APPENDIX I

ESV OPERATING PLAN

EMERGENCY SAFETY VENT PLAN

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1.0 INTRODUCTION AND BACKGROUND

Veolia ES Technical Solutions, LLC (Veolia) owns and operates two fixed hearth incinerators (Units 2 and 3) and a rotary kiln incinerator (Unit 4) at its facility located in Sauget, Illinois. These incinerators are subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Hazardous Waste Combustors (HWCs), Code of Federal Regulations (CFR), Part 63, Subpart EEE (§§ 63.1200 to 63.1221). The NESHAP for HWCs specifies emissions standards which reflect emissions performance of maximum achievable control technologies (MACT), and is commonly referred to as the HWC MACT.

Hazardous Waste Combustors are required to have an Emergency Safety Vent Plan and to keep the plan in the operating record. The *Emergency Safety Vent Plan* must follow the requirements described in § 63.1206(c)(4). This *Emergency Safety Vent Plan* demonstrates Veolia's compliance with these requirements. This plan includes information about the facility as it relates to the Emergency Safety Vent (ESV) systems, and procedures that will be followed during an ESV event. Table 1-1 presents the regulatory references related to the required ESV program and the section of this plan that addresses each specific requirement.

Due to the general applicability of the ESV requirement and the similarity of the incinerator systems, general references to an ESV or incinerator system in this document will imply all three systems. Information that is only applicable to one or two of the three systems will be clearly identified.

1.1 Summary of Facility Information

Brief summaries which describe the fixed hearth incinerators and the rotary kiln incinerator are presented in this section.

1.1.1 Fixed Hearth Incinerators

Each of the fixed hearth incinerators includes the following components:

- Feed equipment
- Primary and secondary combustion chambers
- Lime injection system
- Spray dryer absorber (SDA)
- Fabric filter baghouse

Table 1-1
Regulatory Requirements for Emergency Safety Vent Operating Plan and Corresponding Section that Addresses the Requirement

Regulatory Citation	Description	Plan Section
63.1206(c)(4)(i)	Documentation in operating record of an ESV opening while hazardous waste remains in the combustion chamber: (1) Record if ESV by-passed APCS (2) Determine if operation remained in compliance considering the emissions during the ESV	Section 2.2
63.1206(c)(4)(ii)(B)	Information documenting effectiveness of plan's procedures to maintain combustion chamber temperature and pressure, as is reasonably feasible	Section 3.5
63.1206(c)(4)(ii)(B)	Detailed procedures for rapidly stopping waste feed	Section 3.1
63.1206(c)(4)(ii)(B)	Detailed procedures for shutting down the combustor	Section 3.4
63.1206(c)(4)(ii)(B)	Detailed procedures for maintaining temperature in combustion chamber	Section 3.2
63.1206(c)(4)(ii)(B)	Detailed procedures for maintaining negative pressure in the combustion chamber	Section 3.3
63.1206(c)(4)(iii)	Investigation of ESV openings	Section 2.1
63.1206(c)(4)(iii)	Recording of ESV openings	Section 2.2
63.1206(c)(4)(iv)	Reporting of ESV openings	Section 2.3

- Solids and ash removal systems
- Induced draft (ID) fan and stack
- Instrumentation, controls, and data acquisition systems

Various solid and liquid wastes and gaseous feedstreams are thermally treated in the fixed hearth incinerators. Solid waste is fed to the primary (lower) combustion chamber via a feed conveyor system and pneumatic ram. Liquid waste from tanks and tanker trucks are fed to the primary combustion chamber through two atomized liquid injectors. Liquid waste from containers are fed to the primary combustion chamber through a specialty feed injector. A gaseous feedstream is fed to the Unit 2 primary combustion chamber directly from gas cylinders. Off gases from a hooded feed emission control system and from a waste handling glove box are fed directly to the Unit 3 secondary combustion chamber. Combustion chamber temperatures are maintained using natural gas fired to a dedicated burner in both the primary and secondary chambers.

Combustion gas exits the secondary combustion chamber and enters the SDA, which provides acid gas removal and cooling of the combustion gas. Combustion gas exits the SDA and is distributed to the fabric filter baghouses, which provide particulate matter removal. The induced draft fan, located downstream of the baghouses, moves the combustion gas through the system and exhausts the gas through the main stack.

1.1.2 Rotary Kiln Incinerator

The rotary kiln incinerator includes the following components:

- Waste feed system
- Primary and secondary combustion chambers
- Tempering chamber
- Lime injection system
- Spray dryer absorber
- Carbon injection system
- Fabric filter baghouse
- Solids and ash removal systems
- ID fan and stack
- Instrumentation, controls, and data acquisition systems

Various solid and liquid wastes are thermally treated in the rotary kiln incinerator. Solid wastes are fed to a ram feeder via a clamshell, a drum feed conveyor, and an auxiliary

feed conveyor. A hydraulic ram pushes the solid waste into the kiln. Liquid waste from tanks and tanker trucks is fed to the primary and secondary combustion chambers through atomized liquid injectors. Combustion chamber temperatures are maintained using natural gas fired to a dedicated burner in both the primary and secondary chambers.

Combustion gas exits the secondary combustion chamber and enters the tempering chamber, which provides cooling of the combustion gases. The combustion gas exits the tempering chamber and is distributed between two identical SDAs, which provide acid gas removal and additional gas cooling. A carbon injection system is utilized for controlling dioxin/furan and mercury emissions. The activated carbon is air injected into the combustion gas immediately downstream of the convergence of combustion gases from the SDAs. From the SDAs, combustion gas is distributed to fabric filter baghouses, which provide particulate matter removal. The ID fan, located downstream of the baghouses, moves the combustion gas through the system and exhausts the gas through the main stack.

1.2 Description of the ESV System

Each incinerator is equipped with an emergency safety vent (ESV) located at the top of the secondary combustion chamber. This ESV is a refractory-lined emergency thermal relief vent (TRV) which is held in the closed position by a pneumatic cylinder. The control valve in the line supplying air to the cylinder and the cylinder vent valve which opens the TRV are located in the control room for each unit. Valve locks (with keys attached) are utilized to deter indiscriminate operation of these valves. Opening of the TRV allows hot combustion gas to vent from the combustion system during emergency shutdown events. The purpose of the TRV is to protect the downstream APCS from excessive temperature situations.

Conditions which may warrant a TRV opening are summarized in Table 2-1. Typically, alarms and/or interlocks will be triggered prior to these conditions being present. Alarms provide the operator the opportunity to take measures in attempt to restore proper operating conditions. Otherwise, a controlled cutoff of the waste feeds, an AWFCO, or an emergency shutdown may occur prior to opening the TRV. If hazardous waste is being fed at the time the TRV is opened, the TRV position transmitter will detect the TRV opening and trigger an AWFCO.

Table 1-2
Thermal Relief Vent Openings

Parameter	Condition [1]
Electrical Supply	Loss of Power
Air Supply	Loss of Air Pressure (TRV will fail open)
ID Fan	Failure/Malfunction
SDA Exit Gas Temperature	> 500 °F
Emergency Shutdown	Operator's Discretion

[1] The operator is permitted to open the TRV if these conditions are present.

Unit 4 is equipped with a second ESV located at the kiln face. This ESV is referred to as the surge vent and is kept closed by a weighted louver. The surge vent will only open if there is a pressure excursion in the kiln sufficient enough to overcome the weighted louver. A deflector separates the escaping combustion gas from the feed, and the surge vent angles to a horizontal opening. This design minimizes the entrainment of solid through the surge vent.

An ESV opening may correspond with a malfunction event. Information regarding operation of the incinerator and the associated control equipment during times of start-up, shutdown and malfunction is provided in the facility *Start-up, Shutdown, Malfunction Plan* (SSMP).

2.0 ESV SYSTEM INVESTIGATION, DOCUMENTATION AND REPORTING

2.1 ESV Investigation

If an ESV opens for any reason during normal operations, the operator is instructed to:

1) Verify that all waste feeds to the incinerator are cutoff,
2) If possible, operate the ID fan, and
3) If possible, maintain normal combustion chamber temperatures on natural gas.

If hazardous waste is in the combustion chamber during a ESV opening, the incinerator supervisor should be notified as soon as possible. The incinerator supervisor will coordinate with technical staff to determine potential causes for the event and to estimate excessive emissions.

2.2 Documentation of ESV Opening

Each instance in which the emergency vent opens will be recorded in the facility operating record. This record will, at a minimum, include the date, time, and the operating mode at the time of the ESV opening. This data is automatically documented in the operating record by the CMS.

If the ESV opens when hazardous waste remains in the combustion chamber (*i.e.,* when the hazardous waste residence time has not expired) during an event other than a malfunction (as defined by the facility SSMP), Veolia personnel will document that an ESV event occurred, determine if the facility remained in compliance with facility emission standards, and record the findings of that determination in the facility operating record. Since the ESV is located upstream from the facility air pollution control devices (APCD), it is understood that combustion gas by-passes these emission control devices during an ESV event. This by-pass will be documented in the facility operating record.

If an ESV opening is attributed to a malfunction and occurs when hazardous waste remains in the combustion chamber, a malfunction recordkeeping form will be completed to document the event.

2.3 Reporting of ESV Openings

If an ESV opening results in a failure to meet the emission standards for the facility, Veolia will submit a written report within five days of the ESV event to Illinois Environmental Protection Agency (IEPA), documenting the results of the investigation and corrective measures taken. In most cases when an ESV event occurs, it is instantaneous. Therefore, it is practical to assume that diminimus emissions occur during these instantaneous events.

3.0 PROCEDURES DURING AN ESV

In the event of an ESV opening that occurs while burning waste, it is important that waste feed is stopped rapidly, and that combustion chamber temperature and negative pressure are maintained to the extent practical. Following the expiration of the hazardous waste retention time, shutting down the combustor (allowing key components to cool) is equally important. These items are addressed below.

3.1 Stopping Waste Feed and Shutting Down the Combustor

An ESV opening is likely to be preceded by a AWFCO or safety interlock that causes a waste feed cutoff prior to the ESV opening. The ESV position is also interlocked with the AWFCO system. These redundant measures ensure that waste feeds will be stopped during an ESV opening. If the AWFCO system fails to cutoff wastes to the incinerator, the waste will be manually cutoff in a quick and safe manner. Waste burning cannot resume until the ESV is closed, corrective actions taken, permission is granted from the incinerator supervisor, and all parameters are within limits.

3.2 Maintaining Combustion Chamber Temperature

Combustion chamber temperatures are maintained using natural gas fired a dedicated burner in both the primary and secondary combustion chambers. If possible, the burning of natural gas will be used to maintain adequate combustion chamber temperatures for the combustion of waste remaining in the incinerator.

3.3 Maintaining Negative Combustion Chamber Pressure

If possible, the ID fan will be operated during an TRV opening to minimize the quantity of combustion gas that by-pass the air pollution control equipment. Operation of the ID fan during an ESV opening will maintain negative combustion pressure to the full extent that is reasonably feasible. It is likely that the opening of the TRV will cause the system to lose negative pressure (*i.e.* the ID fan cannot induce a strong draft). For surge vent opening, the positive pressure excursion will be temporary, and the ID fan (if operable) will be used to restore negative pressure in the primary chamber, as quickly as possible.

3.4 Shutting Down the Combustor

An event which causes an ESV opening may require a cold shut down of the combustor in order to perform corrective actions. After sufficient effort is taken to minimize emissions by maintaining the temperature and pressure, the incinerator supervisor will decide if a shut down is warranted. If the ESV opening corresponds with a malfunction

event then the corrective measures taken will be consistent with the procedures prescribed by the SSMP.

3.5 Documentation of Combustion Chamber Pressure and Temperature Maintenance

§ 63.1206(c)(4)(ii)(B) requires that the facility demonstrate that the procedures of this plan are adequate to maintain combustion chamber pressure and temperature while hazardous waste remains in the incinerator, if feasible. The occurrence of an emergency safety vent opening at the Veolia facility is possible only in a select set of circumstances, which are described in Section 1.2 of this plan. If natural gas cannot be burned, it is not feasible to maintain the combustion chamber temperature during an ESV event. Likewise, it is likely that the opening of the TRV will result in the loss of negative pressure. The duration of a surge vent opening will typically be brief and only momentarily prevent maintaining the combustion chamber pressure. The procedures presented in this plan will be followed to minimize the effects of such occurrences.