Continuous Monitoring Systems Performance Evaluation Test Plan

Veolia ES Technical Solutions, L.L.C.
Unit 3 Fixed Hearth Incinerator
Sauget, IL

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1.0 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).

In August and September of 2008, Veolia conducted tests of Units 2, 3, and 4 required by the information collection requests from USEPA 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. The test plans for these tests were approved by USEPA Region 5. The tests were designed to demonstrate compliance with the applicable emission standards of the HWC MACT for metals codified at 40 CFR § 63.1219(a)(2), 40 CFR § 63.1219(a)(3), and 40 CFR § 63.1219(a)(4) for mercury, cadmium and lead (i.e., Semivolatile Metals – SVM), and arsenic, beryllium, and chromium (i.e., Low Volatility Metals- LVM). The tests also established Operating Parameter Limits (OPLs) for mercury, and SVM and LVM codified at 40 CFR § 63.1209(l) and 40 CFR § 63.1209(n), respectively.

The initial Comprehensive performance tests 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. The Comprehensive Perfomance Tests were performed in accordance with Comprehensive Performance Test Plans approved by USEPA Region 5 on November 25, 2009. 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."* Veolia Sauget understands that EPA Region 5's position regarding commencement of the subsequent CPTs is based on the initiation of the metals tests performed in 2008, stating in a letter dated August 3, 2012 "Veolia must submit to EPA a notification of intent to conduct a CPT and a site-specific test plan for the CPT at least one year before the performance test. 40 CFR § 63.1207(e)(1)(i)…by September 5, 2012". Veolia is submitting to EPA its notification of intent and site-specific test plan for the subsequent CPT by this date.

This document is a Continuous Monitoring System Performance Evaluation Test Plan (CMS PETP) and is submitted with aComprehensive Performance Test Plan for Unit 3 for the subsequent comprehensive performance test (CPT) and provides notification that Veolia Sauget intends to start the CPTs of the three incinerators at the Sauget facility by September 5, 2013. All of 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 will be determined during the CPT.

The HWC MACT addresses the use of continuous monitoring systems (CMS) to demonstrate compliance with applicable operating parameters and emission standards. The CMS includes continuous emission monitoring systems (CEMS), which measure stack gas concentration, (e.g., carbon monoxide, oxygen, and continuous parameter monitoring systems (CPMS), which measure process operating parameters from the combustor and the associated air pollution control system (e.g., thermocouples, flow meters, pressure transmitters). This CMS PETP describes how Veolia plans to conduct a CMS Performance Evaluation Test of the Unit 3 incinerator to assess the performance of the CPMS and CEMS used to assure compliance with all of the applicable standards of the HWC MACT.

2.0 Performance Evaluation Test Plan Objectives

The objective of this site-specific CMS PETP is to demonstrate that components of the CMS used to assure compliance with all of the applicable standards of the HWC MACT are installed, calibrated and collecting quality data during operation of the Unit 3 incinerator. Veolia will use the Appendix to HWC MACT as well as the appropriate promulgated performance specifications provided in 40 CFR Part 60 Appendix B for CEMS. Manufacturers' recommendations and/or generally accepted testing procedures will be used to assess the performance of CPMS.

Veolia currently performs an automatic waste feed cutoff (AWFCO) system test on a bi-weekly basis to verify that the CMS is properly interlocked. Documentation of a bi-weekly check performed no more than 14 days prior to the Comprehensive Performance Test will be included in the CMS PET Report.

This CMS PETP was developed in accordance with 40 CFR 63.8(b)(2) of the MACT General Provisions.

3.0 Continuous Monitoring Systems (CMS) Description

The Unit 3 incinerator includes a continuous monitoring system (CMS) that continuously measures various emissions and process parameters required to assure compliance with the HWC MACT.

3.1 Continuous Emission Monitoring System (CEMS)

The CEMS continuously measure stack gas concentrations of carbon monoxide (CO) and oxygen (O_2). Carbon monoxide is monitored using a dual range monitor spanned from 0-200 ppmv, and 0-3,000 ppmv. The O_2 analyzer has a range of 0-25%. The Model Ecochem MC 3 carbon monoxide analyzer is an infrared analyzer, and the Model COSA oxygen analyzer uses a zirconium oxide electrochemical cell to detect oxygen concentrations in the stack gas.

3.2 Continuous Parameter Monitoring System (CPMS)

The CPMS continuously measures other process parameters that insure process emissions are within limits demonstrated during the Comprehensive Performance Test. The Unit 3 incinerator uses process instruments, including thermocouples, flow meters, and pressure transmitters to document compliance with applicable operating parameters. The process instruments used to monitor operating parameters on the Unit 3 incinerator to assure compliance with the standards of the HWC MACT are listed in Table 3-1.

3.3 Data Management

The process instruments and analyzers transmit operating data to the distributed control system (DCS) and data acquisition system (DAS) that performs the required data manipulations and calculations. The DAS compares computed values to the respective AWFCO limits. Process data is recorded in the facility computer database that is a part of the facility operating record.

As defined in 40 CFR 63.1209(b)(3) of the HWC MACT, the process instruments monitor the HWC MACT-regulated parameters without interruption. The DAS system evaluates the instrument response at least once every 15 seconds and computes and records the average values at least every 60 seconds. The calculations of rolling averages are performed as defined in 40 CFR 63.1209(b)(5).

The DAS does not use calibration data in the rolling average calculations. During periods of calibration, Veolia locks in the last measured value prior to calibration and holds this reading until the calibration is complete. Rolling averages are then calculated using all data recorded when waste is being fed to the incinerator.

Table 3-1. Process Instrumentation to Assure Compliance with the HWC MACTStandards

System	Monitoring Device	Equipment ID No.	Instrument Range
Total Pumpable Waste Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Total Waste Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
High BTU Liquid Feedrate	Mass Flow Meter	FT-315	0-3,600 lb/hr
Low BTU Liquid Feedrate	Mass Flow Meter	FT-316	0-3,600 lb/hr
Direct Inject Feedrate	Vehicle Scale	WT-315DI	0-60,000 lbs
Specialty Feedrate	Floor Scale	WT-304	0-4,000 lbs
Container Feedrate	Floor Scale	WT-310	0-400 lbs
Total LVM Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Pumpable LVM Feedrate[1]	Mass Flow Meter/Scales	DAS[1]	N/A
SVM Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Mercury Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Chlorine Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Ash Feedrate[1]	Mass Flow Meters/Scales	DAS[1]	N/A
Primary Combustion Chamber Temperature	Type K Thermocouple	TT-300 A/B	0-2,500 °F
Secondary Combustion Chamber Temperature	Type K Thermocouple	TT-319 A/B	0-2,500 °F
Primary Combustion Chamber Pressure	Pressure Transmitter	PT-300	-7.5-2.5 in WC
Secondary Combustion Chamber Pressure	Pressure Transmitter	PT-319	-7.5-2.5 in WC
Sorbent Feedrate	Flow Meter	I3-AT968	62.42 – 100 lb/ft^3
Carrier Fluid Flowrate	Flow Meter	FT-388	0-10 gpm
Baghouse Inlet Temperature (i.e.,Spray Dryer Adsorber Outlet Temperature)	Type K Thermocouple	TT-370	0-2,500 °F
Stack Gas Flowrate	Pitot Tube	FT-383	0-20,000 ACFM
Stack Carbon Monoxide Concentration	CEMS	AT-388E	0-200 ppm
			0-3,000 ppm
Stack Gas O_2 Concentration	CEMS	AT-389	0-25%

[1] Feedrate is tabulated within the DAS using measured individual stream feedrates. Total pumpable hazardous waste and total hazardous waste feedrates are summations of the applicable individual waste feedrates. Total LVM, pumpable LVM, SVM, mercury, chlorine, and ash feedrates are calculated based on the stream feedrates and analytical results of the applicable waste streams.

4.0 Performance Evaluation Program Summary

Veolia's Performance Evaluation Program has the objective of ensuring that components of the CMS are installed, calibrated, operated, and maintained so that valid operating data is collected to demonstrate the incinerator's compliance with the HWC MACT. Veolia will conduct a performance evaluation that will use the Appendix to HWC MACT and the appropriate promulgated performance specifications for CEMS provided in 40 CFR Part 60 Appendix B, and manufacturer's recommendations and/or generally accepted testing procedures will be used to assess the performance of CPMS.

4.1 Continuous Emission Monitoring Systems (CEMS)

Performance Evaluation of the CO and O_2 CEMS will follow the Relative Accuracy Test Procedure section of 40 CFR Part 60 Appendix B Performance Specification 4B – *"Specifications and Test Methods for CO and O_2 CEMS in Stationary Sources."* The Performance Evaluation test, i.e., RATA, will demonstrate that the CO and O_2 CEMS meet the relative accuracy criteria. The CO and O_2 CEMS are certified following 40 CFR Part 60 Appendix B Performance Specification 4B – *"Specifications and Test Methods for CO and O_2 CEMS in Stationary Sources."* A RATA will occur within 60 days of the Comprehensive Performance Test.

4.1.1 Installation

As defined in 40 CFR 63.8(c)(2), all CEMS shall be installed such that representative measurements of emissions from the affected source are obtained. Veolia has installed the CO and O_2 CEMS according to Performance Specification 4B.

4.1.2 Calibration and Performance Testing

The CEMS performance evaluation will be conducted using the Relative Accuracy Test Audit (RATA) method. The method is described in the following section. A RA test of the CEMS will be performed within 60 days of the Comprehensive Performance Test.

A RA test is a comparison of the CEMS response to a value measurement by a standard Reference Method (RM). The RA test is used to validate the calibration technique and verify the ability of the CEMS to provide representative and accurate measurements.

The Relative Accuracy Test Audit (RATA) will be conducted while the affected facility is treating hazardous waste. The RM tests will be conducted in such a way that the results will be representative of the emissions from the source and can be correlated to the CEMS data. A minimum of nine RM tests must be used to determine the RA. More than nine RM tests may be

performed, however, a maximum of three tests may be rejected from the RA determination, and all test results must be reported.

A RATA of the CO and O_2 CEMS will occur to coincide with the Comprehensive Performance Test, and will be performed within 60 days of completion of the Comprehensive Performance Test.

4.1.3 Operation and Maintenance

CEMS will be operated and maintained in accordance with Performance Specification 4B and manufacturer's written specifications or recommendations.

4.2 Continuous Process Monitoring System (CPMS)

4.2.1 Installation

As defined in 40 CFR 63.8(c)(2), all CMS shall be installed such that representative measurements of process parameters from the affected source are obtained. Veolia has installed all CPMS per manufacturer's written specifications or recommendations to obtain representative measurements.

4.2.2 Calibration

The CPMS components are calibrated using manufacturer's written specifications or recommendations. All instruments that are used to demonstrate compliance with applicable process operating parameters will be calibrated within 90 days of the Comprehensive Performance Test.

4.2.3 Operation and Maintenance

CPMS components are operated and maintained using manufacturer's written specifications or recommendations.

4.3 Automatic Waste Feed Cutoff (AWFCO) System

The CEMS and CPMS are integrated with the AWFCO system. The AWFCO system operates on a continuous basis and is designed for a partial system shutdown, which discontinues hazardous waste feed to the incinerator whenever one or more operating parameters or emission limits are reached. In addition, if the span of any CMS instrument is reached or if any CMS without a redundant back-up has failed, this will initiate an AWFCO. These limits exist to ensure that the incinerator is operating properly to comply with emission standards. Any attempt to operate outside of these limits will trigger an AWFCO. During an AWFCO, the control system activates an alarm and interrupts the hazardous waste feed to the incinerator. Hazardous waste feed to the incinerator will not resume until all parameters are within proper operating

limits. The AWFCO system is tested bi-weekly to ensure proper operation. A test of the AWFCO system will be performed within 14 days of the Comprehensive Performance Test.

5.0 Performance Evaluation Schedule

The CMS PET will be performed in accordance with manufacturer's written specifications or applicable EPA promulgated Performance Specifications. The CEMS and CPMS will be tested within 90 days of the Comprehensive Performance Test. The RATA of the CO and O_2 CEMS will be performed within 60 days of the Comprehensive Performance Test.

6.0 Quality Assurance Program

6.1 Data Quality Objectives (DQOs)

The CMS components are maintained to provide accurate and precise results.

6.2 Internal Quality Assurance

The internal quality assurance program includes routine activities performed by operators and analysts to provide assessment of CMS performance. This program contains the following:

- Daily walk through audits to check operational status of the CMS and to make necessary adjustments;
- Daily calibration drift checks to verify the CEMS accuracy; and
- CMS calibration tests to verify components are capable of meeting performance criteria.

A daily CEMS calibration check is performed manually by a technician. A report is generated daily which calculates the calibration drift. When the calibration check fails, an additional manual calibration or other corrective action is performed.

A control room operator is on duty at all times, monitoring and controlling the operations of the incinerator and ensuring that the CMS are operating.

6.3 External Quality Assurance

The external quality assurance program includes system audits that include the opportunity for on-site evaluation by the Administrator of instrument calibration, data validation, sample logging, and documentation of quality control data and field maintenance activities. This program contains the following:

- Quarterly Absolute Calibration Audits (ACA) for oxygen and carbon monoxide CEMS to provide a more rigorous and independent assessment of CEMS accuracy and reliability than is provided by the daily calibration (except during the quarter when the annual RATA is performed);
- Annual Relative Accuracy Test Audits (RATA) for CEMS to provide a more rigorous and independent quality assurance assessment of the CEMS accuracy and reliability than is provided by quarterly ACA;
- Review of CMS calibration, operation and maintenance procedures; and
- Review of calibration, operation and maintenance facility records.