VEOLIA
ENVIRONMENTAL SERVICES

January 28, 2014
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ENFORCEMENT BRANCH

Attn: Compliance Tracker, AE-17J
Air Enforcement and Compliance Assurance Branch
United States Environmental Protection Agency
Region 5
77 W. Jackson Blvd., AE-17J
Chicago, IL 60604

RE: Veolia ES Technical Solutions, L.L.C.
163121AAP
40 CFR Part 63 – Subpart EEE
National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors
Comprehensive Performance Test Reports and Notification of Compliance (NOC)

Compliance Tracker,

Pursuant to the requirements of 40 CFR 63.1200, subpart EEE, Veolia ES Technical Solutions, L.L.C., hereby submits the Performance Test Reports for Incinerators 2, 3 and 4 and the Notification of Compliance (NOC). The NOC documents compliance with the emission standards and continuous monitoring system requirements, and identifying operating parameters defined in 40 CFR 63.1209 and 63.1219. Veolia is now complying with all operating requirements specified in this NOC. The Performance Test Reports detail compliance with these standards.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Upon review of this submittal, should the Agency have a need for additional information or questions, please contact Dennis Warchol at (618) 271-2804 or via e-mail at dennis.warchol@veolia.com or me at (618) 271-2804 or via e-mail at doug.harris@veolia.com.

Sincerely,
Veolia ES Technical Solutions, L.L.C.

Doug Harris
General Manager

Att.

cc: Mr. George Czerniak, Director, Air and Radiation Division
USEPA File

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Notification of Compliance with the Final Replacement Standards of the National Emission Standards for Hazardous Air Pollutants for Hazardous Waste Combustors (40 CFR 63, Subpart EEE)

Veolia ES Technical Solutions, L.L.C.
Sauget, Illinois

Veolia ES Technical Solutions, L.L.C.
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Sauget, Illinois 62201

January 28, 2013

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1.0 Certification Statement

I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Doug Harris Date: 1/28/2014

Doug Harris
General Manager
Veolia ES Technical Solutions, L.L.C.
Sauget, Illinois

2.0 Introduction

Veolia ES Technical Solutions, L.L.C. (Veolia) operates three incinerators at its Sauget, Illinois facility. Two of the incinerators are fixed hearth units (Units 2 and 3), and the third incinerator is a rotary kiln unit (Unit 4). All of the incinerators treat certain wastes that are classified as hazardous under state and/or federal regulations, and are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Hazardous Waste Combustors (Title 40 of the Code of Federal Regulations, Part 63 [40 CFR Part 63], Subpart EEE), (i.e., the HWC MACT).

A subsequent Comprehensive Performance Test (CPT) of the three incinerators at Veolia's Sauget facility was completed on October 30, 2013. The CPT demonstrated applicable emission standards and established OPLs as required by the HWC MACT for dioxins/furans, THC, CO, particulate matter (PM), hydrochloric acid and chlorine gas (HCl/Cl_2), mercury, SVM, and LVM. Compliance with the DRE standard (99.99% DRE) is demonstrated using data from previous RCRA trial burns. The subsequent CPT began with the performance of RATAs of the CO and O_2 continuous monitoring systems (CEMS). The RATA of the CO and O_2 CEMS of Unit 4 was performed on September 4, 2013. The RATA of the CO and O_2 CEMS of Unit 3 was performed on September 5, 2013, and the RATA of the CO and O_2 CEMS of Unit 2 was performed on September 6, 2013. The results of the CPT are presented in an accompanying report, *Comprehensive Performance Test Report for Fixed Hearth – Unit 2 Fixed Hearth – Unit 3 Rotary Kiln Incinerator – Unit 4* (CPT Report). In accordance with 40 CFR §63.1207(j)(1)(i) and §63.1207(j)(3), the Notification of Compliance (NOC) and CPT Report are being filed within 90 days of completion of the CPT.

2.1 Test Objectives

The subsequent CPT for the Final Replacement Standards of the HWC MACT for the three incinerators at Veolia Sauget was designed and conducted to demonstrate compliance with the standards and associated OPLs of the HWC MACT for existing incinerators at §63.1219. The CPT:

- Demonstrated that the incinerators meet the applicable HWC MACT emission limits while treating hazardous waste; and
- Re-established operating parameter limits (OPLs) on key operating variables that will ensure that the incinerator operates within the HWC MACT emission limits while treating hazardous waste.

The test program included feeding liquid and solid waste materials to the incinerators, sampling and analyzing the feedstreams, spiking waste feedstreams with metals and chlorine, monitoring certain process parameters, conducting emissions testing, and sampling of waste streams and spiking materials. Applicable emissions standards for the incinerators at Veolia Sauget under the HWC MACT regulations are summarized in Table 2-1.

Table 2-1. HWC MACT Standards

HAP or HAP Surrogate	Final Replacement Standards
Destruction and Removal Efficiency	99.99%
Dioxins/Furans	0.20 ng TEQ/dscm – Units 2 and 3 [1] 0.40 ng TEQ/dscm – Unit 4 [1, 2]
Particulate Matter	0.013 gr/dscf, at 7% O_2
Mercury	130 μg/dscm, at 7% O_2
SVM (Semivolatile metals, Cd, Pb)	230 μg/dscm, at 7% O_2
LVM (Low volatility Metals, As, Be, Cr)	92 μg/dscm, at 7% O_2
HCl/Cl_2	32 ppmv, dry, at 7% O_2, as chloride equivalents.
CO	100 ppmv, dry, at 7% O_2
Hydrocarbons	10 ppmv, dry, at 7% O_2

[1] Toxicity Equivalents – relating the relative concentrations and toxicity of the dioxin and furan congeners and isomers to the toxicity of 2,3,7,8 tetrachlorodibenzodioxin.

[2] The initial particulate matter control device is a baghouse, and the OPL for the maximum inlet temperature to the baghouse of Unit 4 is 399°F (i.e., less than 400°F). During the CPT, the average of the test run averages (during the sampling for Dioxins/Furans) was 399°F.

The objectives for the subsequent CPT for the Final Replacement Standards of the HWC MACT for each of the three incinerators were to:

- Demonstrate compliance with stack gas emissions less than or equal to the following limits, corrected to 7% O_2:
  - — Carbon Monoxide: 100 ppmv, dry;
  - — Total Hydrocarbons: 10 ppmv, dry;
  - — Dioxins/Furans: 0.20 ng TEQ/dscm for Units 2 and 3, and 0.40 ng TEQ/dscm for Unit 4;
  - — Particulate Matter (PM): 0.013 grains/dscf;
  - — Mercury: 130 μg/dscm;
  - — Semivolatile Metals (SVM) (Cd and Pb combined): 230 μg /dscm;
  - — Low Volatility Metals (LVM) (As, Be and Cr combined): 92 μg /dscm; and
  - — Hydrogen Chloride/Chlorine (HCl/Cl_2): 32 ppmv as Cl^- equivalent, dry.
- Compliance with the DRE standard (99.99% DRE) is demonstrated using data from previous RCRA trial burns.

- Establish limits for operating parameters.
- Conduct a Continuous Monitoring System (CMS) performance evaluation test.
- Conduct a Relative Accuracy Test Audit (RATA) for the CO and O_2 Continuous Emissions Monitoring Systems (CEMS.

2.2 CPT Schedule

The subsequent CPT of the three incinerators at the Sauget facility began with the performance of RATAs of the CO and O_2 continuous monitoring systems (CEMS). The RATA of the CO and O_2 CEMS of Unit 4 was performed on September 4, 2013. The RATA of the CO and O_2 CEMS of Unit 3 was performed on September 5, 2013, and the RATA of the CO and O_2 CEMS of Unit 2 was performed on September 6, 2013.

The subsequent CPT of Unit 2 was begun October 8, 2013. Run 1 of the test was completed on this day. Run 2 was performed on October 9, 2013, but only results associated with the standard for particulate matter are reported (i.e., the first part of the run). The second run, identified as Run 3, was performed on October 10, 2013. The third run of the second part of the test, for HCl/Cl_2, metals, and dioxins/furans, (i.e., Run 5) was performed on October 30, 2013.

The subsequent CPT of Unit 3 was begun October 15, 2013. The first part of Run 1, for PM, was completed on this day. Testing for HCl/Cl_2, metals, and dioxins/furans, had to be repeated. Run 2 was performed on October 16, 2013, and Run 3 was performed on October 17, 2013. The third successful run of the second part of the test of Unit 3 for HCl/Cl_2, metals, and dioxins/furans (i.e., Run 4) was performed on October 18, 2013.

The subsequent CPT of Unit 4 was begun October 23, 2013 with the completion of Run 1. Run 2 was performed on October 24, 2013. Results for HCl/Cl_2, metals, and dioxins/furans are reported for Run 2. PM results for Run 2 are not reported. Run 3 was performed on October 25, 2013. The third (accepted) run for PM (i.e., Run 4) was performed at the conclusion of Run 3 for PM.

3.0 Unit Descriptions

Veolia operates two Fixed Hearth Dual Chambered Incinerators (Units 2 and 3) and one rotary kiln incinerator (Unit 4) at the Sauget, IL facility. The two fixed hearth units are rated at 16 million Btu/hr each. Unit 3 is a mirror image of Unit 2. Both of these units have their own waste handling systems.

Units 2 and 3 feature a two-stage combustion process. Ignition of waste material takes place in the primary (lower) combustion chamber (PCC). A secondary (upper) combustion chamber (SCC) serves as an "afterburner" for process gases. Liquid wastes, organic and aqueous, and solid wastes are fed to the PCC. Air-atomizing injectors are used for injection of high-Btu liquids, low-Btu liquids and specialty feed liquids. Solids, usually packaged in plastic or fiberboard containers, are introduced into the incinerator through a PLC controlled airlock-ram system located at the lower front of the PCC.

The air pollution control systems of Units 2 and 3 consist of a spray dryer absorber and fabric filter baghouse modules. The air pollution control system neutralizes acidic compounds and removes particulate matter from the exhaust gas. Two subsystems, the spray dryer absorber and the fabric filter, carry out the chemical neutralization and particulate removal functions, respectively. An induced draft fan and stack provide the mechanical energy required to transport the flue gas through the interconnecting ductwork, to its eventual discharge point to atmosphere. The only difference between Units 2 and 3 is that Unit 2 is equipped with four (4) baghouse modules, while Unit 3 is equipped with three (3) baghouse modules. However, each incinerator is operated identically with only three baghouse modules in service during operation.

A complete description of Units 2 and 3 is provided in the CPT Plan. A process flow diagram for Unit 2 is presented in Figure 3-1, and a process flow diagram for Unit 3 is presented in Figure 3-2.

Unit 4 is rated at 50 million Btu/hr and is equipped with its own tank farm system, drum storage, bulk solids storage and feed systems. Unit 4 includes a rotary kiln as the PCC, and a SCC. Liquids are fed to either the kiln PCC or the SCC. Bulk solid wastes are fed to the kiln through the ram feeder. Containerized wastes are fed to the kiln through the ram feeder or the auxiliary ram feeder. The liquid waste injectors used in the combustion chambers are air-atomizing injectors, and are used for injection of pumpable sludges, aqueous wastes and organic liquid wastes to the kiln and for injection of organic liquid waste to the SCC.

The air pollution control system consists of a tempering chamber, two spray dryer absorbers, and fabric filter baghouse modules with carbon injection. The air pollution control system neutralizes acidic compounds and removes particulate from the exhaust gas. Two subsystems, the spray dryer absorber and the fabric filter, carry out the chemical neutralization and particulate removal functions, respectively. An induced draft fan and stack provide the mechanical energy required to transport the flue gas through the interconnecting ductwork, to its eventual discharge point to atmosphere.

A complete description of Unit 4 is provided in the Comprehensive Performance Test Plan. A process flow diagram for Unit 4 is presented in Figure 3-3.

Figure 3-1. Unit 2 Process Flow Diagram

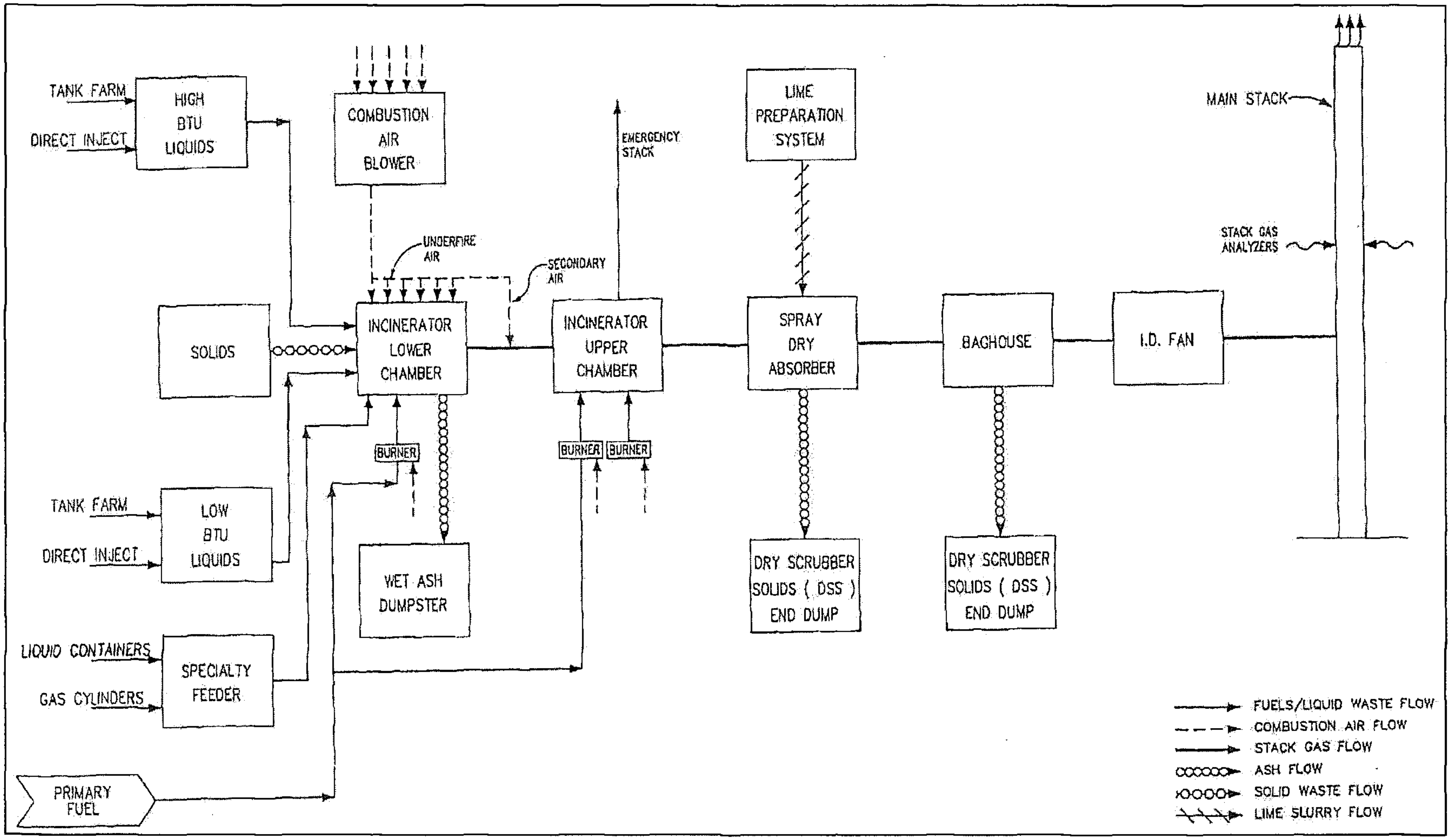


Figure 3-2. Unit 3 Process Flow Diagram

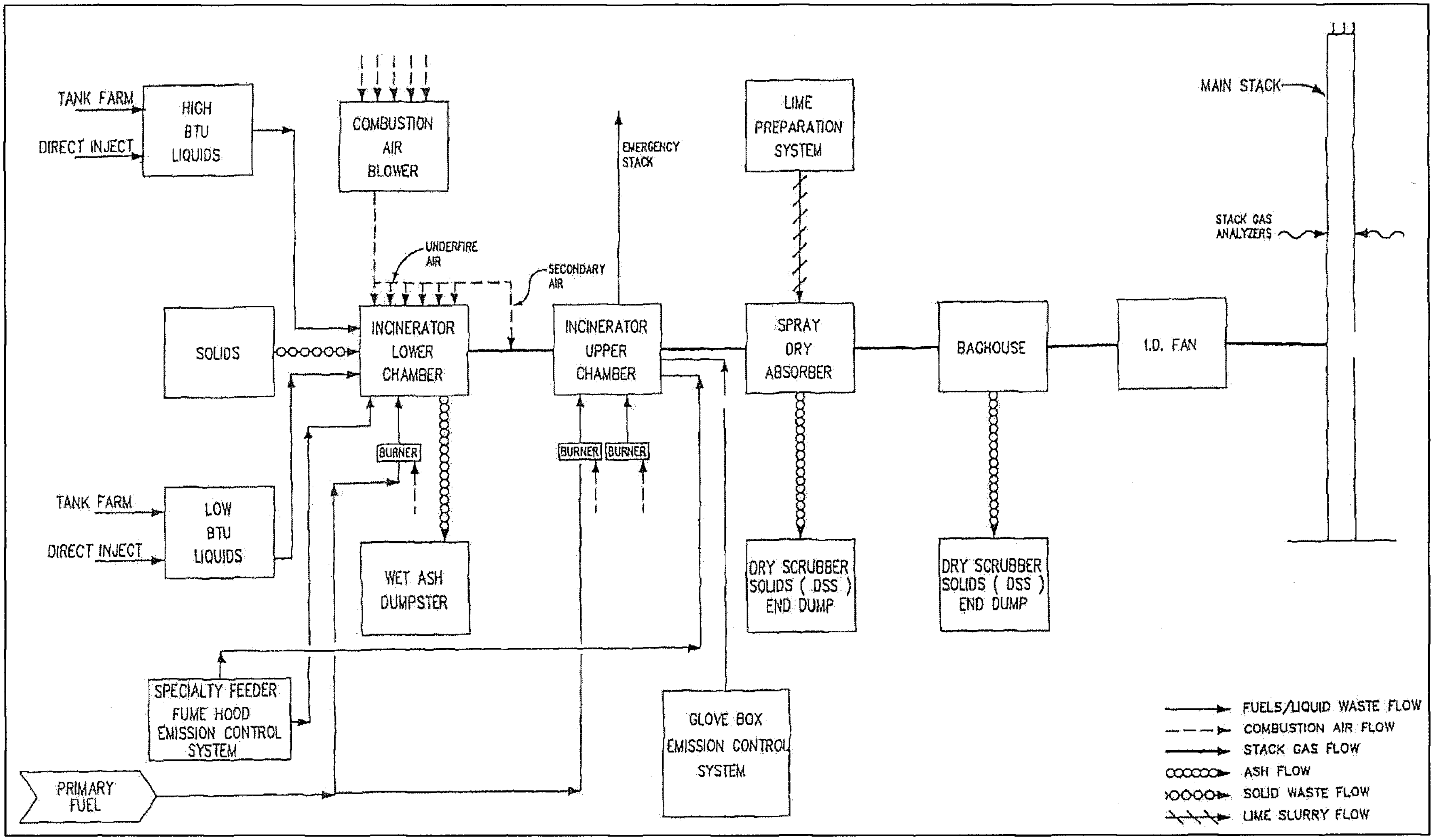
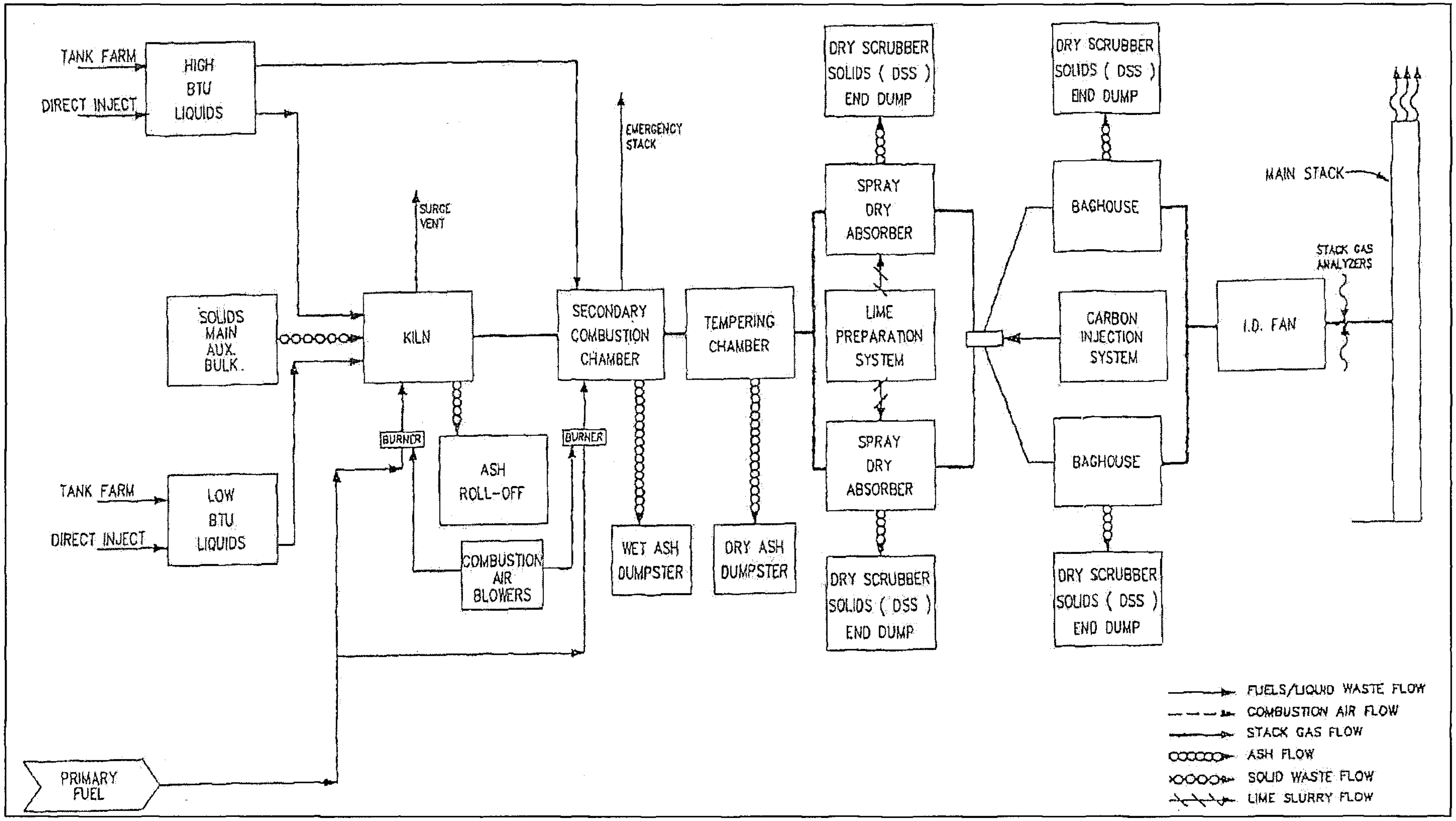


Figure 3-3. Unit 4 Process Flow Diagram



4.0 Results of the Comprehensive Performance Test

In August and September of 2008, Veolia conducted tests of Units 2, 3, and 4 required by the information collection requests from U.S. EPA Region 5 dated June 5, 2008 and September 12, 2008. Those tests began on August 11, 2008 for Unit 2, August 5, 2008 for Unit 3, and August 21, 2008 for Unit 4 following test plans approved by U.S. EPA Region 5. Initial Comprehensive Performance Tests (CPTs) of Units 2, 3, and 4 commenced on December 8, 2009 for Unit 2; on December 1, 2009 for Unit 3; and on December 16, 2009 for Unit 4, and were performed in accordance with Comprehensive Performance Test Plans approved by U.S. EPA Region 5. The HWC MACT, at 40 CFR § 63.1207(d), states *"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."* EPA Region 5 considers that the start of the subsequent CPTs be based on the initiation of the metals tests performed in 2008, requiring that the subsequent CPT be started by September 5, 2013, and that a site-specific test plan be submitted before this date. Veolia originally submitted to EPA its notification of intent and site-specific test plans (i.e., comprehensive performance test plans) for all three units and a Quality Assurance Project Plan (QAPjP) for the subsequent CPT on September 5, 2012. Revisions to the CPT Plans and QAPjP were made based on negotiations with EPA Region 5. The CPT Plan and QAPjP dated September 25, 2013 were approved by EPA Region 5, and the subsequent CPT for Units 2, 3, and 4 was conducted in accordance with these plans.

EPA Region 5 considers that testing of all three of the incinerators comprises the CPT for Veolia's facility in Sauget. Veolia Sauget started the CPT of the three incinerators at the Sauget facility on September 4, 2013 with the performance of the RATA of the CO and O_2 CEMS of Unit 4. Testing for the applicable parameters of the HWC MACT including dioxins/furans, total hydrocarbons (THC), carbon monoxide (CO), particulate matter (PM), hydrogen chloride/chlorine gas (HCl/Cl_2), mercury, SVM, and LVM was completed on October 30, 2012. The HWC MACT, at §63.1207(d)(3), states that "you must complete the performance testing within 60 days after the date of commencement..." The subsequent CPT of the three incinerators at Veolia's Sauget facility began by the date required by EPA Region 5, and was completed within 60 days.

4.1 Test Protocol Summary

A definition of the applicable emission limits and the resulting operating parameter limits (OPLs) are given in Section 4.0 of the CPT plans for each incinerator. The subsequent CPT of each of the incinerators included one test condition, and the test condition included one mode of operation. One set of OPLs was developed for each incinerator.

In the first part of the test for each incinerator, Veolia demonstrated compliance with the particulate matter standard of the HWC MACT while the plant was operated to establish the maximum ash feedrate and maximum combustion gas flowrate OPLs as required by the HWC MACT for the particulate matter standard. Compliance with the standard for carbon monoxide was also demonstrated during this portion of the test.

In the second part of the test for each incinerator, Veolia demonstrated compliance, and developed OPLs, with the HCl/Cl_2, dioxins/furans, THC, CO, LVM, SVM, and mercury standards of the HWC MACT while the plant was operated to establish maximum total hazardous waste feedrate, maximum pumpable hazardous waste feedrate, minimum primary combustion chamber (PCC) temperature, minimum secondary combustion chamber (SCC) temperature, maximum LVM, SVM, and Hg feedrates, maximum chlorine feedrate, maximum combustion gas flowrate, and maximum inlet temperature to the baghouse. Ash was fed to the incinerators at normal (or higher) levels during this portion of the test. Compliance with the standard for carbon monoxide was demonstrated during all testing.

Samples of the wastes fed during the tests were sampled every 15 minutes and composited for analysis. Waste feed samples were collected in coordination with the PM, HCl/Cl_2, metals, and dioxins/furans stack testing. Composite liquid waste feed samples associated with each of the four sampling trains were analyzed for ash, total chlorine, heat content, moisture, density, and viscosity. The composite liquid waste feed samples collected during the Method 29 stack sampling from the second part of the test were also analyzed for metals (arsenic, beryllium, chromium, cadmium, lead, and mercury). All of the composite solid waste feed samples, containerized and bulk, from the first and second parts of the test were analyzed for total chlorine, ash, moisture, and heat content. The composite containerized waste feed samples for Units 2, 3, and 4, and bulk solid waste feed samples from Unit 4, collected during the Method 29 stack sampling from the second part of the test were also analyzed for metals (arsenic, beryllium, chromium, cadmium, lead, and mercury).

Chlorine and the metals lead, chromium and mercury were spiked into each of the three incinerators during, and throughout, the second part of each test run.

Per 40 CFR §63.1206(b)(7)(i)(A) compliance with the DRE standard is required to be demonstrated only one time and Veolia demonstrated DRE for each of the three incinerators in RCRA trial burns. The RCRA trial burn for Unit 2 was conducted in January 1993, and the RCRA trial burn for Unit 3 was conducted in November 1996. The RCRA trial burn for Unit 4 was conducted in December 1995. Veolia did not re-demonstrate DRE in the subsequent CPT for the Final Replacement Standards of the HWC MACT because DRE, and the associated OPLs, were demonstrated during the RCRA trial burns, and operation of the incinerators has not significantly changed since those tests. The operating limits demonstrated with the standard for DRE in the RCRA Trial Burns of Units 2, 3, and 4 were considered in the development of OPLs for the incinerators.

The OPLs associated with each of the applicable emission standards demonstrated during the subsequent CPT (i.e., PM, HCl/Cl_2 gas, metals, and dioxins/furans) were developed using process data taken during the collection of the applicable sampling train (i.e., EPA Method 5 for particulate matter, Modified EPA Method 26A for HCl/Cl_2, EPA Method 29 for metals, and SW-846 Method 0023A for dioxins/furans). Operating parameter data were used as shown in Table 4-1 to develop HWC MACT OPLs.

Table 4-1. Data Used to Establish OPLs

Demonstrated OPLs	Emission Standard	OPLs Developed During the CPT		
		Unit 2	Unit 3	Unit 4
Maximum Pumpable Waste Feedrate	DRE	1993	1996	1995
	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
Maximum Total Waste Feedrate	DRE	1993	1996	1995
	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
Maximum Stack Gas Flowrate	SVM	✓	✓	✓
	LVM	✓	✓	✓
	PM	✓	✓	✓
	HCl/Cl_2	✓	✓	✓
	DRE	1993	1996	1995
	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
Minimum Combustion Chamber Temperature in the PCC	DRE	1993	1996	1995
	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
Minimum Combustion Chamber Temperature in the SCC	DRE	1993	1996	1995
	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
Maximum Total Feedrate of LVM (As, Be, Cr)	LVM	✓	✓	✓
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	LVM	✓	✓	✓
Maximum Feedrate of SVM (Pb, Cd)	SVM	✓	✓	✓
Maximum Feedrate of Mercury (Hg)	Hg	✓	✓	✓
Maximum Feedrate of Ash	PM	✓	✓	✓
Maximum Feedrate of Total Chlorine/Chloride	HCl/Cl_2	✓	✓	✓
	LVM	✓	✓	✓
	SVM	✓	✓	✓
Maximum Baghouse Inlet Temperature	THC	✓	✓	✓
	Dioxins/Furans	✓	✓	✓
	LVM	✓	✓	✓
	SVM	✓	✓	✓
Minimum Carbon Feedrate	Dioxins/Furans	NA	NA	✓
	Hg	NA	NA	✓
Minimum Sorbent Feedrate	HCl/Cl_2	✓	✓	✓
Minimum Carrier Fluid Flowrate	HCl/Cl_2	✓	✓	✓

1993 – Operating data from the January 1993 RCRA Trial Burn for Unit 2.

1996 – Operating data from the November 1996 RCRA Trial Burn for Unit 3.

1995 – Operating data from the December 1995 RCRA Trial Burn for Unit 4.

4.2 Summary of Results

Veolia successfully demonstrated compliance with all of the applicable regulatory requirements of the HWC MACT for Unit 2, Unit 3, and Unit 4 using the results from the single test condition of each unit. Table 4-2 summarizes the results of the emissions testing of Unit 2. Table 4-3 summarizes the results of the emissions testing of Unit 3, and Table 4-4 summarizes the results of the emissions testing of Unit 4. The test for each unit consisted of three reported runs for each parameter of interest. All reported results of the CPT are reported in the CPT Report.

The term "test condition" refers to the sum of all the testing activities designed to demonstrate the operation of the waste incinerator under particular operating parameters (e.g., development of operating parameter limits) under the HWC MACT. The term "test run" refers to the replicate testing periods. A complete definition of the test protocol and methodology is defined in the CPT Plan and QAPjP.

Table 4-2. Unit 2 Compliance Summary

Parameter	HWC MACT Limit	Unit 2				
		Run 1 10-8-13	Run 2 10-9-13	Run 3 10-10-13	Run 5 10-30-13	Average
Particulate Matter – EPA Method 5	0.013 gr/dscf corrected to 7% O_2	<0.00087	<0.00068	<0.00058		<0.00071
HCl/Cl_2 – Modified EPA Method 26A	32 ppmv dry, as Cl^-, corrected to 7% O_2	<29		<13	<18	<20
Metals – EPA Method 29						
LVM	92 µg/dscm corrected to 7% O_2	<2.8		<2.4	<2.5	<2.6
SVM	230 µg/dscm corrected to 7% O_2	<1.1		<0.78	<1.0	<0.95
Mercury	130 µg/dscm corrected to 7% O_2	<90		<120	<95	<100
Dioxins/Furans – SW-846 Method 0023A	0.20 ng/dscm corrected to 7% O_2	0.00543		0.00624	0.0157	0.00912
Total Hydrocarbons (THC)[1] – EPA Method 25A	10 ppmv, dry corrected to 7% O_2	1.6		0.18	0.49	0.75
Carbon Monoxide (CO)[1]	100 ppmv, dry corrected to 7% O_2	0.00		0.00	0.15	0.05

[1] THC and CO results collected during the stack sampling for dioxins/furans.

Table 4-3. Unit 3 Compliance Summary

Parameter	HWC MACT Limit	Unit 3				
		Run 1 10-15-13	Run 2 10-16-13	Run 3 10-17-13	Run 4 10-18-13	Average
Particulate Matter – EPA Method 5	0.013 gr/dscf corrected to 7% O_2	0.00194	0.00202	0.00204		0.00200
HCl/Cl_2 – Modified EPA Method 26A	32 ppmv dry, as Cl^-, corrected to 7% O_2		<4.5	<4.4	<1.8	<3.6
Metals – EPA Method 29						
LVM	92 µg/dscm corrected to 7% O_2		<8.6	<8.9	<11	<9.4
SVM	230 µg/dscm corrected to 7% O_2		<20	<14	<12	<15
Mercury	130 µg/dscm corrected to 7% O_2		<59	<39	<46	<48
Dioxins/Furans – SW-846 Method 0023A	0.20 ng/dscm corrected to 7% O_2		0.00103	0.00115	0.00134	0.00118
Total Hydrocarbons (THC)[1] – EPA Method 25A	10 ppmv, dry corrected to 7% O_2		0.44	0.26	0.57	0.43
Carbon Monoxide (CO)[1]	100 ppmv, dry corrected to 7% O_2		0.00	0.00	0.00	0.00

[1] THC and CO results collected during the stack sampling for dioxins/furans.

Table 4-4. Unit 4 Compliance Summary

Parameter	HWC MACT Limit	Unit 4				
		Run 1 10-23-13	Run 2 10-24-13	Run 3 10-25-13	Run 4 10-25-13	Average
Particulate Matter – EPA Method 5	0.013 gr/dscf corrected to 7% O_2	0.00269		0.00183	<0.0019	<0.0021
HCl/Cl_2 – Modified EPA Method 26A	32 ppmv dry, as Cl^-, corrected to 7% O_2	<11	<8.0	<23		<14
Metals – EPA Method 29						
LVM	92 µg/dscm corrected to 7% O_2	<12	<9.8	<7.5		<9.7
SVM	230 µg/dscm corrected to 7% O_2	<8.6	<4.5	<10		<7.8
Mercury	130 µg/dscm corrected to 7% O_2	<7.1	<8.1	<15		<10
Dioxins/Furans – SW-846 Method 0023A	0.40 ng/dscm corrected to 7% O_2	0.138	0.132	0.139		0.137
Total Hydrocarbons (THC)[1] – EPA Method 25A	10 ppmv, dry corrected to 7% O_2	0.51	0.60	0.85		0.65
Carbon Monoxide (CO)[1]	100 ppmv, dry corrected to 7% O_2	0.07	0.06	0.08		0.07

[1] THC and CO results collected during the stack sampling for dioxins/furans.

5.0 Operating Parameter Limits

Table 5-1 and 5-2 present the operating parameter limits (OPLs) established for the three incinerators (i.e., Unit 2, Unit 3, and Unit 4) at the Veolia facility in Sauget, Illinois in compliance with the Final Replacement Standards of the HWC MACT. Unit 2 and Unit 3 are both Fixed Hearth Dual Chambered Incinerators. The two fixed hearth units are identical except that Unit 2 is equipped with four (4) baghouse modules, while Unit 3 is equipped with three (3) baghouse modules. However, each incinerator is operated identically with only three baghouse modules in service during operation. Unit 3 is a mirror image of Unit 2. Because Unit 2 and Unit 3 are identical and are operated the same way, one set of OPLs for Unit 2 and Unit 3 are established for both units. The OPLs for Units 2 and 3 are established selecting the more conservative, or stringent, value developed for Unit 2 or Unit 3. Table 5-1 presents the OPLs established for Unit 2 and Unit 3. Table 5-2 presents the OPLs established for Unit 4.

OPLs to comply with the Final Replacement Standards were developed based on data collected during the October 2013 CPT, and data for DRE from RCRA Trial Burns conducted in 1993 for Unit 2, 1996 for Unit 3, and 1995 for Unit 4. Also note that OPLs were developed, as appropriate, during the EPA Method 5 testing for PM, Modified EPA Method 26A for HCl/Cl_2, EPA Method 29 for metals, and SW-846 Method 0023A for dioxins/furans of the 2013 CPT for each of Unit 2, Unit, 3 and Unit 4. In those cases where an OPL is applicable to more than one standard, the OPL was established selecting the more, or most, stringent value (i.e., the lower, or lowest, value where the OPL is a maximum, and a higher, or highest, value where the OPL is a minimum) from these tests. Tables 5-1 and 5-2 present the source of the OPL.

Tables 5-3 and 5-4 present the bases for development of the OPLs shown in Tables 5-1 and 5-2. The data used to develop the OPLs are presented in Table 5-3 for Unit 2, Table 5-3 for Unit 3, and Table 5-4 for Unit 4 for each of the Final Replacement Standards of the HWC MACT.

The CPT Plan, that included test plans for Unit 2, Unit 3, and Unit 4, presented an approach to extrapolate the feedrates of SVM, total and pumpable LVM, and mercury based on the SREs (System Removal Efficiencies) of lead, chromium, and mercury measured during the CPT. The OPLs for the feedrates of SVM, total and pumpable LVM, or mercury presented in this NOC do not include extrapolation of the feedrates of SVM, total and pumpable LVM, and mercury demonstrated, and measured, during the CPT. As presented in the CPT Plan, Veolia will have further discussions with EPA Region 5 before extrapolation is requested. Since extrapolation of metals feedrates is not being requested by this NOC, SREs for lead, chromium, and mercury are not in the CPT Report.

Table 5-1. HWC MACT Operating Parameter Limits for the Final Replacement Standards for Units 2 and 3

Operating Parameter	Permitting Units	OPL Established From	Operating Limit
Maximum Feedrate of Total Mercury	12-HRA	2013 CPT Unit 2 Metals Test	0.0021 lb/hr
Maximum Total Feedrate of SVM (Pb, Cd)	12-HRA	2013 CPT Unit 2 Metals Test	62 lb/hr
Maximum Total Feedrate of LVM (As, Be, Cr)	12-HRA	2013 CPT Unit 3 Metals Test	46 lb/hr
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	12-HRA	2013 CPT Unit 3 Metals Test	46 lb/hr
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	2013 CPT Unit 3 Metals Test	204 lb/hr
Maximum Feedrate of Ash	12-HRA	2013 CPT Unit 2 PM Test	503 lb/hr
Minimum Combustion Chamber Temperature in the PCC	HRA	2013 CPT Unit 3 Dioxins/Furans Test	1,709°F
Minimum Combustion Chamber Temperature in the SCC	HRA	2013 CPT Unit 3 Dioxins/Furans Test	1,885°F
Maximum Flue Gas Flowrate	HRA	2013 CPT Unit 3 PM Test	15,310 acfm
Maximum Total Hazardous Waste Feedrate	HRA	1993 RCRA Trial Burn Unit 2	4,017 lb/hr
Maximum Pumpable Hazardous Waste Feedrate	HRA	1993 RCRA Trial Burn Unit 2	3,107 lb/hr
Maximum Baghouse Inlet Temperature [1]	HRA	2013 CPT Unit 2 and 3 Dioxins/Furans and Metals Tests	420°F
Minimum Sorbent Feedrate	HRA	2013 CPT Unit 2 HCl/Cl_2 Test	2.24 lb/lb Cl2
Minimum Carrier Fluid Flowrate	HRA	2013 CPT Unit 2 HCl/Cl_2 Test	1.90 gal/lb Cl2
Emission Limit for Carbon Monoxide	HRA		100 ppmv corrected to 7% O_2

HRA – Hourly Rolling Average

12-HRA – 12-Hour Rolling Average

[1] Measured as the SDA (Spray Dryer/Absorber) Outlet Temperature.

Table 5-2. HWC MACT Operating Parameter Limits for the Final Replacement Standards for Unit 4

Operating Parameter	Permitting Units	OPL Established From	Operating Limit
Maximum Feedrate of Total Mercury	12-HRA	2013 CPT Metals Test	0.040 lb/hr
Maximum Total Feedrate of SVM (Pb, Cd)	12-HRA	2013 CPT Metals Test	62 lb/hr
Maximum Total Feedrate of LVM (As, Be, Cr)	12-HRA	2013 CPT Metals Test	46 lb/hr
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	12-HRA	2013 CPT Metals Test	46 lb/hr
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	2013 CPT HCl/Cl_2 Test	203 lb/hr
Maximum Feedrate of Ash	12-HRA	2013 CPT PM Test	4,777 lb/hr
Minimum Combustion Chamber Temperature in the PCC	HRA	2013 CPT Dioxins/Furans Test	1,561°F
Minimum Combustion Chamber Temperature in the SCC	HRA	2013 CPT Dioxins/Furans Test	1,881°F
Maximum Flue Gas Flowrate	HRA	2013 CPT HCl/Cl_2 Test	37,393 acfm
Maximum Total Hazardous Waste Feedrate to the PCC	HRA	2013 CPT Dioxins/Furans Test	10,632 lb/hr
Maximum Pumpable Hazardous Waste Feedrate to the PCC	HRA	1995 RCRA Trial Burn	3,312 lb/hr
Maximum Total (Pumpable) Hazardous Waste Feedrate to the SCC	HRA	2013 CPT Dioxins/Furans Test	1,203 lb/hr
Maximum Baghouse Inlet Temperature [1]	HRA	2013 CPT Dioxins/Furans and Metals Tests	399°F
Minimum Carbon Injection Feedrate	HRA	2013 CPT Dioxins/Furans and Metals Tests	6.2 lb/hr
Minimum Sorbent Feedrate	HRA	2013 CPT HCl/Cl_2 Test	2.13 lb/lb Cl2
Minimum Carrier Fluid Flowrate	HRA	2013 CPT HCl/Cl_2 Test	3.10 gal/lb Cl2
Emission Limit for Carbon Monoxide	HRA		100 ppmv corrected to 7% O_2

HRA – Hourly Rolling Average

12-HRA – 12-Hour Rolling Average

[1] Measured as the SDA (Spray Dryer/Absorber) Outlet Temperature.

Table 5-3. Unit 2 Development of HWC MACT Operating Limits

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1993 RCRA Trial Burn	2013 CPT
Destruction and Removal Efficiency			**99.99%**	**>99.99970%** [1]	
Minimum Combustion Chamber Temperature in the Primary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,658°F	
Minimum Combustion Chamber Temperature in the Secondary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,848°F	
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(2)(ii)]		15,605 acfm	
Maximum Total Hazardous Waste Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		4,017 lb/hr	
Maximum Pumpable Hazardous Waste Feed	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		3,107 lb/hr	
Dioxins/Furans [2]			**0.20 ng/dscm TEQs corrected to 7% O_2**		**0.00912**
Minimum Combustion Chamber Temperature in the Primary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,703°F
Minimum Combustion Chamber Temperature in the Secondary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,881°F
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(3)(i)]			15,697 acfm
Maximum Total Hazardous Waste Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			4,430 lb/hr
Maximum Pumpable Hazardous Waste Feed	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			3,518 lb/hr
Maximum Baghouse Inlet Temperature [3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(1)(i)]			420°F

Table 5-3. Unit 2 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1993 RCRA Trial Burn	2013 CPT
Mercury [2]			**130 μg/dscm corrected to 7% O_2**		**<100**
Maximum Feedrate of Total Mercury	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(l)(1)]			0.00212 lb/hr
Particulate Matter [2]			**0.013 grains/dscf corrected to 7% O_2**		**<0.00071**
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(m)(2)(i)]			15,412 acfm
Maximum Feedrate of Ash	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(m)(3)]			503.0 lb/hr
Semivolatile Metals - SVM (Pb, Cd) [2]			**230 μg/dscm corrected to 7% O_2**		**<0.95**
Low Volatile Metals - LVM (As, Be, Cr) [2]			**92 μg/dscm corrected to 7% O_2**		**<2.6**
Maximum Total Feedrate of SVM (Pb, Cd)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(A)]			61.9 lb/hr
Maximum Total Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(B)]			46.3 lb/hr
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(C)]			46.3 lb/hr
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(5)(i)]			15,697 acfm
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(4)]			206.1 lb/hr
Maximum Baghouse Inlet Temperature [3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(1)]			420°F

Table 5-3. Unit 2 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1993 RCRA Trial Burn	2013 CPT
Hydrochloric Acid and Chlorine Gas (HCl/Cl_2) [2]			**32 ppmv combined as Cl^- equivalents, corrected to 7% O_2**		**<0.20**
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(1)]			206.1 lb/hr
Maximum Flue Gas Flow	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(o)(2)(i)]			15,557 acfm
Minimum Sorbent Feedrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(i)]			2.24 Lb/lb Cl2
Minimum Carrier Fluid Flowrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(ii)]			1.90 Gal/lb Cl2
Total Hydrocarbons (THC) [4]			**10 ppmv corrected to 7% O_2**		0.75 ppmv
Carbon Monoxide (CO) [4]			**100 ppmv corrected to 7% O_2**		0.05 ppmv

[1] Lowest value measured, for carbon tetrachloride and monochlorobenzene. All DREs determined to be >99.99%. DRE measured for the semivolatile POHC trichlorobenzene, and the volatile POHCs carbon tetrachloride and monochlorobenzene. Trichlorobenzene and monochlorobenzene are in Class 1 of the Thermal Stability Index; carbon tetrachloride is in Class 4.

[2] Average value.

[3] Measured as the SDA (Spray Dryer/Absorber) Outlet Temperature.

[4] Average value second half of test.

Table 5-4. Unit 3 Development of HWC MACT Operating Limits

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1996 RCRA Trial Burn	2013 CPT
Destruction and Removal Efficiency			**99.99%**	**>99.99983%** [1]	
Minimum Combustion Chamber Temperature in the Primary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,627°F	
Minimum Combustion Chamber Temperature in the Secondary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,845°F	
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(2)(ii)]		16,061 acfm	
Maximum Total Hazardous Waste Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		5,098 lb/hr	
Maximum Pumpable Hazardous Waste Feed	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		4,045 lb/hr	
Dioxins/Furans [2]			**0.20 ng/dscm TEQs corrected to 7% O_2**		**0.00118**
Minimum Combustion Chamber Temperature in the Primary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,709°F
Minimum Combustion Chamber Temperature in the Secondary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,885°F
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(3)(i)]			15,417 acfm
Maximum Total Hazardous Waste Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			4,410 lb/hr
Maximum Pumpable Hazardous Waste Feed	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			3,527 lb/hr
Maximum Baghouse Inlet Temperature [3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(1)(i)]			420°F

Table 5-4. Unit 3 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1996 RCRA Trial Burn	2013 CPT
Mercury [2]			**130 µg/dscm corrected to 7% O_2**		**<48**
Maximum Feedrate of Total Mercury	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(l)(1)]			0.00220 lb/hr
Particulate Matter [2]			**0.013 grains/dscf corrected to 7% O_2**		**0.00200**
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(m)(2)(i)]			15,310 acfm
Maximum Feedrate of Ash	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(m)(3)]			525.8 lb/hr
Semivolatile Metals - SVM (Pb, Cd) [2]			**230 µg/dscm corrected to 7% O_2**		**<15**
Low Volatile Metals - LVM (As, Be, Cr) [2]			**92 µg/dscm corrected to 7% O_2**		**<9.4**
Maximum Total Feedrate of SVM (Pb, Cd)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(A)]			62.3 lb/hr
Maximum Total Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(B)]			46.1 lb/hr
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(C)]			46.0 lb/hr
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(5)(i)]			15,417 acfm
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(4)]			204.2 lb/hr
Maximum Baghouse Inlet Temperature [3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(1)]			420°F

Table 5-4. Unit 3 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1996 RCRA Trial Burn	2013 CPT
Hydrochloric Acid and Chlorine Gas (HCl/Cl_2)[2]			**32 ppmv combined as Cl^- equivalents, corrected to 7% O_2**		**<3.6**
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(1)]			204.7 lb/hr
Maximum Flue Gas Flow	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(o)(2)(i)]			15,378 acfm
Minimum Sorbent Feedrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(i)]			2.09 Lb/lb Cl2
Minimum Carrier Fluid Flowrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(ii)]			1.84 Gal/lb Cl2
Total Hydrocarbons (THC)[3]			**10 ppmv corrected to 7% O_2**		0.43 ppmv
Carbon Monoxide (CO)[3]			**100 ppmv corrected to 7% O_2**		0.00 ppmv

[1] Lowest value measured, for 1,2,3-trichlorobenzene. All DREs determined to be >99.99%. DRE measured for the semivolatile POHC 1,2,3-trichlorobenzene, and the volatile POHCs carbon tetrachloride and tetrachloroethene. 1,2,3-Trichlorobenzene is not listed in the Thermal Stability Index, although 1,2,4 –trichlorobenzene and 1,3,5-trichlorobenzene are listed in Class 1. Tetrachloroethene is in Class 2 of the Thermal Stability Index; carbon tetrachloride is in Class 4.

[2] Average value.

[3] Measured as the SDA (Spray Dryer/Absorber) Outlet Temperature.

[4] Average value second half of test.

Table 5-5. Unit 4 Development of HWC MACT Operating Limits

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1995 RCRA Trial Burn	2013 CPT
Destruction and Removal Efficiency			**99.99%**	**>99.99981%** [1]	
Minimum Combustion Chamber Temperature in the Primary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,415°F	
Minimum Combustion Chamber Temperature in the Secondary Combustion Chamber	HRA	Average of the Test Run Averages [40 CFR 63.1209(j)(1)(ii)]		1,798°F	
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(2)(I)]		44,900 acfm	
Maximum Total Hazardous Waste Feedrate to the Primary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		18,667 lb/hr	
Maximum Pumpable Hazardous Waste Feedrate to the Primary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		3,312 lb/hr	
Maximum Total (Pumpable) Hazardous Waste Feed to the Secondary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(j)(3)(ii)]		1,788 lb/hr	

Table 5-5. Unit 4 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1995 RCRA Trial Burn	2013 CPT
Dioxins/Furans [2]			**0.40 ng/dscm TEQs corrected to 7% O_2**		**0.137**
Minimum Combustion Chamber Temperature in the Kiln	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,561°F
Minimum Combustion Chamber Temperature in the SCC	HRA	Average of the Test Run Averages [40 CFR 63.1209(k)(2)(ii)]			1,881°F
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(3)(i)]			37,869 acfm
Maximum Total Hazardous Waste Feedrate to the Primary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			10,632 lb/hr
Maximum Pumpable Hazardous Waste Feedrate to the Primary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			3,468 lb/hr
Maximum Total (Pumpable) Hazardous Waste Feed to the Secondary Combustion Chamber	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(4)(ii)]			1,203 lb/hr
Maximum Baghouse Inlet Temperature[3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(1)(i)]			399°F
Minimum Carbon Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(k)(6)(i)]			6.2 lb/hr
Mercury [2]			**130 µg/dscm corrected to 7% O_2**		**<10**
Maximum Feedrate of Total Mercury	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(l)(1)]			0.0401 lb/hr
Minimum Carbon Feedrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(l)(3)]			6.2 lb/hr

Table 5-5. Unit 4 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1995 RCRA Trial Burn	2013 CPT
Particulate Matter [2]			**0.013 grains/dscf corrected to 7% O_2**		**<0.0021**
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(m)(2)(i)]			37,800 acfm
Maximum Feedrate of Ash	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(m)(3)]			4,777 lb/hr
Semivolatile Metals - SVM (Pb, Cd) [2]			**230 µg/dscm corrected to 7% O_2**		**<7.8**
Low Volatile Metals - LVM (As, Be, Cr) [2]			**92 µg/dscm corrected to 7% O_2**		**<9.7**
Maximum Total Feedrate of SVM (Pb, Cd)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(A)]			62.0 lb/hr
Maximum Total Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(B)]			46.2 lb/hr
Maximum Pumpable Feedrate of LVM (As, Be, Cr)	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(2)(i)(C)]			45.9 lb/hr
Maximum Flue Gas Flowrate	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(5)(i)]			37,869 acfm
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(n)(4)]			205.0 lb/hr
Maximum Baghouse Inlet Temperature[3]	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(n)(1)]			399°F

Table 5-5. Unit 4 Development of HWC MACT Operating Limits (continued)

Operating Parameter	Averaging Period	Regulatory Basis	HWC MACT Limit	Measured Values	
				1995 RCRA Trial Burn	2013 CPT
Hydrochloric Acid and Chlorine Gas (HCl/Cl_2) [2]			**32 ppmv combined as Cl^- equivalents, corrected to 7% O_2**		<14
Maximum Feedrate of Total Chlorine/Chloride	12-HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(1)]			203.2 lb/hr
Maximum Flue Gas Flow	HRA	Average of the Test Run Maximum HRAs [40 CFR 63.1209(o)(2)(i)]			37,393 acfm
Minimum Sorbent Feedrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(i)]			2.13 Lb/lb Cl2
Minimum Carrier Fluid Flowrate	HRA	Average of the Test Run Averages [40 CFR 63.1209(o)(4)(ii)]			3.10 Gal/lb Cl2
Total Hydrocarbons (THC) [4]			**10 ppmv corrected to 7% O_2**		0.65 ppmv
Carbon Monoxide (CO) [4]			**100 ppmv corrected to 7% O_2**		0.07 ppmv

[1] Lowest value measured, for hexachloroethane. Lowest DRE measured for monochlorobenzene was >99.99983%. All DREs determined to be >99.99%. DRE measured for the semivolatile POHCs naphthalene and hexachloroethane, and the volatile POHC monochlorobenzene. Naphthalene and monochlorobenzene are listed in Class 1 of the Thermal Stability Index. Hexachloroethane is listed in Class 5 of the Thermal Stability Index Index.

[2] Average value.

[3] Measured as the SDA (Spray Dryer/Absorber) Outlet Temperature.

[4] Average value second half of test.

6.0 Bases for Establishment of OPLs

The HWC MACT has standards for eight emission limits and for destruction and removal efficiency (DRE). In association with each of these standards, the HWC MACT requires that feedrate limits and/or operating parameter limits (OPLs) be established for the combustion systems and/or for air pollution control equipment. The operation of the unit within the feedrate limits and OPLs will ensure that the standards of the HWC MACT are being continuously achieved. Listed below are the HWC MACT limits and the feedrate and OPLs required for each standard. For each feedrate limit or OPL, an explanation is provided for the establishment of the feedrate limit or OPL. As stated in 40 CFR 63.1209(i), if an operating parameter is applicable to multiple standards then the most stringent limit applies.

- **DRE – 40 CFR 63.1209(j)**

  Compliance with the standard for destruction and removal efficiency (DRE) was demonstrated using data from RCRA Trial Burns conducted in 1993 for Unit 2, 1996 for Unit 3, and 1995 for Unit 4. Applicable feedrates and OPLs associated with this standard are established using data from these trial burns.

Units 2 and 3

Minimum Combustion Chamber Temperature in the PCC - 40 CFR 63.1209(j)(1)

Minimum combustion chamber temperature in the PCC was developed during the 1993 RCRA Trial Burn for Unit 2, 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3. The OPL for minimum combustion chamber temperature in the PCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 3.

Minimum Combustion Chamber Temperature in the SCC - 40 CFR 63.1209(j)(1)

Minimum combustion chamber temperature in the SCC was developed during the 1993 RCRA Trial Burn for Unit 2, the 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3. The OPL for minimum combustion chamber temperature in the SCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 3.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(j)(2)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1993 RCRA Trial Burn for Unit 2 and the 1996 RCRA Trial Burn for Unit 3. During the 2013 CPT for Units 2 and 3, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the PM testing of the 2013 CPT of Unit 3.

Maximum Total Hazardous Waste Feedrate to the PCC - 40 CFR 63.1209(j)(3)

Units 2 and 3 feed both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum total hazardous waste feedrate to the PCC is based on the combined measured nonpumpable and pumpable waste feedrates to the PCC during the 1993 RCRA Trial Burn for Unit 2, 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3.

The OPL for maximum hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the 1993 RCRA Trial Burn of Unit 2.

Maximum Pumpable Hazardous Waste Feedrate to the PCC - 40 CFR 63.1209(j)(3)
Units 2 and 3 feed both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum pumpable hazardous waste feedrate to the PCC is based on the pumpable waste feedrate to the PCC during the 1993 RCRA Trial Burn for Unit 2, 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3. The OPL for maximum pumpable hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the 1993 RCRA Trial Burn of Unit 2.

Unit 4

Minimum Combustion Chamber Temperature in the PCC (Kiln) - 40 CFR 63.1209(j)(1)
Minimum combustion chamber temperature in the PCC was developed during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for minimum combustion chamber temperature in the PCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 4.

Minimum Combustion Chamber Temperature in the SCC - 40 CFR 63.1209(j)(1)
Minimum combustion chamber temperature in the SCC was developed during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for minimum combustion chamber temperature in the SCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 4.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(j)(2)
Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1995 RCRA Trial Burn. During the 2013 CPT for Unit 4, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Maximum Total Hazardous Waste Feedrate to the PCC (Kiln) - 40 CFR 63.1209(j)(3)
Unit 4 feeds both pumpable and nonpumpable hazardous wastes to the PCC (Kiln). The OPL for maximum total hazardous waste feedrate to the PCC is based on the combined measured nonpumpable and pumpable waste feedrates to the PCC during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for maximum total hazardous waste feedrate to the PCC was established during the dioxins/furans testing of the 2013 CPT of Unit 4.

Maximum Pumpable Hazardous Waste Feedrate to the PCC (Kiln) - 40 CFR 63.1209(j)(3)
Unit 4 feeds both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum pumpable hazardous waste feedrate to the PCC is based on the nonpumpable and pumpable waste feedrate to the PCC during the during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for maximum pumpable hazardous waste feedrate to the PCC was established during the 1995 RCRA Trial Burn of Unit 4.

Maximum Total (Pumpable) Hazardous Waste Feedrate to the SCC - 40 CFR 63.1209(j)(3)
Unit 4 feeds pumpable hazardous wastes to the SCC. The OPL for maximum pumpable hazardous waste feedrate to the SCC is based on the pumpable waste feedrate to the SCC during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for maximum pumpable hazardous waste feedrate to the SCC was established during the dioxins/furans testing of the 2013 CPT of Unit 4.

- **Dioxins and Furans – 40 CFR 63.1209(k)**

  Compliance with the standard for dioxins and furans was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are established from the 2013 CPT.

  Units 2 and 3

  Gas Temperature at the Inlet to a Dry Particulate Matter Control Device – 40 CFR 63.1209(k)(1)
  The dry particulate matter control devices on Units 2 and 3 are baghouses. The temperature to the inlet of the baghouse is measured as the SDA (Spray Dryer/Absorber) Outlet Temperature, and was developed during the 2013 CPT for Units 2 and 3 in association with the standards for Dioxins/Furans and Metals. The OPL for maximum baghouse inlet temperature was established during the dioxins/furans and metals testing of the 2013 CPT of Units 2 and 3.

  Minimum Combustion Chamber Temperature in the PCC - 40 CFR 63.1209(k)(2)
  Minimum combustion chamber temperature in the PCC was developed during the 2013 CPT for Unit 2 and the 2013 CPT of Unit 3 in association with the standard for Dioxins and Furans. The OPL for minimum combustion chamber temperature in the PCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 3.

  Minimum Combustion Chamber Temperature in the SCC - 40 CFR 63.1209(k)(2)
  Minimum combustion chamber temperature in the SCC was developed during the 2013 CPT for Unit 2 and the 2013 CPT of Unit 3 in association with the standard for Dioxins and Furans. The OPL for minimum combustion chamber temperature in the SCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 3.

  Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(k)(3)
  Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
  The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1993 RCRA Trial Burn for Unit 2 and the 1996 RCRA Trial Burn for Unit 3. During the 2013 CPT for Units 2 and 3, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the PM testing of the 2013 CPT of Unit 3.

  Maximum Total Hazardous Waste Feedrate to the PCC - 40 CFR 63.1209(k)(4)
  Units 2 and 3 feed both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum total hazardous waste feedrate to the PCC is based on the combined measured nonpumpable and pumpable waste feedrates to the PCC during the 1993 RCRA Trial Burn for Unit 2, 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3. The OPL for maximum hazardous waste feedrate to the PCC was developed in association with the standard for Dioxins and Furans during the 2013 CPT for Unit 2 and the 2013 CPT of Unit 3. The OPL for maximum hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the 1993 RCRA Trial Burn of Unit 2.

  Maximum Pumpable Hazardous Waste Feedrate to the PCC - 40 CFR 63.1209(k)(4)
  Units 2 and 3 feed both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum pumpable hazardous waste feedrate to the PCC is based on the pumpable waste feedrate to the PCC during the 1993 RCRA Trial Burn for Unit 2, 1996 RCRA Trial Burn for Unit 3, the 2013 CPT for Unit 2, and the 2013 CPT of Unit 3. The OPL for maximum pumpable waste feedrate to the PCC was developed in association with the standard for Dioxins and Furans during the 2013 CPT for Unit 2 and the 2013 CPT of Unit 3. The OPL for maximum pumpable hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the 1993 RCRA Trial Burn of Unit 2.

Particulate Matter Operating Limit - 40 CFR 63.1209(k)(5)
Not applicable. This OPL is only applicable if the incinerator is equipped with an activated carbon injection system. Carbon is not injected into Units 2 and 3.

Activated Carbon Injection Parameter Limits - 40 CFR 63.1209(k)(6)
Not applicable. There is no carbon injection system on Units 2 and 3.

Carbon Bed Parameter Limits - 40 CFR 63.1209(k)(7)
Not applicable. There is not a carbon bed on the incinerators at Sauget.

Catalytic Oxidizer Parameter Limits - 40 CFR 63.1209(k)(8)
Not applicable. There is not a catalytic oxidizer on the incinerators at Sauget.

Unit 4

Gas Temperature at the Inlet to a Dry Particulate Matter Control Device – 40 CFR 63.1209(k)(1)
The dry particulate matter control device on Unit 4 is a baghouse. The temperature to the inlet of the baghouse is measured as the SDA (Spray Dryer/Absorber) Outlet Temperature, and was developed during the 2013 CPT for Unit 4 in association with the standards for Dioxins/Furans and Metals. The OPL for maximum baghouse inlet temperature was established during the dioxins/furans and metals testing of the 2013 CPT of Unit 4.

Minimum Combustion Chamber Temperature in the PCC (Kiln) - 40 CFR 63.1209(k)(2)
Minimum combustion chamber temperature in the PCC – the kiln - was developed during the 2013 CPT for Unit 4 in association with the standard for Dioxins and Furans, and in the 1995 RCRA Trial Burn of Unit 4 for DRE. The OPL for minimum combustion chamber temperature in the PCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 4.

Minimum Combustion Chamber Temperature in the SCC - 40 CFR 63.1209(k)(2)
Minimum combustion chamber temperature in the SCC was developed during the 2013 CPT for Unit 4 in association with the standard for Dioxins and Furans, and in the 1995 RCRA Trial Burn of Unit 4 for DRE. The OPL for minimum combustion chamber temperature in the SCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 4.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(k)(3)
Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar. The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1995 RCRA Trial Burn for Unit 4. During the 2013 CPT for Unit 4, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Maximum Total Hazardous Waste Feedrate to the PCC (Kiln) - 40 CFR 63.1209(k)(4)
Unit 4 feeds both pumpable and nonpumpable hazardous wastes to the PCC. The OPL for maximum total hazardous waste feedrate to the PCC is based on the combined measured nonpumpable and pumpable waste feedrates to the PCC. The OPL for maximum hazardous waste feedrate to the PCC was developed in association with the standard for Dioxins and Furans during the 2013 CPT for Unit 4, and in the 1995 RCRA Trial Burn of Unit 4 for DRE. The OPL for maximum hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the dioxins/furans testing of the 2013 CPT of Unit 4.

Maximum Pumpable Hazardous Waste Feedrate to the PCC (Kiln) - 40 CFR 63.1209(k)(4)
Unit 4 feeds both pumpable and nonpumpable hazardous wastes to the PCC – the kiln. The OPL for maximum pumpable hazardous waste feedrate to the PCC is based on the pumpable waste

feedrate to the PCC during the 1995 RCRA Trial Burn for Unit 2 and the 2013 CPT for Unit 4. The OPL for maximum pumpable waste feedrate to the PCC was developed in association with the standard for Dioxins and Furans during the 2013 CPT for Unit 4 and the 1995 RCRA Trial Burn of Unit 4 for DRE. The OPL for maximum pumpable hazardous waste feedrate to the PCC was established from the most stringent value of these tests, during the 1995 RCRA Trial Burn of Unit 4.

Maximum Total (Pumpable) Hazardous Waste Feedrate to the SCC - 40 CFR 63.1209(j)(3)

Unit 4 feeds pumpable hazardous wastes to the SCC. The OPL for maximum pumpable hazardous waste feedrate to the SCC is based on the pumpable waste feedrate to the SCC during the 1995 RCRA Trial Burn and the 2013 CPT of Unit 4. The OPL for maximum pumpable hazardous waste feedrate to the SCC was established during the dioxins/furans testing of the 2013 CPT of Unit 4.

Particulate Matter Operating Limit - 40 CFR 63.1209(k)(5)

The particulate matter control device on Unit 4 is a baghouse, and there are no OPLs for baghouses required by the HWC MACT.

Activated Carbon Injection - 40 CFR 63.1209(k)(6)

Carbon is injected into the baghouse on Unit 4. The minimum carbon feedrate was developed in association with the standard for Dioxins and Furans and the standard for Mercury during the 2013 CPT for Unit 4. The OPL for minimum carbon feedrate was established during the dioxins/furans and metals testing of the 2013 CPT of Unit 4.

Carbon Bed Parameter Limits - 40 CFR 63.1209(k)(7)

Not applicable. There is not a carbon bed on the incinerators at Sauget.

Catalytic Oxidizer Parameter Limits - 40 CFR 63.1209(k)(8)

Not applicable. There is not a catalytic oxidizer on the incinerators at Sauget.

- **Total Hydrocarbons – 40 CFR 63.1209(a)(7)**

  Compliance with the total hydrocarbons standard was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are the same as for DRE and dioxins/furans.

- **Mercury – 40 CFR 63.1209(l)**

  Compliance with the standard for mercury was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are established from the 2013 CPT.

<u>Units 2 and 3</u>

Maximum Feedrate of Total Mercury – 40 CFR 63.1209(l)(1)

The maximum feedrate of mercury was developed during the 2013 CPT of Units 2 and 3. The total feedrate of Mercury includes the spiking rates and the contribution of mercury with the waste streams – both pumpable and nonpumpable, and was established during the metals testing of the 2013 CPT of Unit 2.

The feedrate for mercury has not been extrapolated.

Wet Scrubber - 40 CFR 63.1209(l)(2)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Pressure Drop Across a High Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(0)(3)(i)

Not applicable. There is not a high energy scrubber on the incinerators at Sauget.

Minimum Pressure Drop for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(ii)

Not applicable. There is not a low energy scrubber on the incinerators at Sauget.

Minimum Liquid Feed Pressure for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(iii)

Not applicable. There is not a high energy scrubber on the incinerators at Sauget.

Minimum Liquid to Gas Ratio - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(v)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Activated Carbon Injection - 40 CFR 63.1209(l)(3)

Not applicable. There is no carbon injection system on Units 2 and 3.

Activated Carbon Bed - 40 CFR 63.1209(l)(4)

Not applicable. There is not a carbon bed on the incinerators at Sauget.

Catalytic Oxidizer Parameter Limits - 40 CFR 63.1209(k)(8)

Not applicable. There is not a catalytic oxidizer on the incinerators at Sauget.

Unit 4

Maximum Feedrate of Total Mercury – 40 CFR 63.1209(l)(1)

The maximum feedrate of mercury was developed during the 2013 CPT of Unit 4. The total feedrate of Mercury includes the spiking rates and the contribution of mercury with the waste streams – both pumpable and nonpumpable, and was established during the metals testing of the 2013 CPT of Unit 4.

The feedrate for mercury has not been extrapolated.

Wet Scrubber - 40 CFR 63.1209(l)(2)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Pressure Drop Across a High Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(0)(3)(i)

Not applicable. There is not a high energy scrubber on the incinerators at Sauget.

Minimum Pressure Drop for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(ii)

Not applicable. There is not a low energy scrubber on the incinerators at Sauget.

Minimum Liquid Feed Pressure for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(iii)

Not applicable. There is not a low energy scrubber on the incinerators at Sauget.

Minimum Liquid to Gas Ratio - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(v)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Activated Carbon Injection - 40 CFR 63.1209(l)(3)

Carbon is injected into the baghouse on Unit 4. The OPL for minimum carbon feedrate was developed in association with the standard for Dioxins and Furans and the standard for Mercury during the 2013 CPT for Unit 4. The OPL for minimum carbon feedrate was established during the dioxins/furans and metals testing of the 2013 CPT of Unit 4.

Activated Carbon Bed - 40 CFR 63.1209(l)(4)
Not applicable. There is not a carbon bed on the incinerators at Sauget.

Catalytic Oxidizer Parameter Limits - 40 CFR 63.1209(k)(8)
Not applicable. There is not a catalytic oxidizer on the incinerators at Sauget.

- **Particulate Matter – 40 CFR 63.1209(m)**
  Compliance with the standard for particulate matter was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are established from the 2013 CPT.

Control Device Operating Parameter Limits – 40 CFR 63.1209(m)(1)
The HWC MACT prescribes OPLs for high energy scrubbers and wet scrubbers used to control particulate matter (and metals). There is no high energy scrubber or wet scrubbers on the incinerators at Sauget used for control of particulate matter. The control devices on the incinerators at Sauget that are designed and operated to control particulate matter (and metals) are baghouses, and the HWC MACT has no OPLs for baghouses.

Minimum Pressure Drop Across a High Energy Scrubber – 40 CFR 63.1209(m)(1)(i)(A)
Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Liquid to Gas Ratio or *Minimum Scrubber Flowrate and Maximum Flue Gas Flowrate for a High Energy Scrubber* – 40 CFR 63.1209(m)(1)(i)(C)
Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Blowdown Rate and *Minimum Scrubber Tank Volume or Level*– OR – *Maximum Conductivity of Scrubber Water* – 40 CFR 63.1209(m)(1)(B)(*1*)
Not applicable. There are no wet scrubbers on the incinerators at Sauget.

Minimum Tank Level – 40 CFR 63.1209(m)(1)(B)(ii)
Not applicable. There are no wet scrubbers on the incinerators at Sauget

Units 2 and 3

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(m)(2)
Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1993 RCRA Trial Burn for Unit 2 and the 1996 RCRA Trial Burn for Unit 3. During the 2013 CPT for Units 2 and 3, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the PM testing of the 2013 CPT of Unit 3.

Maximum Ash Feedrate – 40 CFR 63.1209(m)(3)
The maximum feedrate of ash was developed during the 2013 CPT of Units 2 and 3, and was established during the PM testing of the 2013 CPT of Unit 2.

Unit 4

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(m)(2)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1995 RCRA Trial Burn for Unit 4. During the 2013 CPT for Unit 4, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Maximum Ash Feedrate – 40 CFR 63.1209(m)(3)

The maximum feedrate of ash was developed during the 2013 CPT of Unit 4, and was established during the PM testing of the 2013 CPT of Unit 4.

- **Semivolatile Metals and Low Volatility Metals – 40 CRF 63.1209(n)**

Compliance with the standard for semivolatile metals (SVM) and low volatility metals (LVM) was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are established from the 2013 CPT.

Units 2 and 3

Maximum Inlet Temperature to Dry Particulate Matter Air Pollution Control Device – 40 CFR 63.1209(n)(1)

The dry particulate matter control devices on Units 2 and 3 are baghouses. The temperature to the inlet of the baghouse is measured as the SDA (Spray Dryer/Absorber) Outlet Temperature, and was developed during the 2013 CPT for Units 2 and 3 in association with the standards for Dioxins/Furans and Metals. The OPL for maximum baghouse inlet temperature was established during the dioxins/furans and metals testing of the 2013 CPT of Units 2 and 3.

Maximum Feedrate of Semivolatile and Low Volatile Metals - 40 CFR 63.1209(n)(2)

The feedrates of the semivolatile metals (SVMs) lead (Pb) and cadmium (Cd), and the low volatility metals (LVMs) arsenic (As), beryllium (Be), and chromium (Cr) were demonstrated during the 2013 CPT of Units 2 and 3. The total feedrates of the SVMs and LVMs include the spiking rates and the contribution of these metals with the waste streams – both pumpable and nonpumpable.

The OPL for maximum feedrate of Semivolatile Metals (SVM) was established during the metals testing of the 2013 CPT of Units 2 and 3.

The OPL for maximum total feedrate of Low Volatility Metals (LVM) was established during the metals testing of the 2013 CPT of Units 2 and 3.

The OPL for maximum feedrate of pumpable Low Volatility Metals (LVM) was established during the metals testing of the 2013 CPT of Units 2 and 3.

Feedrates for SVM, total LVM, or pumpable LVM have not been extrapolated.

Control Device Operating Parameter Limits - 40 CFR 63.1209(n)(3)

These OPLs are identical to the OPLs for the Particulate Matter standard. 40 CFR 63.1209(n)(3) references 40 CFR 63.1209(m)(1). The OPLs established for the SVM and LVM standards and the Particulate Matter standard are the same, and are established from results of the 2013 CPT.

Minimum Pressure Drop Across a High Energy Scrubber

Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Liquid to Gas Ratio or *Minimum Scrubber Flowrate and Maximum Flue Gas Flowrate for a High Energy Scrubber*

Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Blowdown Rate and *Minimum Scrubber Tank Volume or Level*– OR – *Maximum Conductivity of Scrubber Water*

Not applicable. There are no wet scrubbers on the incinerators at Sauget.

Minimum Tank Level – 40 CFR 63.1209(n)(3) and 40 CFR 63.1209(m)(1)(B)(ii)

Not applicable. There are no wet scrubbers on the incinerators at Sauget.

Maximum Total Chlorine and Chloride Feedrate - 40 CFR 63.1209(n)(4)

The HWC MACT prescribes the establishment of the feedrate of total chlorine and chloride in association with both the SVM and LVM and the HCl/Cl_2 standards. The emission limits for SVM, LVM (i.e., metals),, and HCl/Cl_2 were demonstrated in the 2013 CPT. The feedrate of total chlorine and chloride includes the spiking rate and the contribution of chlorine with the waste streams – both pumpable and nonpumpable. The OPL for the maximum feedrate of total chlorine and chloride was established from the most stringent value of these tests, during the metals testing of the 2013 CPT of Unit 3.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(n)(5)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1993 RCRA Trial Burn for Unit 2 and the 1996 RCRA Trial Burn for Unit 3. During the 2013 CPT for Units 2 and 3, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the PM testing of the 2013 CPT of Unit 3.

<u>Unit 4</u>

Maximum Inlet Temperature to Dry Particulate Matter Air Pollution Control Device – 40 CFR 63.1209(n)(1)

The dry particulate matter control device on Unit 4 is a baghouse. The temperature to the inlet of the baghouse is measured as the SDA (Spray Dryer/Absorber) Outlet Temperature, and was developed during the 2013 CPT for Unit 4 in association with the standards for Dioxins/Furans and Metals. The OPL for maximum baghouse inlet temperature was established during the dioxins/furans and metals testing of the 2013 CPT of Unit 4.

Maximum Feedrate of Semivolatile and Low Volatile Metals - 40 CFR 63.1209(n)(2)

The feedrates of the semivolatile metals (SVMs) lead (Pb) and cadmium (Cd), and the low volatility metals (LVMs) arsenic (As), beryllium (Be), and chromium (Cr) were demonstrated during the 2013 CPT of Unit 4. The total feedrates of the SVMs and LVMs include the spiking rates and the contribution of these metals with the waste streams – both pumpable and nonpumpable.

The OPL for maximum feedrate of Semivolatile Metals (SVM) was established during the metals testing of the 2013 CPT of Unit 4.

The OPL for maximum total feedrate of Low Volatility Metals (LVM) was established during the metals testing of the 2013 CPT of Unit 4.

The OPL for maximum feedrate of pumpable Low Volatility Metals (LVM) was established during the metals testing of the 2013 CPT of Unit 4.

Feedrates for SVM, total LVM, or pumpable LVM have not been extrapolated.

Control Device Operating Parameter Limits - 40 CFR 63.1209(n)(3)

These OPLs are identical to the OPLs for the Particulate Matter standard. 40 CFR 63.1209(n)(3) references 40 CFR 63.1209(m)(1). The OPLs established for the SVM and LVM standards and the Particulate Matter standard are the same, and are established from results of the 2011 CPT.

Minimum Pressure Drop Across a High Energy Scrubber

Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Liquid to Gas Ratio or *Minimum Scrubber Flowrate and Maximum Flue Gas Flowrate for a High Energy Scrubber*

Not applicable. There are no high energy scrubbers on the incinerators at Sauget.

Minimum Blowdown Rate and *Minimum Scrubber Tank Volume or Level*– OR – *Maximum Conductivity of Scrubber Water*

Not applicable. There are no wet scrubbers on the incinerators at Sauget.

Minimum Tank Level – 40 CFR 63.1209(n)(3) and 40 CFR 63.1209(m)(1)(B)(ii)

Not applicable. There are no wet scrubbers on the incinerators at Sauget.

Maximum Total Chlorine and Chloride Feedrate - 40 CFR 63.1209(n)(4)

The HWC MACT prescribes the establishment of the feedrate of total chlorine and chloride in association with both the SVM and LVM and the HCl/Cl_2 standards. The emission limits for SVM, LVM (i.e., metals),, and HCl/Cl_2 were demonstrated in the 2013 CPT. The feedrate of total chlorine and chloride includes the spiking rate and the contribution of chlorine with the waste streams – both pumpable and nonpumpable. The OPL for the maximum feedrate of total chlorine and chloride was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(n)(5)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1995 RCRA Trial Burn for Unit 4. During the 2013 CPT for Unit 4, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

- **Hydrochloric Acid and Chlorine Gas - 40 CFR 63.1209(o)**

Compliance with the standard for hydrochloric acid and chlorine gas (HCl/Cl_2) was demonstrated during the 2013 CPT. Applicable feedrates and OPLs associated with this standard are established from the 2013 CPT.

Units 2 and 3

Maximum Total Chlorine and Chloride Feedrate - 40 CFR 63.1209(o)(1)

The HWC MACT prescribes the establishment of the feedrate of total chlorine and chloride in association with both the SVM and LVM and the HCl/Cl_2 standards. The emission limits for SVM, LVM (i.e., metals),, and HCl/Cl_2 were demonstrated in the 2013 CPT. The feedrate of total chlorine and chloride includes the spiking rate and the contribution of chlorine with the waste streams – both pumpable and nonpumpable. The OPL for the maximum feedrate of total chlorine and chloride was established from the most stringent value of these tests, during the metals testing of the 2013 CPT of Unit 3.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(o)(2)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1993 RCRA Trial Burn for Unit 2 and the 1996 RCRA Trial Burn for Unit 3. During the 2013 CPT for Units 2 and 3, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the PM testing of the 2013 CPT of Unit 3.

Dry Scrubber - 40 CFR 63.1209(o)(4)

The control devices on the incinerators at Sauget that are designed and operated to control HCl and Cl_2 are Spray Dryer/Absorbers, considered as Dry Scrubbers. The HWC MACT prescribes the establishment of OPLs for dry scrubbers in association with the HCl/Cl_2 standard.

Minimum Sorbent Feedrate - 40 CFR 63.1209(o)(4)(i)

The HWC MACT prescribes the establishment of an OPL for sorbent feedrate to a dry scrubber. The OPL for the minimum feedrate of sorbent to the Spray Dryer/Absorber (SDA) is measured as the feedrate of lime to the SDA, and was developed during the 2013 CPT for Units 2 and 3 in association with the standard for HCl/Cl_2. The OPL for minimum sorbent feedrate to the SDA was established during the HCl/Cl_2 testing of the 2013 CPT of Unit 2.

Minimum Carrier Fluid Flowrate or Nozzle Pressure Drop - 40 CFR 63.1209(o)(4)(ii)

The HWC MACT prescribes the establishment of an OPL for carrier fluid flowrate to a dry scrubber. The OPL for the minimum carrier fluid flowrate to the Spray Dryer/Absorber (SDA) was developed during the 2013 CPT for Units 2 and 3 in association with the standard for HCl/Cl_2. The OPL for minimum sorbent feedrate to the SDA was established during the HCl/Cl_2 testing of the 2013 CPT of Unit 2.

Wet Scrubber - 40 CFR 63.1209(o)(3)

The HWC MACT prescribes that operating parameter limits for wet scrubbers be established under the hydrochloric acid and chlorine gas standard found in 40 CFR 63.1206(o)(3).
Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Pressure Drop Across a High Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(0)(3)(i)

Not applicable. There is not a high energy scrubber on the incinerators at Sauget.

Minimum Liquid Feed Pressure for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(iii)

Not applicable. There is not a low energy scrubber on the incinerators at Sauget.

Minimum pH - 40 CFR 63.1209(o)(3)(iv)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Liquid to Gas Ratio - 40 CFR 63.1209(o)(3)(v)

Not applicable. There is not a wet scrubber on the incinerators at Sauget.

<u>Unit 4</u>

Maximum Total Chlorine and Chloride Feedrate - 40 CFR 63.1209(o)(1)

The HWC MACT prescribes the establishment of the feedrate of total chlorine and chloride in association with both the SVM and LVM and the HCl/Cl_2 standards. The emission limits for SVM, LVM (i.e., metals),, and HCl/Cl_2 were demonstrated in the 2013 CPT. The feedrate of total chlorine and chloride includes the spiking rate and the contribution of chlorine with the waste streams – both pumpable and nonpumpable. The OPL for the maximum feedrate of total chlorine and chloride was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Maximum Flue Gas Flowrate or Production Rate - 40 CFR 63.1209(o)(2)

Flue gas flowrate, as stack gas flowrate, is monitored continuously by an Annubar.
The OPL for maximum flue gas flowrate in association with the standard for DRE was developed during the 1995 RCRA Trial Burn for Unit 4. During the 2013 CPT for Unit 4, the OPL for maximum flue gas flowrate was developed in association with the standards for PM, HCl/Cl_2, SVM, LVM, Mercury, and Dioxins/Furans. The OPL for maximum flue gas flowrate was established from the most stringent value of these tests, during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Dry Scrubber - 40 CFR 63.1209(o)(4)

The control devices on the incinerators at Sauget that are designed and operated to control HCl and Cl_2 are Spray Dryer/Absorbers, considered as Dry Scrubbers. The HWC MACT prescribes the establishment of OPLs for dry scrubbers in association with the HCl/Cl_2 standard.

Minimum Sorbent Feedrate - 40 CFR 63.1209(o)(4)(i)

The HWC MACT prescribes the establishment of an OPL for sorbent feedrate to a dry scrubber. The OPL for the minimum feedrate of sorbent to the Spray Dryer/Absorber (SDA) is measured as the feedrate of lime to the SDA, and was developed during the 2013 CPT for Unit 4 in association with the standard for HCl/Cl_2. The OPL for minimum sorbent feedrate to the SDA was established during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Minimum Carrier Fluid Flowrate or Nozzle Pressure Drop - 40 CFR 63.1209(o)(4)(ii)

The HWC MACT prescribes the establishment of an OPL for carrier fluid flowrate to a dry scrubber. The OPL for the minimum carrier fluid flowrate to the Spray Dryer/Absorber (SDA) was developed during the 2013 CPT for Unit 4 in association with the standard for HCl/Cl_2. The OPL for minimum sorbent feedrate to the SDA was established during the HCl/Cl_2 testing of the 2013 CPT of Unit 4.

Wet Scrubber - 40 CFR 63.1209(o)(3)

The HWC MACT prescribes that operating parameter limits for wet scrubbers be established under the hydrochloric acid and chlorine gas standard found in 40 CFR 63.1206(o)(3).
Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Pressure Drop Across a High Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(0)(3)(i)

Not applicable. There is not a high energy scrubber on the incinerators at Sauget.

Minimum Liquid Feed Pressure for Low Energy Scrubber - 40 CFR 63.1209(l)(2) and 40 CFR 63.1209(o)(3)(iii)

Not applicable. There is not a low energy scrubber on the incinerators at Sauget.

Minimum pH - 40 CFR 63.1209(o)(3)(iv)
Not applicable. There is not a wet scrubber on the incinerators at Sauget.

Minimum Liquid to Gas Ratio - 40 CFR 63.1209(o)(3)(v)
Not applicable. There is not a wet scrubber on the incinerators at Sauget.

- **Carbon Monoxide - 40 CFR 63.1203(a)(1)(i)**

Compliance with the standard for carbon monoxide was demonstrated at all times during the 2013 CPT.

- **Maximum Combustion Chamber Pressure - 40 CFR 63.1206(c)(5) and 40 CFR 63.1209(p)**

Units 2 and 3

Combustion system leaks are prevented through maintaining a totally sealed combustion chamber, coupled with the use of an induced draft fan that maintains a vacuum of normally -4 to -6 inches of water column in both combustion chambers while wastes are being fed to the unit.

Unit 4

The kiln is equipped with a double seal system that is comprised of overlapping, adjustable, stainless steel spring plates on both the feed and discharge ends of the kiln. The sealing edges of each plate are fitted with a sintered-metal wear shoe similar to a brake shoe with the inner seal resting on the kiln shell. The powdered metal formulation for the seal shoes include graphite granules, which make the shoes self-lubricating. The void between the seals and the outer shell of the kiln is pressurized to further prevent fugitive emissions. In addition to the kiln seal system, Unit 4 also utilizes an induced draft fan that maintains a vacuum of – 0.5 to – 1.0 inches water column while waste is being fired into the system.

- **Hazardous Waste Residence Time - 40 CFR 63.1206(b)(11)**

Units 2 and 3

The hazardous waste gas residence time for Unit 2 is calculated as follows using the OPL for the stack gas flowrate in the current NOC:

- Primary Combustion Chamber Volume – 635 ft^3;
- Secondary Combustion Chamber Volume – 635 ft^3;
- Total Volume – 1,270 ft^3;
- Maximum Flue Gas Flowrate – 15,147 acfm (252 ft^3/sec); and
- Total Combustion Zone Residence Time = (1,270 ft^3) / 252 ft^3/sec) = 5.0 sec.

Since Unit 2 is a fixed hearth unit, residence time is based on the travel length of the ash ram that functions to clear the primary combustion chamber of solid waste residue. A travel length of 110 inches for the ash ram has been established as the criteria for determining when solid waste is no longer in the combustion zone. In the case of an ash ram failure, an elapsed time of one hour has been established as the criteria for determining when solid waste is no longer in the combustion zone.

Unit 4

The hazardous waste gas residence time for the Unit 4 Rotary Kiln Incinerator is calculated as follows:

- Rotary Kiln Volume – 1,346 ft^3;
- Secondary Combustion Chamber Volume – 3,084 ft^3;
- Total Volume – 4,430 ft^3;
- Maximum Flue Gas Flowrate – 37,432 acfm (624 ft^3/sec); and
- Total Combustion Zone Residence Time = (4,430 ft^3) / (624 ft^3/sec = 7.1 sec.

Solids residence time in the Unit 4 kiln is dependent upon the kiln rotation rate, solids bed depth, and a number of other parameters set by design. The maximum solids hazardous waste residence time for the Unit 4 incinerator (i.e., in the rotary kiln) is 30 minutes based on calculations using an equation from Chemical Engineering Handbook, Perry's 5th Edition.

Based on the equation:

$$\text{Ø} = [(0.19L)/(NDS)]$$

Where:
Ø is the residence time in minutes,
L is the kiln length in feet,
N is the rotational speed in revolutions per minute,
S is the kiln slope in feet per feet, and
D is the internal diameter in feet.

Inserting the known values for L (35), N (2), S (0.0174), and D (6.5) result in a solids residence time for the rotary kiln of 30 minutes.