs for the same pollutant, unless they were setting different OPLs based on different "modes of operation," as specified in 40 CFR § 63.1207(g)(1)(ii) and 40 CFR § 63.1209(q). Bayer representatives stated they were not relying on different modes of operation and instead established one set of OPLs using two test conditions to cover the extreme range of normal conditions. Bayer representatives provided NEIC inspectors EPA's September 2005 "Technical Support Document for HWC MACT Standards" (**Appendix P**) in support of this approach.

The EPA Technical Support Document (TSD) for HWC MACT Standards states the following (**Appendix P**, pg. 139):

> *there may be unique instances where due to the interdependence of certain parameters, it may not be possible to simultaneously achieve 'worst-case' levels for all operating parameters (for example, for some venturi scrubber designs, minimum venturi pressure drop and maximum flue gas flowrate). In these cases, it may be necessary to test two or more sets of conditions under the same operating mode. Operating parameters should be kept as similar as possible in the conditions. The test plan should identify the conflicting parameters, reasons for conflict, and changes in operating parameters that will be made to allow for testing at worst case for the conflicting parameters.*

Observation 3
Thus, the TSD supports the concept for conducting more than one test condition under a single mode of operation. However, the TSD also states (**Appendix P,** pg. 139) that “[i]t is anticipated that in most situations it will be possible to operate in a single mode under which ‘worst-case’ levels for all operating parameters are simultaneously achieved” and gives the following example, “operation at minimum combustion temperature and maximum waste feedrate and flue gas flowrate through adjustment of auxiliary fuel and excess air levels.” These are the exact same set of parameters that Bayer representatives claimed as the basis for needing the two test conditions for their CPT, contrary to the example in the TSD, which indicates combustion temperature could be managed at maximum waste feedrates in a single test condition. Further, the test plan for the 2019 CPT (**Appendix Q**) does not “identify the conflicting parameters, reasons for conflict, and changes in operating parameters that will be made to allow for testing at worst case for the conflicting parameters,” as stated in the TSD (pg. 139). While the test plan says (pg. 9), “[t]hese two test conditions represent the extreme range of normal conditions, which is consistent with the requirements of 40 CFR § 63.1207(g),” it does not include a description or supporting information related to the conflicting parameters that would necessitate separate test conditions. In addition, NEIC requested operating data for TO II from January 1, 2022-March 23, 2023, and plotted the observed hourly rolling averages of combustion chamber temperature and total hazardous waste feedrate for the period August 1, 2022-March 23, 2023 (the number of data points was limited to 50,000) (**Appendix R**). As shown below, the plotted data do not demonstrate that combustion chamber temperature increases with increasing hazardous waste feedrate. As the previously referenced TSD example suggested, during normal operations (i.e., not during the CPT), there may be other process adjustments that are made that affect combustion temperature, including adjusting auxiliary fuel, excess air, and/or the ratio of aqueous to organic waste feedrates.

Observation 3



As discussed above, when NEIC inquired why two test conditions were necessary, Bayer representatives stated that at the high range of hazardous waste feedrate, the combustion temperature was also high, so two test conditions were needed to set a minimum combustion chamber temperature at a substantially lower hazardous waste feedrate. However, based on the actual operating data, it does not appear there is a demonstrated relationship between hazardous waste feedrate and combustion chamber temperature that supports this premise or that is not countered by other process differences.

Further, if there was direct relationship between total hazardous waste feedrate and combustion chamber temperature, it would likely be related to the higher British thermal unit (Btu) load at the higher waste feedrates. However, since Bayer feeds two different waste types to TO II (organic and aqueous), the overall heat value of the hazardous waste could be controlled such that a higher feedrate (in lb/min) could be achieved without substantially increasing the Btu load by introducing more aqueous waste and less organic waste, with natural gas used to ensure sufficient heat content for combustion. According to the test plan for the 2019 CPT (**Appendix Q**), the difference in heating values between “typical” organic and aqueous waste is substantial: organic waste heating values range from 11,700-13,900 British thermal units per pound (Btu/lb) while aqueous waste values range from 1,100-1,500 Btu/lb.

Based on the 2019 CPT Report (**Appendix N**), the feedrate ratio of aqueous waste to organic waste was targeted to be 3.0 in Condition I and was actually 3.6, and the ratio was targeted to be 1.5 in Condition II and was actually 1.1. Bayer representatives provided NEIC monthly totals of aqueous and organic waste incinerated on-site for the period of January 2020-February 2023. Analysis of the monthly totals indicates the monthly feedrate ratio of aqueous waste to organic waste ranged from 2.14 to 6.12, demonstrating that during some months, Bayer fed more than six times the amount of aqueous waste than organic waste to the incinerator (**Appendix S**). Although the surrogate organic waste used during the 2019 CPT

Observation 3
had a heating value higher than the “typical” facility organic waste (fuel oil no. 2 was used as a surrogate and has a heating value of approximately 18,000 Btu/lb), Bayer may have been able to maintain temperature control by loading six times more aqueous waste than organic waste (a substantial increase from the previously stated actual ratios of 3.6 in Condition I and 1.1 in Condition II). Furthermore, it is unclear why Bayer selected a surrogate organic waste with a significantly higher heating value compared to the “typical” organic waste. As shown in the “2019 CPT Operating Rates for TO II” table above, while Condition I of the CPT did have a higher feedrate ratio of aqueous to organic hazardous waste, Condition I still had a much higher overall organic waste feedrate than Condition II (by a factor greater than five). The higher feedrate of organic hazardous waste in Condition I may have been necessary to introduce higher levels of waste constituents and/or spiked components (e.g., tetrachloroethene was spiked into the waste line to maximize chlorine feedrates) during the Condition I test to set those OPLs (**Appendix N**). If that was the case, however, the lower organic hazardous waste feedrate during Condition II would be even less representative of the waste and constituent feed rates established as OPLs during Condition I (i.e., the chlorine feedrate was 500 lb/hr during Condition I compared to 174 lb/hr during condition II, and both Condition I and Condition II were used to demonstrate compliance with the D/F emission standards). The large differences in constituent feedrates between the two conditions do not align with the TSD’s specifications that, “[o]perating parameters should be kept as similar as possible in the conditions” (**Appendix P**, pg. 139). Moreover, all applicable operating parameters for the D/F standard are not similar between Condition I and Condition II. Compared to Condition I, the Condition II test to set the OPL for minimum combustion chamber temperature was conducted at a combustion chamber temperature nearly 200 °C lower, with a hazardous waste feedrate more than an order of magnitude lower, and an inlet gas flowrate 36% lower. Hence, none of the parameters used as OPLs for the D/F standard are similar between Condition I and Condition II, as specified in the TSD. The HWC MACT requires CPTs be conducted no later than 61 months after the previous CPT. Because the most recent CPT was conducted in June 2019, the next CPT for TO II is required by July 2024. Under the HWC MACT, CPT plans are required to be submitted for review and approval no later than one year prior to scheduled date of that upcoming CPT. As such, the CPT plan for the next CPT for TO II should be submitted no later than July 2023. Given the timing of NEIC’s inspection and observations, the Region should have the opportunity to consider this observation when reviewing the next CPT plan as it relates to target test conditions described in the CPT plan.

Observation 4
Observation Summary: The TO II combustion chamber temperature, inlet gas flowrate, and total hazardous waste feedrate during CPT Condition II were observed in less than one percent of Bayer’s actual operating data.
Citation:

Observation 4

40 CFR Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors

40 CFR § 63.1201 Definitions and acronyms used in this subpart.

Operating requirements means operating terms or conditions, limits, or operating parameter limits developed under this subpart that ensure compliance with the emission standards.

40 CFR § 63.1206 When and how must you comply with the standards and operating requirements?

(c) Operating requirements —

(1) General.

(i) *You must operate only under the operating requirements specified in the Documentation of Compliance under § 63.1211(c) or the Notification of Compliance under §§ 63.1207(j) and 63.1210(d)*

(ii) *The Documentation of Compliance and the Notification of Compliance must contain operating requirements including, but not limited to, the operating requirements in this section and § 63.1209*

(iii) *Failure to comply with the operating requirements is failure to ensure compliance with the emission standards of this subpart;*

40 CFR § 63.1207 What are the performance testing requirements?

(a) General. *The provisions of § 63.7 apply, except as noted below.*

(b) Types of performance tests —

(1) *Comprehensive performance test. You must conduct comprehensive performance tests to demonstrate compliance with the emission standards provided by this subpart, establish limits for the operating parameters provided by § 63.1209, and demonstrate compliance with the performance specifications for continuous monitoring systems.*

(d) Frequency of testing. *Except as otherwise specified in paragraph (d)(4) of this section, you must conduct testing periodically as prescribed in paragraphs (d)(1) through (d)(3) of this section. The date of commencement of the initial comprehensive performance test is the basis for establishing the deadline to commence the initial confirmatory performance test and the next comprehensive performance test. You may conduct performance testing at any time prior to the required date. The deadline for commencing subsequent confirmatory and comprehensive performance testing is based on the date of commencement of the previous comprehensive performance test. Unless the Administrator grants a time extension under paragraph (i) of this section, you must conduct testing as follows:*

Observation 4
(1) *Comprehensive performance testing. Except as otherwise specified in paragraph (d)(4) of this section, you must commence testing no later than 61 months after the date of commencing the previous comprehensive performance test used to show compliance with § 63.1216, § 63.1217, § 63.1218, § 63.1219, § 63.1220, or § 63.1221…* **(g) Operating conditions during testing.** *You must comply with the provisions of § 63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of § 63.7(e)(1) to conduct performance testing under representative operating conditions.* **40 CFR § 63.1209 What are the monitoring requirements?** **(k) Dioxins and furans.** *You must comply with the dioxin and furans emission standard by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.* **(2) Minimum combustion chamber temperature.** **(i)** *For sources other than cement kilns, you must measure the temperature of each combustion chamber at a location that best represents, as practicable, the bulk gas temperature in the combustion zone. You must document the temperature measurement location in the test plan you submit under §§ 63.1207(e) and (f);* **(ii)** *You must establish a minimum hourly rolling average limit as the average of the test run averages.* **(3) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.* **(ii)** *You must comply with this limit on a hourly rolling average basis;* **(4) Maximum hazardous waste feedrate.** **(i)** *You must establish limits on the maximum pumpable and total (pumpable and nonpumpable) hazardous waste feedrate for each location where waste is fed.* **(ii)** *You must establish the limits as the average of the maximum hourly rolling averages for each run.* **(iii)** *You must comply with the feedrate limit(s) on a hourly rolling average basis;*
Evidence:

Observation 4
Observation 3 **Appendix N** – Bayer CropScience 2019 CPT Report **Appendix R** – TO II Operating Data January 2022-March 2023

Description of Observation: As described in Observation 3, TO II is subject to the HWC MACT, and the most recent CPT to demonstrate compliance with emission standards and establish OPLs under the HWC MACT for TO II was conducted by Bayer during the week of June 3, 2019 (**Appendix N**). Bayer's 2019 CPT was designed and conducted with two test conditions and the reported results of the CPT showed compliance with the HWC MACT emission standards that were tested under each condition. See Observation 3 for more information regarding the two test conditions.

According 40 CFR § 63.1209(k), the applicable OPLs for the D/F standard for an incinerator with TO II's configuration are minimum combustion temperature, maximum flue gas flow rate, and maximum hazardous waste feedrate. The table below lists the average operating rates for these parameters as averaged over three test runs during both Condition I and Condition II of the 2019 CPT.

2019 CPT Operating Rates for TO II			
Operating Parameter	Units	Condition I	Condition II
Combustion Chamber Temperature	°C	1,020	825
Inlet Gas Flowrate	scfm	8,229	5,240
Hazardous Waste Feedrate	lb/min	198	19

As described in Observation 3, NEIC inspectors raised a concern to Bayer representatives about the large disparity between the actual minimum combustion chamber temperature, inlet gas flowrate, and hazardous waste feedrate (i.e., the D/F OPLs) maintained during the 2019 CPT Condition I and Condition II and requested operating data for TO II from January 1, 2022-March 23, 2023. NEIC evaluated whether the operating rates during the 2019 CPT for the applicable D/F OPLs reflected the observed range of normal operations for TO II by comparing the observed operating data to test conditions during the 2019 CPT. From the observed operating data, NEIC determined the minimum, first percentile (1^{st} percentile; i.e., the observed data value that exceeds 1% of observed data in the period and is exceeded by 99% of observed data in the period), average, median, and maximum values of the combustion chamber temperature, flue gas flow rate, and total hazardous waste feedrate for time periods where instantaneous hazardous waste feedrate was greater than zero. Time periods where instantaneous hazardous waste feedrate was equal to zero were excluded from the analysis. NEIC compiled this data in a Microsoft Excel Spreadsheet (**Appendix R**).

As displayed in the table below, observed combustion chamber temperatures were almost always (more than 99% of the time) at least 100 °C greater than the CPT Condition II combustion chamber temperature of 825 °C (which was set as the OPL), observed inlet gas flow rates were almost always (more than 99% of the time) greater than the CPT Condition II flue gas flow rate of 5,240 scfm, and observed total hazardous waste feedrates were almost always (more than 99% of the time) greater than the CPT Condition II hazardous waste

Observation 4

feedrate of 19 lb/min. By comparison, CPT Condition I was tested at a combustion chamber temperature (1,020 °C) close to the average of the observed operating data and at an inlet gas flowrate (8,229 scfm) and total hazardous waste feed rate (198 lb/min) close to or exceeding the maximum respective value in the observed operating data.

Observed Operating Data, January 1, 2022-March 23, 2023, One-hour Rolling Averages[1]						
Operating Parameter	Units	Minimum	1st percentile	Average	Median	Maximum
Combustion chamber temperature	°C	830	960	1,029	1,032	1,096
Flue gas flow rate (as inlet gas flow rate)	scfm	4,594	5,370	7,082	7,188	7,885
Total hazardous waste feedrate	lb/min	0.00	36	148	153	199

[1] One-minute periods where instantaneous hazardous waste feedrate was equal to zero were excluded from this analysis.

The HWC MACT requires CPTs be conducted no later than 61 months after the previous CPT. Because the most recent CPT was conducted in June 2019, the next CPT for TO II is required by July 2024. Under the HWC MACT, CPT plans are required to be submitted for review and approval no later than one year prior to scheduled date of that upcoming CPT. As such, the CPT plan for the next CPT for TO II should be submitted no later than July 2023. Given the timing of NEIC's inspection and observations, the Region should have the opportunity to consider this observation when reviewing the next CPT plan as it relates to target test conditions described in the CPT plan.

Observation 5

Observation Summary: The actual chlorine feedrate used during the 2019 CPT was less than the normal chlorine feedrate based on the facility's average chlorine feedrate during normal operations.

Citation:

40 CFR Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors

40 CFR § 63.1207 What are the performance testing requirements?

(g) *Operating conditions during testing. You must comply with the provisions of § 63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of § 63.7(e)(1) to conduct performance testing under representative operating conditions.*

(1) *Comprehensive performance testing —*

Observation 5
(i) *Operations during testing. For the following parameters, you must operate the combustor during the performance test under normal conditions (or conditions that will result in higher than normal emissions):* **(A)** *Chlorine feedrate. You must feed normal (or higher) levels of chlorine during the dioxin/furan performance test;*
Evidence: **Appendix Q –** Bayer CropScience Test Plan for 2019 CPT **Appendix N –** Bayer CropScience 2019 CPT Report
Description of Observation: The test plan for the 2019 CPT (**Appendix Q,** pg. 51) states "40 CFR § 63.1207(g)(1)(A) requires that Bayer feed normal or higher levels of chlorine during the D/F performance test. The chlorine feed rate will be maximized during Condition I. This chlorine feed rate meets the requirement of 40 CFR § 63.1207(g)(1)[i](A)." The target chlorine rate for the 2019 CPT Condition I was 450 lb/hr. The test plan (**Appendix Q**, pg. 52) also says "For the confirmatory performance test (CfPT) conducted in 2017, Bayer determined that the annual average chlorine feed rate was 185 lb/hr. The chlorine feed rate will be maintained at this level during Condition II to meet the requirement of 40 CFR § 63.1207(g)(1)[i](A)." The target chlorine rate for the 2019 CPT Condition II was 185 lb/hr, presumably since this would represent a normal chlorine feedrate. According to the 2019 CPT report (**Appendix N**), the average actual chlorine feedrates during the CPT were 500 lb/hr during Condition I test runs and 174 lb/hr during Condition II test runs. Specifically, for each Condition II test run, the average actual chlorine feedrates were 174, 175, and 175 lb/hr, respectively. Thus, the actual chlorine rates during Condition II of the 2019 CPT were less than 185 lb/hr, which is the annual average chlorine feedrate as determined by the facility (**Appendix Q**). As a result, the actual chlorine feedrate during Condition II was less than the feedrate required in 40 CFR § 63.1207(g)(1)(i)(A). The 2019 CPT report does not discuss the actual chlorine feedrate as being less than the targeted annual average chlorine feedrate in the "Condition II Deviations from Comprehensive Performance Test Plan" section (pg. 24), which states in totality, "The operating conditions achieved during Condition II were similar to the targets established in the CPT plan. The key operating parameter for this test condition was combustion chamber temperature. The combustion chamber temperature was very close to target" (**Appendix N**).

Observation 6
Observation Summary: The correlation between inlet gas flowrate and stack gas flowrate for TO II is based on data that were collected when the rich gas header was still in use and the vent gas incinerator (VGI) did not exist to control process vent streams.
Citation: **40 CFR Part 63, Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors** **40 CFR § 63.1209 What are the monitoring requirements?** **(j) DRE.** *To remain in compliance with the destruction and removal efficiency (DRE) standard, you must establish operating limits during the comprehensive performance test (or during a previous DRE test under provisions of § 63.1206(b)(7)) for the following parameters, unless the limits are based on manufacturer specifications, and comply with those limits at all times*

Observation 6
that hazardous waste remains in the combustion chamber (i.e., the hazardous waste residence time has not transpired since the hazardous waste feed cutoff system was activated): **(2) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.* **(k) Dioxins and furans.** *You must comply with the dioxin and furans emission standard by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.* **(3) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.* **(m) Particulate matter.** *You must comply with the particulate matter emission standard by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.* **(2) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.* **(n) Semivolatile metals and low volatility metals.** *You must comply with the semivolatile metal (cadmium and lead) and low volatile metal (arsenic, beryllium, and chromium) emission standards by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.* **(5) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for*

Observation 6
each run. **(o) Hydrogen chloride and chlorine gas.** *You must comply with the hydrogen chloride and chlorine gas emission standard by establishing and complying with the following operating parameter limits. You must base the limits on operations during the comprehensive performance test, unless the limits are based on manufacturer specifications.* **(2) Maximum flue gas flowrate or production rate.** **(i)** *As an indicator of gas residence time in the control device, you must establish a limit on the maximum flue gas flowrate, the maximum production rate, or another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time, as the average of the maximum hourly rolling averages for each run.*
Evidence: Observations 3 and 4 **Appendix Q** – Bayer CropScience Test Plan for 2019 CPT **Appendix N** – Bayer CropScience 2019 CPT Report
Description of Observation: As discussed in Observations 3 and 4, several pollutants under the HWC MACT require that a maximum flue gas flowrate (or production rate) be established during CPTs as an OPL for monitoring compliance. This OPL is a measure of residence time for gases in the incinerator. The HWC MACT [40 CFR § 63.1209(o)(2)(i)] also allows for facilities to establish "another parameter that you document in the site-specific test plan as an appropriate surrogate for gas residence time." Bayer has not established an OPL for flue gas flowrate (or production rate) and has instead used inlet gas flowrate as a surrogate for gas residence time. The test plan for the 2019 CPT (**Appendix Q**, pg. 23) states that "Inlet gas flow rate for the TO II is defined as the sum of the lean gas vent flow rate and the rich gas vent flow rate. Because stack gas flow rate is inversely proportional to gas residence time, a correlation between gaseous flow rate into the incinerator and stack gas flow rate will demonstrate that inlet gas flow rate is an adequate surrogate for gas residence time." The test plan includes a chart demonstrating a correlation between inlet gas flow rate and stack gas flow rate, and the chart states that data points are from CPTs and CfPTs conducted in the years 2004-2017. Following the chart, the test plan (**Appendix Q**, pg. 24) further states: *[The chart discussed] shows that there is a direct correlation between inlet gas flow rate and stack gas flow rate for the TO II. In the normal operating range for the TO II, this relationship is approximately linear. Bayer believes that this figure demonstrates that inlet gas flow rate can be used as an indicator of flue gas flow rate. As the inlet gas flow rate increases, the stack flow rate increases almost proportionally and will therefore provide an adequate indication of the gas residence time. Monitoring of inlet gas flow rate as an indicator of gas residence time was approved for the previous CPT plans. Bayer is proposing to maintain this monitoring scheme.* Later (**Appendix Q**, pg. 32), the test plan states that "The rich gas vent system is currently idled." NEIC inspectors were also told by Bayer representatives during the on-site inspection that the rich gas header is no longer used.

Observation 6

As discussed previously in this report, the VGI is the primary control device for the lean gas header, and TO II is the backup control device for process vent streams. Thus, for most of the time during normal operations, no lean gas is being incinerated in TO II, and the inlet gas is only combustion air. During the 2019 CPT, “only combustion air was fed through the lean gas vent stream” (**Appendix N,** pg. 30).

Because the correlation between inlet gas and stack gas flow rates was determined using data from CPTs and CfPTs conducted when the rich gas header was still in use and the VGI did not exist to control the lean gas header, the correlation may no longer be a valid surrogate for gas residence time in TO II based on facility’s current configuration (combustion air as the only inlet gas to TO II most of the time). In addition, Bayer did not document or present any data in the 2018 test plan for the current inlet gas flow configuration that inlet gas flow is an appropriate surrogate for gas residence time.