UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

April 13, 2017

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Ms. Celena J. Cage, Administrator, Enforcement Division
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, La. 70821-4312

Re: Transmittal of NEIC Investigation Report redacted by Denka Performance Elastomer, LLC

Dear Ms. Cage:

On June 6-10, 2016, the U.S. Environmental Protection Agency's National Enforcement Investigations Center (NEIC) conducted a Clean Air Act Compliance Investigation of Denka Performance Elastomer, LLC's ("DPE") elastomers facility in LaPlace, Louisiana. Following the investigation, an Investigation Report, dated October 2016, was sent by NEIC to the Region 6 Enforcement Division. As a standard practice, Region 6 posts inspection reports to the EPA's public website except when the report or information contained therein is subject to protections, such as for confidential business information. Please note that DPE has redacted certain portions of the Investigation Report over which it asserts a claim of business confidentiality.

All inspection reports that are posted to the web are based upon observations made by the inspectors during the inspection and using information provided by the subject facility. Any finding identified in an inspection report may be subject to change based on new or additional information and/or technical discussions with the facility. Specifically, here, after the issuance of NEIC's inspection report, DPE submitted additional information to EPA in December 2016 that initially indicates that the hydrochloric acid production furnace (HAPF) discussed in potential areas of noncompliance 12 through 16 has operational restrictions and automatic waste feed cut-off valves that could affect the number of alleged parameter exceedances identified in the NEIC Report. EPA Region 6 is currently conducting a detailed review of the additional information.

If you have any questions, please call James Leathers at (214) 665-6569 or Justin Lannen at (214) 665-8130.

Sincerely yours,

Steve Thompson,
Chief
Air Enforcement Branch

Enclosure

cc (without enclosure): Robert Holden, Liskow & Lewis

CBI REDACTED COPY--LISKOW & LEWIS--MARCH 29, 2017

[redacted]

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

National Enforcement Investigations Center

NEIC

NEICVP1216E01

FOCUSED CLEAN AIR ACT COMPLIANCE INVESTIGATION

Denka Performance Elastomer LLC
La Place, Louisiana
NEIC Project No.: VP1216

October 2016

Project Manager:

Doreen Au, Chemical Engineer

Other Contributors:

Armando Bustamante, Environmental Engineer
Martha Hamre, Chemical Engineer
Matthew Schneider, Chemical Engineer
Bill Squier, Mechanical Engineer
David Holzwarth, Information Technology Specialist
Richard Helmich, Ph.D., Principal Analytical Chemist

Prepared for:
EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202

Authorized for Release by:

Suzanne Schulman, Civil Services Section Chief

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
P.O. Box 25227
Building 25, Denver Federal Center
Denver, Colorado 80225

CONTENTS

TABLES

FIGURE

APPENDICES (*NEIC-created documents)

APPENDICES (*NEIC-created documents) (continued)

This Contents page shows all of the sections contained in this report and provides a clear indication of the end of this report.

INTRODUCTION

At the request of U.S. Environmental Protection Agency (EPA) Region 6, EPA's National Enforcement Investigations Center (NEIC) conducted a focused Clean Air Act (CAA) compliance investigation of Denka Performance Elastomer LLC (DPE) in La Place, Louisiana. NEIC conducted the on-site compliance investigation from June 6–10, 2016. DPE's operations and associated waste streams are subject to major environmental statutes, including the Clean Air Act (CAA), Clean Water Act (CWA), and Resource Conservation and Recovery Act (RCRA). DPE's operations are also subject to the requirements of environmental permits and regulations administered by the EPA and the Louisiana Department of Environmental Quality (LDEQ).

FACILITY BACKGROUND

DPE operates a synthetic rubber manufacturing facility that manufactures 2-chlorobuta-1,3-diene (hereafter referred to as chloroprene or CD) and polymerizes the chloroprene to manufacture different formulations of neoprene referred to as "types." [redacted]

DPE purchased the facility from E.I. DuPont de Nemours (DuPont) on or about November 1, 2015. DPE retained 235 of 240 employees from DuPont. DPE is a joint venture owned by Denka Company Limited (70 percent) and Mitsui Company (30 percent). DPE is a major source of hazardous air pollutants (HAPs). The majority of chloroprene emissions are generated by two processes: the chloroprene process and the neoprene process. The CAA Title V operating permit for the chloroprene process (permit No. 3000-V5) was issued to DuPont on September 9, 2014, expiring on April 26, 2017. The Title V permit for the neoprene process (permit No. 2249-V8) was issued to DuPont on June 15, 2015, expiring on May 15, 2019. On November 12, 2015, DPE submitted a request to LDEQ to transfer these permits, as well as other additional permits, from DuPont to DPE.

Photographs taken during the on-site inspection are included in **Appendix A.** Emission sources at this facility include distillation towers, polymer kettles, storage vessels, a boiler, a flare, drying lines, strippers, the wastewater treatment system, and process fugitives.

ON-SITE INSPECTION SUMMARY

NEIC conducted the on-site inspection from June 6–10, 2016. EPA Region 6 inspectors James Leathers, Justin Chen, and Sarah Frey and LDEQ inspector Daniel Odem participated in and/or observed the on-site inspection. During the opening conference, NEIC inspectors presented credentials to Patrick Walsh, DPE's safety, health, and environmental manager, and Douglas Melancon, environmental engineer. During the on-site inspection, DPE representatives provided a site orientation walking tour, a detailed facility description, process area walkthroughs, and documentation/records pertaining to the focused CAA investigation. NEIC inspectors reviewed records and documents, performed a visual inspection of the facility, performed comparative EPA Reference Method 21 monitoring, collected wastewater samples, and interviewed DPE personnel. At the conclusion of the on-site inspection, an exit meeting was held to discuss preliminary findings. NEIC personnel stated that final determinations would be made in conjunction with EPA Region 6 personnel.

Clean Air Act

NEIC inspectors investigated DPE's compliance with the following CAA regulations applicable to the facility operations:

- 40 CFR Part 63 Subpart U – National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins (Polymers and Resins I MACT).
- 40 CFR Part 63 Subpart G – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater (HON)
- 40 CFR Part 63 Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks (Leak Detection and Repair [LDAR] Requirements)
- 40 CFR Part 63 Subpart EEE – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors (Hazardous Waste Combustor MACT)

DPE relies on DuPont's applicability determinations regarding DPE's compliance with 40 Code of Federal Regulations (CFR) Part 63 Subparts G, U, and EEE. DPE also uses DuPont's emission calculation methodology for calculating annual air emissions.

Process Description

Chloroprene (Monomer Area)

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Neoprene (Polymers Area)

According to DPE, 27 types of neoprene are made on-site. Approximately 65 to 75 million pounds (lbs) of neoprene are made annually. Some of these products are considered liquid dispersion types, in which neoprene polymer is suspended in water, and is not dried and further processed. NEIC generated a process flow diagram based on process information provided by DPE engineers (**Appendix C**).

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

40 CFR Part 63 Subpart G – Hazardous Organic NESHAP (HON)

Process Vents

DPE relies on DuPont's applicability determinations for the chloroprene process. DuPont submitted a notification of compliance status (NOCS) for the chloroprene process dated September 16, 1997 (**Appendix D**). In this document, one Group 1 process vent is identified, the mole sieve vent with a total resource effectiveness (TRE) value of 0.098. This stream is discharged to a flare. DuPont also identifies the CD vent condenser (TRE value of 2.11) as a stream that has a TRE value between 1 and 4 and requires additional monitoring. In addition, seven vent streams have a TRE value greater than 4: pentane column, heads column, topper column, refiner column, recovery column, isom distillation columns, and isom reactor vent.

[redacted]

Because the TRE value of the CD vent condenser was between 1 and 4, DPE is required to monitor the exit temperature of the product exiting the condenser to ensure that the TRE value does not drop below 1. DPE relied on modeling data provided by DuPont in 1997 and the chloroprene Title V permit 3000-V5, Part 70, Specific Condition 2 (**Appendix E, p. 56 of 185, and p. 79 of 185**), which requires the cooling media (brine temperature) to remain below 10 °C to maintain a TRE value above 1. Monitoring the temperature of the cooling media instead of the outlet temperature of the vent stream does not indicate how effectively the condenser is operating. In addition, the brine temperature was established based on the 1997 configuration, which is different from the current configuration of the plant.

The following language is identical in the 1997 and 2015 regulations:

40 CFR § 63.117(a) *Each owner or operator subject to the control provisions for Group 1 process vents in §63.113(a) or the provisions for Group 2 process vents with a TRE index value greater than 1.0 but less than or equal to 4.0 in §63.113(d) shall: (1) Keep an up-to-date, readily accessible record of the data specified in paragraphs (a)(4) through (a)(8) of this section, as applicable...*

40 CFR § 63.117(a)(7) states, *Record and report the following when achieving and maintaining a TRE index value greater than 1.0 but less than 4.0 as specified in §63.113(a)(3) or §63.113(d) of this subpart. (i) The parameter monitoring results for absorbers, condensers, or carbon adsorbers, as specified in table 4 of this subpart, and averaged over the same time period of the measurements of the vent stream flow rate and concentration used in the TRE determination (both measured while the vent is normally routed and constituted)*

Table 4 to Subpart G of Part 63 – Process Vents – Monitoring, Recordkeeping, and Reporting Requirements for Maintaining a TRE Index Value >1.0 and <= 4.0

Final recovery device	Parameters to be monitored	Recordkeeping and reporting requirements for monitored parameters
Condenser	*Exit (product side) temperature [63.114(b)(2)]*	*1. Continuous records.* *2. Record and report the exit temperature averaged over the full period of the TRE determination – NCS.* *3. Record the daily average exit temperature for each operating day.* *4. Report all daily average exit temperatures that are outside of the*

Final recovery device	Parameters to be monitored	Recordkeeping and reporting requirements for monitored parameters
		range established in the NCS or operating permit – PR (periodic report).

DPE does not monitor the product side temperature as required by 40 CFR § 63.117(a)(7); instead, as stated above, it monitors the condenser brine temperature. The original NOCS in 1997 identifies that DuPont will monitor the condenser brine temperature, per 40 CFR § 63.117(a)(7), which is not the parameter required to be monitored. No alternative to this requirement was requested by either DuPont or DPE as part of the 1997 NOCS. However, this requirement is listed in the chloroprene Title V permit, as noted previously.

Storage Vessels

Chloroprene manufactured in the monomer area is stored in a 2 million (MM) pound chloroprene storage tank (emission point 1700.21A) in the polymers area and in other smaller crude CD tanks. The chloroprene is refined in the polymers area and then is used in the manufacture of neoprene. DuPont did not list these storage vessels as being subject to HON requirements in the initial HON notification in December 1997 **(Appendix D)**. Instead, DuPont listed these as Group 2 tanks in the vessel evaluation for the Polymers and Resins I MACT in the November 2001 NOCS **(Appendix F)**.

Wastewater

DPE and DuPont have sampling data for chloroprene concentrations from the DCB JVC effluent tank and isomerization JVC effluent tank. DPE provided DCB JVC results from 2011–2016 (up to NEIC inspection date). This information is in **Appendix G**. Isom JVC results are in **Appendix H**. DuPont also conducted wastewater sampling for wastewater streams in 2014, and the results are included in **Appendix I**. According to a DPE process engineer, the DCB JVC effluent tank is the same as stream 1 in the DCB Refining JVC Effluent Stream in the 2014 sampling plan. The isomerization effluent tank is the same as stream 2 in the ISOM JVC Effluent Stream in the 2014 sampling plan, and is also known as MP in the 2011–2016 data.

From the DCB JVC effluent tank, the highest measured concentration of beta chloroprene was 1813.39 parts per million (ppm) on September 4, 2012. From sampling data from 2011–2016, the average concentration of the 176 samples taken was 85 ppm. Beta chloroprene is another name for chloroprene with CAS number 126-99-8, which is listed on EPA's hazardous air pollutant list. For the same location in the 2014 wastewater sampling event, chloroprene was "non-detect."

Effluent from the isomerization JVC effluent tank is injected into non-hazardous deep wells. From the isomerization JVC effluent tank, the highest measured concentration of chloroprene was 722.74 ppm on December 7, 2015. From sampling data from 2011–2016, the average concentration of the 131 samples taken was 37 ppm. For the same location in the 2014 wastewater sampling event, chloroprene was non-detect.

40 CFR Part 63 Subpart H – Leak Detection and Repair Requirements

According to DPE's LDAR procedure (**Appendix J**), DPE follows a fugitive emissions consolidated source agreement, effective January 1, 2014. This agreement allows for the site to comply with the most stringent fugitive emissions rule, identified as 40 CFR Part 63 Subpart H. The facility submits a semiannual fugitive emissions consolidated agreement periodic report. In DPE's February 15, 2016, semiannual fugitive emissions report, it reported that, for November and December 2015, it monitored a total of 5 connectors, 4,339 valves, 256 pumps, 2 compressors, 345 instrumentation systems, 25 agitators, and 515 pressure relief devices (**Appendix K**).

LDAR Program Background

DPE currently has approximately 32,500 active components in three process units that are subject to LDAR requirements. **Table 1** shows, for each LDAR-regulated process unit, the unit name and the total number of components by type in organic hazardous air pollutant service, based on the facility recordkeeping database at the time of the NEIC inspection. DPE monitors for fugitive leaks of organic HAPs from valves, pumps, connectors, pressure relief devices, compressors, and other types of equipment, in accordance with EPA Reference Method 21 (40 CFR Part 60, Appendix A), as referenced by 40 CFR § 63.180(b)(1).

At the time of the NEIC inspection, DPE contracted with Emission Monitoring Service, Inc. (EMSI) to perform monitoring of equipment subject to LDAR requirements. Before DPE purchased the facility in November 2015, DuPont had contracted with Guardian Compliance for monitoring of equipment subject to LDAR requirements. Monitoring is performed using a toxic vapor analyzer (TVA), model 1000B instrument.

Table 1. PROCESS UNIT COMPONENTS IN ORGANIC HAP SERVICE
Denka Performance Elastomer LLC
La Place, Louisiana

Process Unit	Valves	Pumps	Connectors	Agitators	Compressors	Instrumentation Systems	Open-ended Lines	Relief Devices
Chloroprene	3,703	79	16,159	3	2	428	729	22
Hydrochloric acid (HCl) recovery	471	19	3,125	0	0	3	97	8
Neoprene	1,176	43	5,818	2	0	179	407	28

Recordkeeping and Reporting

DPE uses the LeakDAS® database software to manage information pertaining to its LDAR program. The database functions as the central repository for equipment monitoring frequency, repair history, and other information related to LDAR requirements. NEIC received copies of DPE's LeakDAS® data tables for February 2013–December 2015 (archived) and November 2014--June 2016 (current), and reviewed the information for DPE's compliance with 40 CFR Part 63 Subpart H requirements. A transition to a new tagging system of components in the LDAR program occurred during the overlapped time of the archived and current databases.

Component inventories were tabulated for active components in each set of data tables. Comparison of active component inventories between the archived and current data tables shows active component inventories of 21,659 (archived) and 32,501 (current), which is an increase of 10,842 active components in the current data tables. 40 CFR Part 63 Subpart H requires that equipment that is subject to the requirements of this subpart to be identified such that it can be distinguished from equipment that is not subject to the requirements.

Repair Requirements

Based on information in the facility's LDAR recordkeeping database, DPE failed to perform final repairs to one valve or to place the component on the delay-of-repair list, within 15 days of identification of the leak, between February 2013 and June 2016. **Appendix L** identifies the component, along with the date and time the leaks were determined.

DPE also failed to perform a first attempt at repair of one valve within the required timeframe between February 2013 and June 2016. **Appendix M** identifies the missed first attempt at repair and related monitoring and repair history.

Investigation Monitoring/Field Audit Results

NEIC inspectors performed comparative monitoring in two DPE process units: the chloroprene unit and the neoprene unit. All monitoring was conducted using Thermo TVAs. In accordance with NEIC operating procedures, the TVAs were calibrated daily using certified methane-in-air calibration gases. Monitoring and field audit results are presented in **Appendix N.**

NEIC inspectors monitored 2,155 valves, 5,059 connectors, 62 pumps, 13 agitators, 4 pressure relief devices, and 514 open-ended lines and identified 31 valves and 20 connectors leaking in excess of 500 ppm and 1 pump leaking in excess of 1,000 ppm. NEIC inspectors notified DPE escorts and EMSI personnel of each leak identified, and EMSI personnel verified all leaks with their instruments during the on-site inspection. **Table 2** lists the number of valves, connectors, pumps, agitators, open-ended lines, and pressure relief devices that NEIC inspectors identified as leaking; the total components monitored; and a calculated leak rate for each component type.

Table 2. EPA MONITORING RESULTS
Denka Performance Elastomer LLC
La Place, Louisiana

Process Unit	Total Leaking	Total Monitored	Percent Leaking
Chloroprene			
Valves	30	1,555	1.93
Connectors	12	3,337	0.36
Pumps	1	48	2.08
Agitators	0	1	0
Open ends	*	234	*
PRDs	0	4	0
Neoprene**			
Valves	1	600	0.17
Connectors	8	1,722	0.46
Pumps	0	14	0
Agitators	0	12	0
Open-ended lines	*	280	*

* For any open-ended lines and plugs that were monitored and leaking above 500 ppm, the leak was attributed to the adjacent valve.
** The neoprene unit was not processing material at the time of the NEIC LDAR inspection.

DuPont submitted a semiannual fugitive emissions consolidated source agreement periodic report for the semiannual period of July 1, 2015, through December 31, 2015 **(Appendix O)**. This report summarized the leak rate for each component type over the entire site. DuPont monitored 4,712 valves in the third quarter of 2015 and identified two leaking valves for a leak rate of 0.04 percent. The other component types had zero leak rates for this monitoring period.

While performing comparative monitoring at DPE, NEIC inspectors identified 514 open-ended lines. 40 CFR Part 63 Subpart H requires open-ended valves or lines to be equipped with a cap, blind flange, plug, or a second valve, except if the valves or lines contain material that would autocatalytically polymerize. DPE representatives stated that the fluid in the process lines would autocatalytically polymerize and, therefore, the process lines are exempt from the requirement of being equipped with a cap, blind flange, plug, or second valve.

NEIC inspectors observed throughout the plant open-ended lines on piping that was labeled as containing toluene. NEIC inspectors also observed some plugs, second closed valves, and blind flanges on a few open-ended lines, but many other open-ended lines in the same chemical service without them. The majority of the valve leaks identified during the on-site comparative monitoring were from open-ended lines where the leak was attributed to the adjacent valve. DPE has not provided EPA with any documentation identifying which chemicals in which specific lines meet the exemption.

40 CFR Part 63 Subpart U – Polymers and Resins I MACT

The notification of compliance status report DuPont submitted on November 13, 2001 **(Appendix F)** for the Polymers and Resins Group I MACT indicates that it has four Group 2 storage vessels and ten Group 2 process vents, and is subject to no back-end provisions. In a July 13, 2011, letter, DuPont notified that it is subject to back-end provisions under 40 CFR § 63.499, and would achieve the residual limits by using strippers with three condensers in series **(Appendix P)**. DuPont also stated that the applicable HAP emission limitation is 0.00091 megagram (Mg) HAP/Mg neoprene produced. The January 2016 semiannual report DuPont submitted in accordance with 40 CFR Part 63 Subpart U indicated that its calculated back-end HAP emission rate was 0.00087 Mg HAP/Mg neoprene **(Appendix Q)** from July 1–October 31, 2015.

Front-end Process Vents

[redacted]

In 2008, DuPont appears to have recalculated the batch emission rate at the exit of the common condenser. In accordance with 40 CFR § 63.488(a)(2), the annual uncontrolled organic HAP emissions should be calculated at the exit of the batch unit operation. A primary condenser would be considered part of the batch unit operation if it refluxes back to the unit. Because the common condenser, in this situation, recovers HAP, but does not reflux them, the vent stream exiting the poly kettle, prior to the common condenser, is the exit of the batch unit operation.

DPE provided calculations performed for the emission rate at the exit of the common condenser. These calculations were documented in the *Neoprene Unit Polymers and Resins I Compliance Manual* revised July 2008 **(Appendix R)**. These calculations also provide information regarding the vent stream entering the common condenser, per charge. Using this inlet calculation and DPE's production record from 2015, each poly kettle has greater than 225 charges per year, and, therefore, each kettle generates greater than 26,000 pounds of HAP emissions a year, and each kettle's vent meets the definition of a Group 1 batch front-end process vent per 40 CFR § 63.482.

The flash cooler vent is also part of the front-end process; however, neither DPE nor DuPont evaluated this vent stream under this regulation (**Appendix R, p. 8**). Based on the definition in 40 CFR § 63.482, the vent is part of the front-end process because the flash cooler is part of the stripping operation.

DPE also relied on DuPont's TRE calculations for the front-end continuous process vent from the CD refining column and the three stripping units. DPE was unable to explain the specific locations in the process where DuPont evaluated the TRE values. Therefore, NEIC could not determine if the TRE calculations were performed at the appropriate locations. The TRE values that were calculated indicate that each stream had a TRE value between 1 and 4, and additional monitoring is required on the condensers to ensure that the stream did not become a Group 1 continuous process vent. DPE relies on an alternative monitoring request submitted by DuPont allowing it to monitor the temperature of the brine, rather than the temperature of the exiting stream.

Back-end Process Vents

Following stripping, the back-end provisions are designed to limit the emissions from unreacted monomers in the polymer after stripping. According to 40 CFR § 63.494 (a)(4)(iii), the back-end organic HAP emission limit shall be calculated by dividing 30 Mg/year (yr) by the mass of neoprene produced in 2007. DPE provided information that the DuPont-calculated limit was 0.00091 Mg HAP/Mg neoprene produced.

To determine compliance with this limit, DPE uses its production rate and emission factors for residual chloroprene and toluene for different neoprene types. Factors for liquid dispersion neoprene are averaged, since liquid dispersions are sampled and analyzed for each LD type due to customer requirements for residual chloroprene content. The remaining factors for types 1–9 were from samples collected at the Pontchartrain site in 1996, and types 10–15 were from samples collected at the Louisville site in 1992 (**Appendix S**).

Storage Vessels

DPE relies on DuPont's regulatory analysis for storage vessels. The November 13, 2001, Polymers and Resins I Notification of Compliance Status (**Appendix F**) lists four storage tanks that contain chloroprene that DuPont listed as Group 2 storage tanks (**Table 3**).

Table 3. STORAGE VESSELS
Denka Performance Elastomer LLC
La Place, Louisiana

Emission Point	Vessel Name	Liquid Stored	Volume (gallons)	Vapor Pressure of HAPs (psi)	Type of Source	Group Status

1700-21.1	Crude Storage Tank No. 1	Chloroprene	50,000	0.7	Storage tank	2
1700-21.2	Crude Storage Tank No. 2	Chloroprene	22,000	1.39	Storage tank	2
1700-21.3	Crude Storage Tank No. 3	Chloroprene	25,750	1.46	Storage tank	2
1700-21A	2 MM Pound CD Storage Tank	Chloroprene	279,700	0.7	Storage tank	2

DPE provided NEIC no additional information about how the vapor pressure for each tank was determined. The storage vessel provisions in 40 CFR § 63.484 state that the owner or operator should comply with the storage vessel requirements in 40 CFR §§ 63.119 through 63.123 and 63.148. Table 3 to 40 CFR Part 63 Subpart U defines a Group 1 storage vessel. **Table 4** provides the information in Table 3 to 40 CFR Part 63 Subpart U in its original units, and then in gallons and psi, as DuPont uses.

Table 4. GROUP 1 VESSEL CAPACITY AND VAPOR PRESSURE CONVERSIONS
Denka Performance Elastomer LLC
La Place, Louisiana

Vessel capacity (cubic meters)	Vessel capacity (gallons)	Vapor pressure[a] (kilopascals [kPa])	Vapor pressure[a] (psi)
75 ≤capacity <151	19,812.9 ≤capacity <39,890	≥13.1	≥1.9
151 ≤capacity	39,890 ≤capacity	≥5.2	≥0.75
[a] Maximum true vapor pressure of total organic HAP at storage temperature.			

EPA lists the vapor pressure for chloroprene at 20 °C (68 degrees Fahrenheit [°F]) at 188 millimeters of mercury (mmHg) (*https://www3.epa.gov/ttn/atw/hlthef/chloropr.html*). The 2013, 2014, and 2015 emission inventory calculations list the 1700-21A, 2 MM pound CD storage tank contents as 100 percent chloroprene and a daily average liquid surface temperature of 466.8 rankine (R) (7.13 °F). According to the monomer plant diagram, this tank is cooled with -18 °C (-1 °F) brine.

Emission ID points for crude storage tanks 1, 2, and 3, 1700-21.1, 1700-21.2, and 1700-21.3, are not listed in the 2013, 2014, and 2015 emission inventory calculations (**Appendices T, U, and V**); however, the tab "1700-63" includes crude storage tanks 1 2, and 3. This tab lists the temperature of the vapor in the common vent header as 5 °C (41 °F).

NEIC used the Antoine equation and associated chloroprene Antoine equation parameters to estimate the vapor pressure of the tanks based on the temperatures provided in DPE's emission calculations.[1] NEIC also calculated the temperature at which the chloroprene in the tank would exceed the vapor pressure threshold for Group 1 storage vessels and additional controls would be required.

Table 5. STORAGE VESSEL CALCULATED TEMPERATURES AND ASSOCIATED VAPOR PRESSURES
Denka Performance Elastomer LLC
La Place, Louisiana

Emission Point	Vessel Name	Volume (gallons)	Temperature per emission inventory (°F)	Calculated Vapor Pressure (psi) at Temperature in Emission Inventory	Group Status	Minimum Temperature (°F) to be Group 1 Storage Tank	Calculated Vapor Pressure (psi) at Minimum Temperature to be Group 1 Storage Tank
1700-21.1 (1700-63)	Crude Storage Tank No. 1	50,000	41	1.62	1	17	0.77
1700-21.2 (1700-63)	Crude Storage Tank No. 2	22,000	41	1.62	2	47	1.92
1700-21.3 (1700-63)	Crude Storage Tank No. 3	25,750	41	1.62	2	47	1.92
1700-21A	2 MM Pound CD Storage Tank	279,700	7	0.54	2	17	0.77

The 2008 polymers and resins compliance manual **(Appendix R)** lists emission points 1700-63.1 and 1700-63.2 as CD Solution Tanks with volumes of less than 19,815 gallons and emission points 1700-63.3 and 1700-63.4 as recovered CD tanks with volumes of less than 19,815 gallons. If these tanks were repurposed from crude storage tanks, different volumes are reported for the tanks.

Surge Vessels

DPE relies on DuPont's regulatory analysis for surge control vessels. 40 CFR § 63.481 states that existing sources should be in compliance by June 19, 2001. 40 CFR § 63.502 (a) requires that facilities comply with the provisions of 40 CFR Part 63 Subpart H. Surge control vessels are listed under 40 CFR Part 63 Subpart H, 40 CFR § 63.170. CFR § 63.502(a) also allows facilities with surge control vessels that require control under 40 CFR § 63.170 (Subpart H) to choose to comply with the Group 1 storage vessel provisions in 40 CFR § 63.484.

In the November 2001 polymers and resins I NOCS **(Appendix F)** and the 2008 polymers and resins I compliance manual **(Appendix R)**, DuPont identified that the vent stream from the surge vessel, refined CD tank, associated with the CD refining column either would be required to either route back to the process through a closed vent system, or route to a control device, or to comply with floating roof control requirements to meet regulatory standards. DuPont chose to

[1] NIST Chemistry Webbook, 2-chloro-1,3-butadiene. http://webbook.nist.gov/cgi/cbook.cgi?ID=C126998&Units=SI&Mask=4#Thermo-Phase. Accessed August 10, 2016.

route the refined CD tank vent stream back to the uncontrolled crude CD tanks, which then vent to the atmosphere. DuPont states that this is routing the vent stream back to the process, because instead of using nitrogen to vapor-balance the crude CD tanks, the refined CD vapors would provide the vapor balance and no additional emissions of chloroprene would be released from the crude CD tanks. No engineering calculations, modeling, or testing were included to support these statements.

Wastewater

DPE relies on DuPont's engineering analysis of the wastewater streams from the condensers in the neoprene process, contained in the 2008 polymers and resins compliance manual **(Appendix R)**. The engineering analysis states that chloroprene concentrations in wastewater could not exceed 1,000 ppm based on its solubility. Neither DuPont nor DPE conducted sampling to verify this engineering analysis.

40 CFR Part 63 Subpart EEE – Hazardous Waste Combustor MACT

DPE operates a hydrochloric acid production furnace (HAPF), which generates hydrochloric acid by incinerating chlorinated organic hazardous waste derived from on-site processes. The HAPF system consists of two parallel combustion chambers, a series of absorbers to recover HCl, and a DynaWave scrubber as a final air pollution control device. The HAPF is subject to the Hazardous Waste Combustor MACT emission standards for existing hydrochloric acid production furnaces that burn hazardous waste at facilities that are major sources of hazardous air pollutants.

The Hazardous Waste Combustor MACT requires DPE to meet emission standards for various pollutants, as shown in **Table 6**:

Table 6. HAZARDOUS WASTE COMBUSTOR MACT EMISSION STANDARDS
Denka Performance Elastomer LLC
La Place, Louisiana

Pollutant	Emission Standard	Regulatory Citation
Dioxins and furans	Compliance with the CO and HC emission standards	40 CFR § 63.1218(a)(1)
Mercury	Compliance with the HCl/Cl_2 emission standard	40 CFR § 63.1218(a)(2)
Semivolatile metals	Compliance with the HCl/Cl_2 emission standard	40 CFR § 63.1218(a)(3)
Low volatile metals	Compliance with the HCl/Cl_2 emission standard	40 CFR § 63.1218(a)(4)
Hydrogen chloride and chlorine (HCl/Cl_2)	150 ppmv dry or 99.923% system removal efficiency (SRE)	40 CFR § 63.1218(a)(6)
Particulate matter (PM)	Compliance with the HCl/Cl_2 emission standard	40 CFR § 63.1218(a)(7)
Carbon monoxide (CO)	100 ppmv	40 CFR § 63.1218(a)(5)(i)
Hydrocarbons (HC)	10 ppmv	40 CFR § 63.1218(a)(5)(i)

Table 6. HAZARDOUS WASTE COMBUSTOR MACT EMISSION STANDARDS
Denka Performance Elastomer LLC
La Place, Louisiana

Pollutant	Emission Standard	Regulatory Citation
Destruction and removal efficiency (DRE)	99.99%	40 CFR § 63.1218(c)(1)
Maximum combustion system pressure	Maintain below 0 in. (inch) water column	40 CFR § 63.1209(p)

To demonstrate compliance with the emission standards, DPE was required to conduct an initial comprehensive performance test (CPT) within 6 months after the compliance date of the regulation (commenced on May 12, 2010) **(Appendix W)**, and a subsequent CPT within 61 months of the commencing the previous CPT (commenced March 24, 2015) **(Appendix X)**. During CPTs, DPE is required to determine the minimum or maximum range of specific operating parameters that ensure compliance with the emission standards. These parameters must then be continuously monitored and recorded to ensure continuous compliance with the standards. Limits for carbon monoxide (below 100 ppm on an hourly rolling average [HRA]) and maintenance of combustion chamber pressure below 0 inch of water column (based on instantaneous measurement) can be directly measured and were, therefore, not required to be established during the CPTs. The HAPF is required to be operated with an automatic waste feed cutoff (AWFCO) that immediately and automatically cuts off waste feed when an operating parameter limit (OPL) or emission standard is exceeded. The OPLs established during the CPTs are as follows:

Table 7. OPERATING PARAMETER LIMITS
Denka Performance Elastomer LLC
La Place, Louisiana

Operating Parameter	Applicable Emission Standards	Limit (2010 CPT)	Limit (2015 CPT)	Averaging Period
Minimum combustion chamber temperature	HC, DRE	1,405 °C	1,405 °C	HRA
Maximum total combustion air flow rate	HC, DRE, HCl/Cl_2	440,840 standard cubic feet per hour (scfh)	445,000 scfh	HRA
Maximum total hazardous waste feed rate	HC, DRE	3,853 pounds per hour (lb/hr)	3,853 lb/hr	HRA
Minimum atomizing fluid flow rate	HC, DRE	4,000 scfh	4,000 scfh	Instantaneous
Maximum chlorine feed rate	HCl/Cl_2	2,030 lb/hr	1,752 lb/hr	HRA
Minimum DynaWave scrubber pressure drop	HCl/Cl_2	14 in. w.c.	9.0 in. w.c.	HRA
Minimum DynaWave scrubber liquid pH	HCl/Cl_2	2.1	2.1	HRA
Minimum DynaWave scrubber liquid to gas ratio	HCl/Cl_2	107 gal/ thousand	113 gal/Mscf	HRA

Table 7. OPERATING PARAMETER LIMITS
Denka Performance Elastomer LLC
La Place, Louisiana

Operating Parameter	Applicable Emission Standards	Limit (2010 CPT)	Limit (2015 CPT)	Averaging Period
		standard cubic feet (Mscf)		

NEIC received continuous parameter monitoring data on a minute-by-minute basis for the previous 3 years of HAPF operation, which includes data from January 1, 2013, to June 2, 2016. The data for each parameter was analyzed by calculating an HRA each minute (or instantaneous measurements for appropriate parameters) and comparing the result to the emission standard or OPL established during the relevant performance test. The emission standards only apply when hazardous waste is in the combustion chamber and are also not applicable during startup, shutdown, or malfunction (SSM). If an exceedance or excursion was observed in the data, the hazardous waste feed rate was observed to determine if hazardous waste was being fed into the combustion chamber at the time of the exceedance. Any observed exceedances were also compared against dates and times that were reported by DPE as SSM events in the required semiannual reports. Additionally, as described in 40 CFR § 63.1209, for intermittent operations, when data is missing or when the source is not operating (i.e., when hazardous waste is not being fed into the combustion chamber), the time periods must be ignored for the purposes of calculating rolling averages. When the HAPF began operating again or any missing data became available again, the first one-minute value was added to the previous 59 valid data values to calculate the HRA.

Emission Calculations

Title V permits for the chloroprene and neoprene process require annual emission calculations. DPE keeps emission calculations for the different process areas. NEIC requested copies of these emission calculations for the chloroprene and neoprene processes for calendar years 2013, 2014, and 2015 (**Appendices T, U, and V**). DPE performed emission calculations from the point in time when it purchased the facility (November 2015) through the end of 2015 (**Appendix V**). DuPont performed the emission calculations for 2013, 2014, and part of 2015 (January through October 31, 2015).

DPE used DuPont's emission estimation methodology for its emission reports. NEIC reviewed emission calculations for the following points: CD vent condenser, chloroprene fugitive emissions, neoprene poly kettles, neoprene strippers, neoprene dryers, and neoprene fugitive emissions.

On-Site Laboratory Evaluation

Part of the DPE neoprene area is an on-site laboratory used for performing various quality control checks of its product process steps. EPA personnel observed product quality sampling points in the polymerization unit and the plant analytical laboratory on June 8, 2016, and focused primarily on CD analysis. Inspection team members Richard Helmich and Sarah Frey were escorted by Dennis McCrea, Patrick Walsh, and Jack Hine to the on-site laboratory.

An initial discussion was held in the polymerization unit control room. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

In the laboratory, the laboratory manager provided a brief overview of the laboratory, and stated that the laboratory is ISO 9001 certified. Overall, the laboratory was well kept, and no immediate safety hazards were observed. All personnel were wearing proper attire and safety equipment. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Wastewater Sampling

On June 10, 2016, NEIC inspectors collected wastewater samples at select wastewater locations in the neoprene process. These are locations where wastewater drains into open trenches prior to treatment at the wastewater treatment plant. Neither DPE nor DuPont previously sampled these locations to determine chloroprene concentrations for compliance with the wastewater provisions in the Polymers and Resins I MACT. NEIC inspector Doreen Au collected grab samples into 40 mL volatile organic analysis (VOA) vials. Samples were placed on ice before they were shipped in locked coolers via UPS to the NEIC laboratory for analysis. Wastewater sample locations are shown in in **Figure 1**; sample results are provided in **Table 8**. The complete NEIC laboratory report can be found in **Appendix Y**. The analytical results for these grab samples indicate they are Group 2 wastewater streams. NEIC did not have enough sample jars to collect any additional samples; for example, NEIC did not evaluate the chloroprene content of the aqueous phase of the RCD decanter.

Table 8. NEIC CHLOROPRENE ANALYSIS SUMMARY
Denka Performance Elastomer LLC
La Place, Louisiana

Location Description	micrograms per liter (ug/L)	part per million by weight (ppm_w)
Stripper #1 Condenser	239,700	239.7
	205,200	205.2
	220,000	220.0
Centrifugal Separator Pot Receiver Flow	3,680	3.68
	4,500	4.5
	4,428	4.4

Table 8. NEIC CHLOROPRENE ANALYSIS SUMMARY
Denka Performance Elastomer LLC
La Place, Louisiana

Location Description	micrograms per liter (ug/L)	part per million by weight (ppm_w)
Stripper #3 Water Condenser	244,100	244.1
	319,000	319.0
	239,200	239.2
#1 Precondenser Runoff	86,400	86.4
	90,760	90.8
	93,420	93.4
	96,240	96.2
	95,750	95.8
#3 Precondenser Runoff	103,000	103.0
	110,500	110.5

[redacted]

[redacted]

[redacted]

SUMMARY OF FINDINGS

Observations made by NEIC during the DPE focused CAA investigation are summarized in the following table. These observations are linked to specific supporting documents that can be found in individual appendices to this table. These observations are categorized as areas of noncompliance (AON) and as areas of concern (AOC); areas of concern are inspection observations of problems or activities that could impact the environment or result in future or current noncompliance, and/or are areas associated with pollution prevention.

#	Regulatory Citation	Findings/Observations	Supporting Evidence
CLEAN AIR ACT			
POTENTIAL AREAS OF NONCOMPLIANCE			
40 CFR Part 63 Subpart G			
1	**40 CFR § 63.117(a)** *Each owner or operator subject to the control provisions for Group 1 process vents in §63.113(a) or the provisions for Group 2 process vents with a TRE index value greater than 1.0 but less than or equal to 4.0 in §63.113(d) shall: (1) Keep an up-to-date, readily accessible record of the data specified in paragraphs (a)(4) through (a)(8) of this section, as applicable...* (7) *Record and report the following when achieving and maintaining a TRE index value greater than 1.0 but less than 4.0 as specified in §63.113(a)(3) or §63.113(d) of this subpart. (i) The parameter monitoring results for absorbers, condensers, or carbon adsorbers, as specified in table 4 of this subpart, and averaged over the same time period of the measurements of the vent stream flow rate and concentration used in the TRE determination (both measured while the vent stream is normally routed and constituted)...* *Table 4 to Subpart G of Part 63 – Process Vents – Monitoring, Recordkeeping, and Reporting Requirements for Maintaining a TRE Index Value >1.0 and <= 4.0*	**Since November 1, 2015, DPE did not meet the monitoring, recordkeeping, and reporting requirements required by 40 CFR § 63.117(a)(7) for the CD vent condenser.** **From at least 1997 through October 31, 2015, DuPont did not did not meet the monitoring, recordkeeping and reporting requirements required by 40 CFR § 63.117(a)(7) for the CD vent condenser.** Both DuPont and DPE monitored the outlet temperature of the brine from the condenser rather than the outlet temperature of the product as required. No alternatives to this requirement were requested in the 1997 NOCS. Alternatives can be requested per 40 CFR § 63.152(e). NEIC requested DPE provide a copy of any alternative requests submitted for regulatory purposes. DPE did not provide any alternative requests submitted to the Administrator for this requirement. Although included in the Title V permit, the state does not have the approval to grant major alternatives to monitoring per 40 CFR § 63.153 (c), *The authorities that cannot be delegated to State, local, or Tribal agency are as specified in paragraphs (c)(1) through (4) of this section...* (3); *Approval of major alternatives to monitoring under §63.8(f), as defined in §64.90, and as required in this subpart* As referenced by Table 3 to Subpart F of Part 63 – General Provisions Applicability to Subparts F, G, and H to Subpart, per 40 CFR § 63.8(f), *Use of an alternative monitoring method (1) General. Until permission to use and alternative monitoring procedure (minor, intermediate, or major changes; see definition in §63.90(a)) has been granted by the Administrator under this paragraph (f)(1), the owner or operator of an affected source remains subject to the requirements of this section and the relevant standard.*	**Appendix D –** September 1997 HON Notification of Compliance Status **Appendix E –** Chloroprene and Neoprene Title V Permits

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td></td><td><table><tr><th>Final recovery device</th><th>Parameters to be monitored</th><th>Recordkeeping and reporting requirements for monitored parameters</th></tr><tr><td>Condenser</td><td>Exit (product side) temperature [63.114(b)(2)]</td><td>1. Continuous records.
2. Record and report the exit temperature averaged over the full period of the TRE determination – NCS.
3. Record the daily average exit temperature for each operating day.
4. Report all daily average exit temperatures that are outside the range established in the NCS or operating permit-PR.</td></tr></table></td><td>A major change to monitoring means, 40 CFR §63.90, means a modification to federally required monitoring that uses "unproven technology or procedures"... Examples of major changes to monitoring include, but are not limited to: (1) Use of a new monitoring approach developed to apply to a control technology not contemplated in the applicable regulation.

Monitoring the outlet temperature of the brine rather than monitoring the exit temperature of the product is a new monitoring approach that was not contemplated in the applicable regulation.</td><td></td></tr>
<tr><td colspan="4">40 CFR Part 63 Subpart H</td></tr>
<tr><td>2</td><td>40 CFR § 63.162 Standards: General... (c) Each piece of equipment in a process unit to which this subpart applies shall be identified such that it can be distinguished readily from equipment that is not subject to this subpart.</td><td>Approximately 10,000 regulated components were not identified or monitored prior to DPE's purchase of the facility from DuPont.

NEIC received copies of DPE's LeakDAS® data tables for February 2013–December 2015 (archived) and November 2014–June 2016 (current), and reviewed the information for DPE's compliance with 40 CFR Part 63 Subpart H requirements. A transition to a new tagging system of components in the LDAR program occurred during the overlapped time of the archived and current databases.

Component inventories were tabulated for active components in each set of data tables. Comparison of active component inventories between the archived and current data tables</td><td></td></tr>
</table>

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		shows active component inventories of 21,659 (archived) and 32.501 (current), which is an increase of 10,842 active components in the current data tables. DPE representatives Patrick Walsh and Doug Melancon both stated during two separate interviews that, within the last several years, they discovered approximately 10,000 regulated components that had never been identified or monitored. Neither DuPont nor DPE self-disclosed this compliance issue to LDEQ or EPA.	
3	**40 CFR § 63.168 Standards: Valves in gas/vapor service and in light liquid service... (f)(1)** *When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected.*	**DPE failed to repair, or place on delay of repair, one leaking valve within 15 in-service calendar days.** Based on information in the facility's LDAR recordkeeping database, DPE failed to perform final repairs to one valve or to place the component on the delay-of-repair list, within 15 days of identification of the leak, between February 2013 and June 2016.	**Appendix L** – Late Final Repair Attempt Component Data
4	**40 CFR § 63.168 Standards: Valves in gas/vapor service and in light liquid service... (f)(2).** *A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.*	**DPE failed to complete a first attempt at repair of one leaking valve within 5 in-service calendar days.** Based on information in the facility's LDAR recordkeeping database, DPE failed to perform a first attempt at repair of one valve within the required timeframe, between February 2013 and June 2016.	**Appendix M** – Late First Attempt at Repair Component Data
5	**40 CFR § 63.167 Standards: Open-ended valves or lines.** **(a) (1)** *Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in § 63.162(b) of this subpart and paragraphs (d) and (e) of this section...* **(e)** *Open-ended valves or lines containing materials which would autocatalytically polymerize or, would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system as specified in paragraphs (a) through (c) of this section are exempt from the requirements of paragraph (a) through (c) of this section.*	**DPE does not equip each open-ended valve or line with a cap, blind flange, plug, or a second closed valve.** DPE representatives stated that the fluid in the process lines would autocatalytically polymerize and, therefore, they are exempt from the requirements of 40 CFR § 63.167(a)(1). DPE has not provided EPA with any documentation showing which chemicals in which specific lines meet the exemption. NEIC inspectors observed throughout the plant open-ended lines on piping that was labeled as containing toluene. NEIC inspectors also observed some plugs, second closed valves, and blind flanges on a few open-ended lines, but many other open-ended lines in the same chemical service without them. A majority of the valve leaks (fugitive emissions) were observed to be coming from the uncapped open-ended lines. NEIC inspectors identified a total of 31 valve leaks, of which 16 were observed to be coming from the uncapped open-ended line.	Field observations/notes
40 CFR Part 63 Subpart U			
6	**40 CFR § 63.488(a)...(2)** *The annual uncontrolled organic HAP or TOC emissions and annual average batch vent flow rate shall be determined at the exit from the batch unit operation. For the purposes of*	**DPE did not determine the group status of the batch poly kettles at the appropriate location.**	**Appendix C** – Neoprene Process Diagram

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	these determinations, the primary condenser operating as a reflux condenser on a reactor...shall be considered part of the batch unit operation. All other devices that recover or oxidize organic HAP or TOC vapors shall be considered control devices as defined in §63.482.	[redacted] [redacted] This common condenser does not reflux any material back to any kettle and, therefore, is not part of the batch unit. The appropriate location to determine the group status for each poly kettle is prior to the shared condenser.	**Appendix R** – 2008 Polymers and Resins I Compliance Manual
7	**40 CFR § 63.482 Front-end** *refers to the unit operations in an EPPU prior to, and including, the stripping operations. For all gas-phased reaction processes, all unit operations are considered to be front-end.* **40 CFR § 63.482 Group 1 batch front-end** process vent *means a batch front-end process vent releasing annual organic HAP emissions greater than or equal to 11,800 kg/yr and with a cutoff flow rate, calculated in accordance with §63.488(f) greater than or equal to the annual average batch flow rate. Annual organic HAP emissions and annual average batch vent flow rate are determined at the exit of the batch unit operation, as described in §63.488(a)(2). Annual organic HAP emissions are determined as specified in §63.488(b), and annual average batch vent flow rate is determined as specified in §63.488(e).* **40 CFR § 63.482** Aggregate batch vent stream *means a gaseous emission stream containing only the exhausts from two or more batch front-end process vents that are ducted, hard-piped, or otherwise connected together for a continuous flow.*	**The five batch poly kettles at DPE have Group 1 front-end batch process vent streams based on data provided by DPE, not Group 2 as previously determined, when performing the group determination at the appropriate location.** [redacted] The calculation in the 2009 Polymer and Resin I compliance manual (p. 25), indicates that the highest chloroprene-emitting process step occurs during the emulsification of the reactants. Chloroprene is also released during other process steps. The chloroprene inlet rate into the condensing system was calculated as 0.113446 pounds chloroprene per cubic foot (ft^3) of total vapor (p. 26). The average displacement charging rate was 32.4 ft^3/minute (min) (p. 26). The length of emulsification was identified as 31.6 minutes (p. 25). **For each charge in the emulsification step, the total mass of chloroprene into the condenser was:** 0.1133446 lbs CD/ft^3 * 32.4 ft^3/min* 31.6 minutes = 116 pounds per charge (52.6 kg/charge). To exceed the 26,000-pound-per-year threshold to become a Group 1 batch front-end process vent, each poly kettle would have to be charged:	**Appendix R** – 2008 Polymers and Resins I Compliance Manual **Appendix V** – 2015 Emission Calculations

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	40 CFR § 63.487...(b) Aggregate batch vent streams. *The owner or operator of an aggregate batch vent stream that contains one or more Group 1 batch front-end process vents shall comply with the requirements of either paragraph (b)(1) or (b)(2) of this section. Compliance may be based on either organic HAP or TOC* *(2) For each aggregate batch vent stream, reduce organic HAP emissions by 90 weight percent or to a concentration of 20, ppmv, whichever is less stringent, on a continuous basis using a control device.* **40 CFR § 63.490...(e) Aggregate batch front-end process vent testing and procedures for compliance with 63.487(b)(2).** *Except as specified in paragraphs e(1) through e(3) of this section, owner or operators of aggregate batch vent streams complying with §63.487(b)(2) shall conduct a performance test using the performance testing procedures for continuous front-end process vents in §63.116(c).* **40 CFR § 63.489...(b) Batch front-end process vent and aggregate batch vent stream monitoring equipment**...*(6) Where a condenser is used, a condenser exit temperature (product side) monitoring device equipped with a continuous recorder is required.* **(e) Establishment of parameter monitoring levels.** *Parameter monitoring levels for batch front-end process vents and aggregate batch vent streams shall be established as specified in paragraphs (e)(1) through (e)(3) of this section. (1)For each parameter monitored under paragraph (b) or (c) of this section a level, defined as either a maximum or minimum operating parameter as denoted in Table 7 of this subpart, that indicates proper operation of the control device. The level shall be established in accordance with the procedures specified in §63.505...*	26,000 pounds/year ÷ 116 pounds CD/charge = **225 charges**. **Using an average displacement rate of 22.40 ft^3/min (without nitrogen) instead of the average displacement charging rate of 32.4 ft^3/min:** 0.1133446 lbs CD/ft^3 * 22.4 ft^3/min * 31.6 min = 80.2 lbs CD/charge (36.4 kg/charge) 26,000 pounds/year ÷ 80.2 pounds CD/charge **= 325 charges** According to DuPont's calculations (in 2001), at the permitted production capacity of 90 MM pounds of neoprene, it would produce 5,634 charges per year. 1,127 charges for each kettle with a typical mixture of 676 charges of W-type neoprene and 451 charges of A-type neoprene. DPE also provided data showing that the facility manufactured 70,940,758 pounds of neoprene in 2015. From 2015 emission inventory calculations, the total charges of all types in 2015 (Jan--Oct = 3709, Nov–Dec =672) = total 4381 charges/five reactors = **876 charges per reactor.** 876 charges per reactor is greater than either the 225 charges or 325 charges; the minimum amount of charge for each kettle to exceed the 26,000-pound-per-year threshold to be considered a Group 1 batch process vent using either displacement rate. **An estimate of the cutoff flow rate (CFR) using equation 15 in 40 CFR § 63.488(f):** CFR = (0.00437)*(AE) – 51.6 AE = annual emissions (at exit of batch operation) **Using emissions from 32.4 ft^3/min charging rate:** CFR = 0.00437*876 charges (52.6 kg/charge) – 51.6 CFR = 149 standard cubic meters per minute (scmm)	

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	40 CFR § 63.505...(a) Establishment of parameter monitoring levels. *The owner or operator of a control or recovery device that has one or more parameter monitoring level requirements specified under this subpart shall establish a maximum or minimum level for each measured parameter. If a performance test is required by this subpart for a control device, the owner or operator shall use the procedures in either paragraph (b) or (c) of this section to establish the parameter monitoring level(s)....*	Using as an estimate for the annual average emission flow rate at the exit of the vessel (average displacement charging rate of 32.4 ft^3/min [from emulsification step which lasts the longest]) (No measurement data is available): 32.4 ft^3/min * 0.0283 m^3/ft^3 = 0.92 m^3/min (scmm) 149 scmm > 0.92 scmm The cutoff flow rate is greater than the annual average batch flow rate. **Using emissions from 22.4 ft^3/min charging rate:** CFR = 0.00437*876 charges (36.4 kg/charge) CFR = 139 standard cubic meters per minute (scmm) Using as an estimate for the annual average emission flow rate at the exit of the vessel (average displacement charging rate of 22.4 ft^3/min [from emulsification step which lasts the longest]) (No measurement data is available): 22.4 ft^3/min * 0.0283 m^3/ft^3 = 0.63 m^3/min (scmm) 139 scmm > 0.63 scmm The cutoff flow rate is greater than the annual average batch flow rate. Using either displacement rate listed by DuPont, each poly kettle emits greater than 26,000 pounds (11,800 kilograms [kg]) a year and has a cutoff flow rate greater than the annual average batch flow rate, the kettles meet the definition of a Group 1 batch front-end process vent. This is a conservative estimate only using emissions from the emulsification step of the batch. Since the combination of all the poly kettle vents create an aggregate batch vent, DPE should have conducted a performance test, established parameter monitoring levels for the condenser, and continuously monitored the minimum temperature for the condenser. Neither DPE nor DuPont conducted a performance test on the condenser to determine compliance with 40 CFR § 63.487(b) since the process was changed in the 2005/2006 timeframe. Because no performance test was conducted, no parametric monitoring	

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		conditions were established and no continuous monitoring was conducted or evaluated against this condition.	
8	**40 CFR § 63.482** Front-end *refers to the unit operations in an EPPU prior to, and including, the stripping operations. For all gas-phased reaction processes, all unit operations are considered to be front-end.* **40 CFR § 63.482** Stripping *means the removal of organic compounds from a raw elastomer product. In the production of an elastomer, stripping is a discrete step that occurs after the reactors and before the dryers (other than those dryers with a primary purpose of devolitalization) and other finishing operations. Examples of types of stripping include steam stripping, direct volatilization, chemical stripping, and other methods of devolatilization. For the purposes of this subpart, devolatilization that occurs in dryers (other than those dryers with a primary purpose of devolitalization), extruders, and other finishing operations is not stripping.* **40 CFR § 63.482** Group 1 batch front-end process vent *means a batch front-end process vent releasing annual organic HAP emissions granter than or equal to 11,800 kg/yr and with a cutoff flow rate, calculated in accordance with §63.488(f) greater than or equal to the annual average batch flow rate. Annual organic HAP emissions and annual average batch vent flow rate are determined at the exit of the batch unit operation, as described in §63.488(a)(2). Annual organic HAP emissions are determined as specified in §63.488(b), and annual average batch vent flow rate is determined as specified in §63.488(e).* **40 CFR § 63.482** Group 1 continuous front-end process vents *means a continuous front-end process vent for which the flow rate is greater than or equal to 0.005 standard cubic feet per minute, the total organic HAP concentration is greater than or equal to 50 parts per million by volume, and the total resource*	**DPE has not evaluated the vent stream from the second-stage separators associated with each flash cooler to determine group status.** Devolatilization occurs at the flash coolers and associated separators. The flash coolers act as a wide spot in the line where the pressure is lowered and any additional unreacted chloroprene is volatilized. This operation is part of the stripping operations, and any vent streams from this process should be evaluated.	**Appendix F** – November 2001 Polymers and Resins I Notification of Compliance Status **Appendix R** – Polymers and Resins I Compliance Manual **Appendix C** – Neoprene Process Diagram

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	effectiveness index value, calculated according to §63.115, is less than or equal to 1.0		
9	**40 CFR § 63.494 Back-end process provisions–residual organic HAP and emission limitations** **(a)(4) (iii)** *For neoprene, the organic HAP emission limitation, in units of Mg organic HAP emissions per Mg of neoprene produced, shall be calculated by dividing 30 Mg/yr by the mass of neoprene produced in 2007, in Mg.* **40 CFR § 63.498 Back-end process provisions–recordkeeping (a)** *Each owner or operator shall maintain the records specified in paragraphs (a)(1) through (4), and paragraphs (b) through (e) of this section, as appropriate...* **(e)** *If the back-end process operation is subject to an organic HAP emission limitation in §63.494(a)(4), the records specified in paragraphs (e)(1) through (4) of this section.* *(1) The applicable organic HAP emission limitation determined in accordance with §63.494(a)(4)(i) through (iv).* *(2) The organic HAP emissions from all back-end process operations for each month, along with documentation of all calculations and other information used in the engineering assessment to estimate these emissions.* *(3) The mass of elastomer product produced each month.* *(4) The total mass of organic HAP emitted for each 12-month period divided by the total mass of elastomer produced during the 12-month period, determined in accordance with §63.495(g)(5).*	**DPE does not have records supporting why emission factors from the 1990s at other DuPont facilities are relevant to the content of chloroprene in stripped neoprene from its facility.** To determine compliance with the back-end limit in 2015, DPE uses its production rate and emission factors for residual chloroprene and toluene for different neoprene types. Emission factors for types 1–9 were from samples collected at the Pontchartrain site in 1996, and types 10–15 were from samples collected at the Louisville site in 1992. DPE cannot explain how these factors are relevant to emissions from its La Place facility. The La Place facility changed its polymer stripping operations in 2005/2006, yet DuPont and DPE continue to use these outdated emission factors for 15 of the types of neoprene made on-site. DPE has analytical results for residual HAP in liquid dispersion products because they are sampled in every lot, per customer demand. However, in its emission calculations, DPE continues to use different emission factors, between 0.02 to 0.03 percent chloroprene, instead of the analytical averages of 0.009 to 0.049 percent. DPE did not provide NEIC information on the source of the emission factors for the liquid dispersion products. Without current and accurate residual chloroprene content for the neoprene made on-site using the current plant set-up, there is no data to confirm DPE's compliance with back-end emission limitations in the La Place facility.	**Appendix S** – 2015 Emission Factors for Neoprene Products **Appendices T, U, and V** – 2013, 2014, and 2015 Neoprene Emission Calculations

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr>
<td>10</td>
<td>40 CFR § 63.484 Storage vessel provisions.

(a) This section applies to each storage vessel that is assigned to an affected source, as determined by §63.480(g). Except for those storage vessels exempted by paragraph (b) of this section, the owner or operator of affected sources shall comply with the requirements of §§63.119 through 63.123 and 63.148, with the differences noted in paragraphs (c) through (s) of this section, for the purposes of this subpart.

(d) When the term "Group 1 storage vessel" is used in §§63.119 through 63.123, the definition of this term in §63.482 shall apply for the purposes of this subpart.

40 CFR § 63.482 Group 1 storage vessel means a storage vessel at an existing affected source that meets the applicability criteria specified in Table 3 of this subpart, or a storage vessel at a new affected source that meets the applicability criteria specified in Table 4 of this subpart.

Table 3 to Subpart U of Part 63–Group 1 Storage Vessels at Existing Affected Sources

<table>
<tr><th>Vessel capacity (cubic meters)</th><th>Vapor pressure[a] (kilopascals)</th></tr>
<tr><td>75 ≤capacity <151</td><td>≥13.1</td></tr>
<tr><td>151 ≤capacity</td><td>≥5.2</td></tr>
</table>

[a] Maximum true vapor pressure of total organic HAP at storage temperature.</td>
<td>DPE's crude chloroprene storage tank 1 (emission point 1700-21.1 (1700-63)) is a Group 1 storage tank based on the temperature of the vapor provided in the 2013 neoprene emission inventory calculations, and it requires additional controls.

DPE relies on DuPont's storage vessel regulatory determinations. In the November 2001 notification of compliance status, crude storage tank 1 is identified as having a capacity of 50,000 gallons (189.3 cubic meters) with a vapor pressure of 0.7 psi (4.83 kPa).

This tank is not listed as a storage vessel in the 2008 polymers and resins compliance manual.

However, this tank is listed as a source to the common header 1700-63 in the 2013 neoprene emission inventory calculations. The 2013 emission inventory calculation states that the temperature of the vapor is 5 °C (41 °F). The calculated vapor pressure using the Antoine equation for 41 °F is 1.62 psi (11.17 kPa). This tank does not appear in the 2014 or 2015 emission inventory calculations.

Based on the size of the crude storage tank, 1,189.3 cubic meters with a vapor pressure of 11.17 kPa, the tank is a Group 1 storage tank that requires additional controls.</td>
<td>Appendix Z – Chloroprene Vapor Pressure Curve

Appendix F – November 2001 Polymers and Resins 1 Notification of Compliance Status

Appendix R – 2008 Polymers and Resins 1 Compliance Manual

Appendices T, U, and V – 2013, 2014, and 2015 Neoprene Emission Calculations</td>
</tr>
<tr>
<td>11</td>
<td>40 CFR § 63.502 Equipment leak and heat exchange system provisions.

(a) Equipment leak provisions. The owner or operator of each affected source, shall comply with the requirements of subpart H of this part, ... Surge control vessels required to be controlled by subpart H</td>
<td>DPE is routing vent streams from a surge control vessel to uncontrolled storage tanks that vent to the atmosphere.

In the polymers and resins I compliance manual, DuPont identified that that vent stream from the surge vessel, refined CD tank, associated with the CD refining column, either would be required to route back to the process through a closed vent system, or to route to a control device, or to comply with floating roof control requirements. DuPont chose to</td>
<td>Appendix F – November 2001 Polymers and Resins I Notification of Compliance Status</td>
</tr>
</table>

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	may, alternatively, comply with the Group 1 storage vessel provisions specified in §63.484. **40 CFR § 63.170 Standards: Surge control vessels and bottoms receivers.** *Each surge control vessel or bottoms receiver that is not routed back to the process and that meets the conditions specified in table 2 or table 3 of this subpart shall be equipped with a closed-vent system that routes the organic vapors vented from the surge control vessel or bottoms receiver back to the process or to a control device that complies with the requirements in §63.172 of this subpart, except as provided in §63.162(b) of this subpart, or comply with the requirements of §63.119(b) or (c) of subpart G of this part.*	route the refined CD tank vent stream back to the process via the uncontrolled crude CD tanks, which then vent to the atmosphere. In the polymers and resins compliance manual, DuPont stated that this is routing the vent stream back to the process, because instead of using nitrogen to vapor-balance the crude CD tanks, the refined CD vapors would provide the vapor balance and no additional emissions of chloroprene would be released from the crude CD tanks. No engineering calculations, modeling, or testing were included to support these statements.	**Appendix R –** 2008 Polymers and Resins 1 Compliance Manual
40 CFR Part 63 Subpart EEE			
12	**40 CFR § 63.1218...(a) Emission limits for existing sources.** *You must not discharge or cause combustion gases to be emitted to the atmosphere that contain:* (1) *For dioxins and furans, either carbon monoxide or hydrocarbon emissions in excess of the limits provided by paragraph (a)(5) of this section:...* (5) *For carbon monoxide and hydrocarbons, either:* (i) *Carbon monoxide in excess of 100 parts per million by volume, over an hourly rolling average...* **40 CFR § 63.1209...(k) Dioxins and furans.** *You must comply with the dioxin and furans emission standard by establishing and complying with the following operating parameter limits...* **(2) Minimum combustion chamber temperature.** (i) *For sources other than cement kilns, you must measure the temperature of each combustion chamber...*	**While operating the HAPF, DuPont and DPE failed to meet the emission standards for dioxins and furans and carbon monoxide.** As described previously in "On-site Inspection Summary," NEIC evaluated continuous monitoring data from the operation of the HAPF. Compliance with the CO emission limit of 100 ppm on an hourly rolling average is one requirement for compliance with the emission standards for dioxins and furans. Conversely, DuPont's failure to operate the HAPF in compliance with the CO emission limit also constitutes failure to meet the dioxin and furan emission standards. Additionally, surrogate parameters (OPLs) established during the CPTs that must be monitored to ensure compliance with the dioxin and furan emission limit are minimum combustion chamber temperature, maximum flue gas flow rate, and maximum hazardous waste feedrate. DPE failed to meet the OPLs listed below. DPE acquired the facility from DuPont in November 2015. **Carbon monoxide** DPE maintains four distinct CO monitors on the HAPF stack. In its evaluation, NEIC only included CO exceedances that showed greater than 100 ppm from all four monitors during the same time period. Prior to DPE's acquisition of the facility, DuPont emitted gases	**Appendix AA –** Carbon Monoxide Analysis **Appendix BB –** Parameter Exceedances Data Analysis **Appendix CC –** Hazardous Waste Combustor Periodic Reports **Appendix W –** 2010 Hazardous Waste Comprehensive Performance Test **Appendix X –** 2015 Hazardous Waste

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr>
<td></td>
<td>
(ii) You must establish a minimum hourly rolling average limit...
(3) Maximum flue gas flowrate or production rate. (i) As an indicator of gas residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate...
(ii) You must comply with this limit on a hourly rolling average basis;
(4) Maximum hazardous waste feedrate. (i) You must establish limits on the maximum... hazardous waste feedrate for each location where waste is fed...
(iii) You must comply with the feedrate limit(s) on a hourly rolling average basis;
</td>
<td>
containing greater than 100 ppm CO while hazardous waste was being fed into one of the combustion chambers for the following number of hourly rolling averages:
Number of HRA exceedances for CO by semiannual period
<table>
<tr><td>1/1/13 – 6/30/13</td><td>13</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>0</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>39</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>110</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>743</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>0</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>0</td></tr>
<tr><td>Total</td><td>905</td></tr>
</table>
Minimum combustion chamber temperature 1,405 °C
DPE continuously measures the combustion chamber temperature independently for each of the two combustion chambers. The following number of HRA temperature exceedances were observed while hazardous waste was being fed into the corresponding combustion chamber:
Number of HRA exceedances for combustion chamber temperature by semiannual period
<table>
<tr><th>Semiannual period</th><th>Combustion Chamber 1</th><th>Combustion Chamber 2</th></tr>
<tr><td>1/1/13 – 6/30/13</td><td>0</td><td>12,325</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>3,492</td><td>46,771</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>58,480</td><td>10,514</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>63,152</td><td>12,502</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>60,488</td><td>39,532</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>47,651</td><td>2,407</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>10,012</td><td>24,231</td></tr>
<tr><td>Total</td><td>243,275</td><td>148,282</td></tr>
</table>
Maximum flue gas flow rate 440,840 scfh (2010 CPT)/445,000 scfh (2015 CPT)
DPE continuously monitors the combustion air flow rate in each of the combustion chambers and then adds them together to calculate the total flue gas flow rate. The
</td>
<td>Comprehensive Performance Test</td>
</tr>
</table>

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td></td><td></td><td>following number of HRA flue gas flow rate exceedances were observed while hazardous waste was being fed into either of the combustion chambers:

Number of HRA exceedances for flue gas flowrate by semiannual period

<table><tr><td>1/1/13 – 6/30/13</td><td>0</td></tr><tr><td>7/1/13 – 12/31/13</td><td>0</td></tr><tr><td>1/1/14 – 6/30/14</td><td>0</td></tr><tr><td>7/1/14 – 12/31/14</td><td>0</td></tr><tr><td>1/1/15 – 6/30/15</td><td>633</td></tr><tr><td>7/1/15 – 12/31/15</td><td>0</td></tr><tr><td>1/1/16 – 6/30/16</td><td>0</td></tr><tr><td>Total</td><td>633</td></tr></table>
No exceedances of the hazardous waste feed rate were observed for either combustion chamber during the three years analyzed by NEIC.</td><td></td></tr>
<tr><td>13</td><td>40 CFR § 63.1218...(c) Destruction and removal efficiency (DRE) standard – (1) 99.99% DRE...
40 CFR § 1209(j) DRE. To remain in compliance with the (DRE) standard, you must establish operating limits...for the following parameters...and comply with those limits at all times that hazardous waste remains in the combustion chamber...
(1) Minimum combustion chamber temperature.
(i) You must measure the temperature of each combustion chamber...
(ii) You must establish a minimum hourly rolling average limit...
(2) Maximum flue gas flowrate or production rate.
(i) As an indicator of residence time in the control device, you must establish and comply with a limit on the maximum flue gas flowrate...
(ii) You must comply with this limit on an hourly rolling average basis;
(3) Maximum hazardous waste feedrate.
(i) You must establish limits on the maximum... hazardous waste feedrate for each location where hazardous waste is fed.
(iii) You must comply with the feedrate limits on an hourly rolling average basis;</td><td>DuPont and DPE failed to maintain a DRE above 99.99% at all times hazardous waste was being fed into the combustion chambers.

Some of the parameters (minimum combustion chamber temperature and minimum flue gas flow rate) that are established to maintain continuous compliance with the DRE standard are the same parameters monitored to ensure compliance with the dioxins and furans emission standard. See AON 12 for the number of exceedances for each of those parameters.

DPE acquired the facility from DuPont in November 2015.

Operation of waste firing system

DPE has established a minimum atomization flowrate of 4,000 standard cubic feet per hour (scfh) on an instantaneous basis to show proper operation of the waste firing system. The number of exceedances due to failure to maintain the minimum atomization flow rate while hazardous waste was being fed into the combustion chamber are tabulated below:</td><td>Appendix BB – Parameter Exceedances Data Analysis

Appendix CC – Hazardous Waste Combustor Periodic Reports

Appendix W – 2010 Hazardous Waste Comprehensive Performance Test

Appendix X – 2015 Hazardous Waste Comprehensive Performance Test</td></tr>
</table>

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td></td><td>(4) Operation of waste firing system. You must specify operating parameters and limits to ensure that good operation of each hazardous waste firing system is maintained.</td><td>Number of instantaneous (1-minute) atomization flow rate exceedances by semiannual period
<table>
<tr><th>Semiannual Period</th><th>Combustion Chamber 1</th><th>Combustion Chamber 2</th></tr>
<tr><td>1/1/13 – 6/30/13</td><td>25</td><td>127,686</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>83</td><td>46,683</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>671</td><td>10,738</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>137</td><td>11,076</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>535</td><td>36,765</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>449</td><td>2,998</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>274</td><td>25,904</td></tr>
<tr><td>Total</td><td>2,174</td><td>261,850</td></tr>
</table></td><td></td></tr>
<tr><td>14</td><td>40 CFR § 63.1218…(a) Emission limits for existing sources. You must not discharge or cause combustion gases to be emitted to the atmosphere that contain:

(6) For hydrogen chloride and chlorine gas…

(i) Emission in excess of 150 parts per million by volume…

40 CFR § 1209…(o) Hydrogen chloride and chlorine gas. You must comply with the hydrogen chloride and chlorine gas emission standard by establishing and complying with the following operating parameter limits…
(1) Feedrate of total chlorine and chloride…
(2) Maximum flue gas flowrate or production rate…
(3) Wet Scrubber. If your combustor is equipped with a wet scrubber:
(i) If your source is equipped with a high energy wet scrubber…you must establish a limit on minimum pressure drop across the wet scrubber on an hourly rolling average…

(iv) You must establish a limit on minimum pH on an hourly rolling average…

(v) You must establish limits on either the minimum liquid to gas ratio or the minimum</td><td>DuPont and DPE failed to comply with the emission standards for hydrogen chloride and chlorine gas at all times hazardous waste was being fed into the combustion chambers.

The maximum flue gas flow rate requirement is an overlapping requirement for both the DRE and dioxin and furan emission standards. See AON 12 for the exceedances related to the maximum flue gas flow rate.

DPE operates a DynaWave scrubber as the final control device for hydrogen chloride and chlorine gas. DPE acquired the facility from DuPont in November 2015.

The following exceedances for each scrubber parameter were observed while hazardous waste was being fed into one of the combustion chambers:

Number of HRA exceedances for minimum scrubber pressure drop (14 in water column 2010 CPT/9 in. water column (2015 CPT) by semiannual period
<table>
<tr><td>1/1/13 – 6/30/13</td><td>302</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>4,720</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>16,116</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>2,852</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>1,757</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>469</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>7,199</td></tr>
<tr><td>Total</td><td>33,415</td></tr>
</table></td><td>Appendix BB – Parameter Exceedances Data Analysis

Appendix CC – Hazardous Waste Combustor Periodic Reports

Appendix W – 2010 Hazardous Waste Comprehensive Performance Test

Appendix X – 2015 Hazardous Waste Comprehensive Performance Test</td></tr>
</table>

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td></td><td>scrubber water flowrate and maximum flue gas flowrate on an hourly rolling average...</td><td>
Number of HRA exceedances for minimum pH (2.1) by semiannual period
<table>
<tr><td>1/1/13 – 6/30/13</td><td>19</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>530</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>6,146</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>0</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>157</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>0</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>0</td></tr>
<tr><td>Total</td><td>6,852</td></tr>
</table>
Number of HRA exceedances for minimum liquid to gas ratio (107 gal/thousand standard cubic feet (mscf) 2010 CPT/113 gal mscf 2015 CPT) by semiannual period
<table>
<tr><td>1/1/13 – 6/30/13</td><td>319</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>4,245</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>14,707</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>1,772</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>850</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>348</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>6,848</td></tr>
<tr><td>Total</td><td>29,089</td></tr>
</table>
No exceedances of the chlorine and chloride feed rates were observed during the three years analyzed by NEIC.
</td><td></td></tr>
<tr><td>15</td><td>40 CFR § 1206...(c) Operating requirements...(5) Combustion system leaks. (i) Combustion system leaks of hazardous air pollutants must be controlled by:

(B)Maintaining the maximum combustion zone pressure lower than ambient pressure using an instantaneous monitor...

40 CFR § 63.1209(p) Maximum combustion chamber pressure. If you comply with the requirements for combustion system leaks under §1206(c)(5) by maintaining the maximum combustion chamber pressure lower than ambient pressure to</td><td>While operating the HAPF, DuPont and DPE failed to maintain the combustion chambers under negative pressure while hazardous waste was being fed into the combustion chambers.

As described previously in "On-site Inspection Summary," NEIC evaluated continuous monitoring data from the operation of the HAPF. DPE continuously monitors the combustion chamber pressure, which must be maintained below ambient pressure at all times. Rather than a rolling average, the instantaneous value must be used to trigger the automatic waste feed cutoff. DPE acquired the facility from DuPont in November 2015.

The following number of pressure exceedances were observed while hazardous waste was being fed into the combustion chambers:</td><td>Appendix BB – Parameter Exceedances Data Analysis

Appendix CC – Hazardous Waste Combustor Periodic Reports</td></tr>
</table>

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td></td><td>prevent combustion systems leaks from hazardous waste combustion, you must perform instantaneous monitoring of pressure and the automatic waste feed cutoff system must be engaged when negative pressure is not adequately maintained.</td><td>Number of instantaneous (1-minute) pressure exceedances by semiannual period
<table>
<tr><th>Semiannual period</th><th>Combustion Chamber 1</th><th>Combustion Chamber 2</th></tr>
<tr><td>1/1/13 – 6/30/13</td><td>2</td><td>291</td></tr>
<tr><td>7/1/13 – 12/31/13</td><td>0</td><td>43,217</td></tr>
<tr><td>1/1/14 – 6/30/14</td><td>17,303</td><td>5,546</td></tr>
<tr><td>7/1/14 – 12/31/14</td><td>9,225</td><td>1,329</td></tr>
<tr><td>1/1/15 – 6/30/15</td><td>30,198</td><td>20,085</td></tr>
<tr><td>7/1/15 – 12/31/15</td><td>36,408</td><td>5</td></tr>
<tr><td>1/1/16 – 6/30/16</td><td>5,883</td><td>945</td></tr>
<tr><td>Total</td><td>99,019</td><td>71,418</td></tr>
</table></td><td></td></tr>
<tr><td>16</td><td>40 CFR § 1206…(c) Operating Requirements…(3) Automatic waste feed cutoff (AWFCO)-(i) General. Upon the compliance date, you must operate the hazardous waste combustor with a functioning system that immediately and automatically cuts off the hazardous waste feed…

(A) When any of the following are exceeded: Operating parameter limits…; an emission standard monitored by a CEMS; and the allowable combustion chamber pressure;

(B) When the span value of any CMS detector, except a CEMS, is met or exceeded;

(C) Upon malfunction of a CMS monitoring an operating parameter limit specified under § 63.1209 or an emission level; or

(D) When any component of the automatic waste feed cutoff system fails.</td><td>DuPont and DPE have failed to operate a functioning AWFCO that immediately and automatically cuts off the hazardous waste feed when exceedances occur.

As discussed in the AONs 12–15, there are many thousands of instances when monitored parameters or pollutants directly monitored were above or below the established limits. These exceedances are only listed in this report if hazardous waste was being fed into the combustion chamber at the time of the exceedance. Therefore, the AWFCO failed to cut off the hazardous waste feed when the exceedances occurred.</td><td>Appendix BB – Parameter Exceedances Data Analysis</td></tr>
<tr><td colspan="4">Title V Permits</td></tr>
<tr><td>17</td><td>Neoprene Title V Permit 2249-V8

UNF0001 Neoprene Unit

Condition 260 [LAC 33:III.919] Submit Emission Inventory (EI)/Annual Emission Statement. Due</td><td>DPE used improper emission factors to calculate emissions of chloroprene for 2015, and DuPont used improper emission factors for 2013–2015.

Poly kettle emissions: The 2013 emission inventory spreadsheet provided by DPE has a tab entitled "Kettles New"; this tab references toluene emissions from sampling data from tests performed on March 14, 2002, and March 18, 2002. In 2002, each poly kettle had its own individual condenser. [redacted]</td><td>Appendix E – Chloroprene and Neoprene Title V Permits

Appendices T, U, and V – 2013,</td></tr>
</table>

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	annually, by the 30th of April for the period January 1 to December 31 of the previous year unless otherwise directed... **Condition 249 [LAC 33:III:5107.A]** *Submit Annual Emissions Report (TEDI): Due annually, by the 31st of March unless otherwise directed by DEQ, to the Office of Environmental Assessment in a format specified by DEQ. Identify the quantity of emissions in the previous calendar year for any toxic air pollutant listed in Table 51.1 or 51.3.* **Condition 248 [LAC 33:III.5107.A.2]** *Include a certification statement with the annual emission report and revisions to any emission report that attest that the information contained in the emission report is true, accurate, and complete, and that is signed by a responsible official, as defined in LAC 33:III.502. Include the full name of the responsible official, title, signature, date of signature, and phone number of the responsible official.*	shared condenser. Using sampling data from March 2002 does not reflect current emissions. Chloroprene emissions for the poly kettles are improperly calculated. The spreadsheets state that the basis for the calculations is that all of the nitrogen flowing through the new condenser will saturate with chloroprene. In the spreadsheets, in the "Kettles New" tab, it is also stated that the condenser exit temperature is 2 °C. The Title V permit requirement is to ensure the brine temperature is below 5 degrees Centigrade (Condition 192), which would indicate that the exit condenser temperature consistently operates lower than the required brine temperature. These estimates do not account for the actual operating conditions required by the permit. **Stripper emissions:** In the spreadsheets, in the "Strippers" tab, it is stated that a new condenser was installed in 2006 to service the three strippers; however, nitrogen flow is based on sampling data from tests performed on March 13, 2002, and March 19, 2002. The spreadsheet also states that the condenser (process gas) exit temperature is -20 °C. The Title V permit requirement is to monitor the common condenser brine inlet temperature to -15 degrees Centigrade (Condition 182). If the minimum inlet temperature of the brine is -15 °C, it is not possible for the process exit gas temperature to consistently be -20 °C. The emission calculations also do not account for all emissions during the startup and shutdown of the strippers. The strippers do not operate continuously throughout the calendar year, but instead are operated for 2 to 3 days (or for as long as 5 to 7 days) before they are shut down and then restarted. Strippers typically are shut down for product changes or for maintenance. No calculations from startup and shutdown emissions are located in the spreadsheet, either under the "Strippers" tab or other tabs. **Dryer emissions**: In the 2013 emission inventory, tabs "1700-25A" and "1700-25A.C" contain calculations for emissions from the dryers. The tabs reference the "Balance" tab for the emission factors. DPE representatives explained that the chloroprene emission factors (column AJ in the "Balance" tab) were from DuPont and provided notes that the emission factors for types 1–9 were from samples collected at the Pontchartrain site in 1996 and types 10–15 were from samples collected at the Louisville site in 1992. In the 2014 and 2015 emission inventory, tab "1700-25" state that the basis were from the factors collected for the 1996 Title V. DPE provided NEIC a copy of the 2015 factors in **Appendix** S and these are the same emission factors used in 2013 and 2014. These are	2014, and 2015 Emission Calculations **Appendix S** – 2015 Emission Factors for Neoprene Products **Appendix DD** – DPE August 2016 Email **Appendix EE** – DuPont Fugitive Emission Factor Guidance

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		also the same emission factors for chloroprene in the "Balance" tab, column AJ, as in the 2013 emission inventory. DPE representatives cannot explain how these factors are relevant to emissions from its site. The La Place facility changed its polymer stripping operations in 2005/2006, yet DuPont and DPE continue to use these outdated emission factors for 15 of the types of neoprene made on-site. In addition, for the LD factors, DPE uses chloroprene emission factors that are based on sampling data. For customer needs, DPE samples each lot and has actual analytical results and average chloroprene emission rates. However, in the ERIC calculations for 2013, 2014, and 2015, DPE used emission rates of 0.02 to 0.03 percent instead of the actual average analytical results, which in 2015 were between 0.009 and 0.049. **Fugitive emissions:** DPE calculated fugitive emissions in the neoprene process for 2013–2015 by multiplying the number of components by a DuPont factor and then dividing the result by 3. [redacted] The DPE La Place facility is the only neoprene-manufacturing facility in the United States, using emission factors developed for general refinery and chemical plants that may not be representative of the LDAR emissions at the facility. [redacted] In its August 2016 response to EPA, DPE reported that it is reviewing using other methods to calculate fugitive emissions, including using EPA's correlation equations that use actual monitoring data. **Wastewater emissions:** For 2013–2015, DPE included no emission calculations for wastewater from the chloroprene process in the emission inventory. In the neoprene	

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		process, only emissions from wastewater tanks (a diversion tank, 3-95, two aeration tanks, 4-95 and 5-95, and one clarifier, 6-95) are included in the emission inventory. Emissions from open trenches or open wastewater streams do not appear to be included. Some emissions from the wastewater streams in the poly building may be included as part of the emissions from the building wall fans (1700-66); however, time-weighted average data from the building were from the period 1999–2002, prior to process changes.	
18	**Chloroprene Title V Permit 3000-V5** **UNF0003 DuPont-Chloroprene Unit** **Condition 452 [LAC 33:III.919.F]** *Submit Emission Inventory (EI)/Annual Emission Statement: Due annually, by the 30th of April for the period January 1 to December 31 of the previous year unless otherwise directed...* **Condition 441 [LAC33:III.5107.A]** *Submit Annual Emissions Report: Due annually, by the 30th of April unless otherwise directed by DEQ, to the Office of Environmental Services in a format specified by DEQ. Identify the quantity of emissions in the previous calendar year for any toxic air pollutant listed in Table 51.1 or Table 51.3.* **Condition 440 [LAC 33:III.5107.A.2]** *Include a certification statement with the annual emission report and revisions to any emission report that attests that the information contained in the emission report is true, accurate, and complete, and that is signed by a responsible official, as defined in LAC 33:III.502. Include the full name of the responsible official, title, signature, date of signature, and phone number of the responsible official.*	**For calendar year 2015, DPE used inaccurate emission factors for the CD vent condenser in the chloroprene area. For calendar years 2013–2015, DuPont used these same emission factors.** **CD vent condenser:** [redacted] Calculations DPE provided to EPA indicate that DPE uses 2002 test data to calculate emissions. Using test data from 2002 does not accurately represent the emissions of a process that was reconfigured in 2005/2006. **Fugitive emissions:** Fugitive emissions in the chloroprene process for 2013–2015 generally were calculated by multiplying the number of components by a DuPont factor and then dividing the results by 3. In addition, for components containing 1,4-DCB, DuPont considered these components superior and divided the DuPont factor by 500. As mentioned in AON 17, these factors were developed at other DuPont facilities that do not manufacture neoprene. These facilities also do not manufacture chloroprene so the factors may not be relevant. DPE and DuPont also improperly applied DuPont's guidance and further underreported chloroprene emissions. In its August 2016 response to EPA, DPE reported that it is reviewing using other methods to calculate fugitive emissions, including using EPA's correlation equations that use actual monitoring data.	**Appendix E –** Chloroprene and Neoprene Title V Permits **Appendices T, U, and V** – 2013, 2014, and 2015 Emission Calculations **Appendix EE –** DuPont Fugitive Emission Factor Guidance
AREAS OF CONCERN			
A		**NEIC inspectors identified more leaking components than were identified in DPE's and DuPont's February 2016 LDAR report.**	Field observations/notes **Appendix K –** DPE February

EPA Monitoring Results

Process Unit	Total Leaking	Total Monitored	Percent Leaking
Chloroprene			

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		(continued, see tables below)	2016 LDAR Periodic Report **Appendix O –** DuPont February 2016 LDAR Periodic Report

Valves	30	1,555	1.93
Connectors	12	3,337	0.36
Pumps	1	48	2.08
Agitators	0	1	0
Open ends	*	234	*
PRDs	0	4	0
Neoprene			
Valves	1	600	0.17
Connectors	8	1,722	0.46
Pumps	0	14	0
Agitators	0	12	0
Open ends	*	280	*
* For any open-ended lines and plugs that were monitored and leaking above 500 ppm, the leak was attributed to the adjacent valve.			

Monitoring Comparison

Type of Component (Sitewide)	EPA Monitoring		DPE February 2016 LDAR Report Results (Nov – Dec 2015)		DuPont February 2016 LDAR Report Results (July – Nov 2015)	
	Total Monitored	Percent Leaking	Total Monitored	Percent Leaking	Total Monitored	Percent Leaking
Valve	2,155	1.44	4,339	0.59	5,813	0.04 (3rd Quarter)
Connectors	5,059	0.40	5	0	6,118	0
Pumps	62	1.61	256	0	578	0
Agitators	13	0	25	0	88	0
PRD	4	0	515	0	421	0

#	Regulatory Citation	Findings/Observations	Supporting Evidence
B		**NEIC inspectors only saw a few rubber plugs in place at open-ended lines which is inconsistent with DPE's stated policy.** DPE provided NEIC with a document describing the LDAR program at the facility, including standard operating procedures (SOPs), regulatory interpretations, etc. In this document, DPE states that in process areas where the lines contain materials that could autocatalytically polymerize, rubber plugs would be inserted into the open ends, so that they would blow out if there was an emergency overpressure. NEIC inspectors observed very few rubber plugs in place in the open-ended lines; a majority of them were left open with no plug.	Field observations/ notes **Appendix J** – DPE LDAR Procedures

#	Regulatory Citation	Findings/Observations	Supporting Evidence
C		**DPE's LDAR contractor, EMSI, used instruments that were unable to read as high as NEIC's TVA readings on a majority of the leaks discovered.** In some cases, the LDAR contractor could not confirm leaks that NEIC inspectors observed to be above 500 ppm. The sample tubing used on EMSI's TVAs was of a different material and contained more than one filter within the line. It is possible that the sample tube material contributed to the lower readings.	Field observations/ notes
D		**Process equipment containing no solvent may be misclassified as containing light liquid and inappropriately included in the LDAR database.** Some process equipment in the polymer area contained material (finished neoprene) that DPE representatives stated no longer contained any solvent. There was evidence of leaking material, as a sticky, black, tar-like material coated the outside of many of the vessels. These vessels were identified in the LDAR database as containing light liquid; however, NEIC's TVAs were unable to register any elevated reading above background on this material, indicating that it likely did not contain a light liquid. Including equipment in the LDAR monitoring program that is not possible to register above the leak definition can dilute the leak rate of the process unit, possibly giving DPE a longer period of time between monitoring events.	Field observations/ notes
E		**There does not appear to be a method for the LDAR contractors to know which pieces of equipment are in or out of service while they are conducting monitoring.** The polymer area contains many vessels that are used in batch processing. NEIC began conducting monitoring of these vessels, and was not notified that the vessels were not operating with light liquids or vapors at the time of monitoring.	Field observations/ notes
F		**In plant sampling results from 2011–2016, from two HON wastewater streams in the chloroprene process, indicated higher concentrations of chloroprene than in sampling conducted in 2014 for HON wastewater verification.** From the DCB JVC effluent tank, the highest measured concentration of beta chloroprene was 1,813.39 ppm on September 4, 2012. The average concentration of the 176 samples taken was 85 ppm. For this same location in the 2014 wastewater sampling event, chloroprene was non-detect. Effluent from the isomerization effluent tank is injected into non-hazardous deep wells. From the isomerization effluent tank, the highest measured concentration of chloroprene was 722.74 ppm on December 7, 2015. The average concentration of the 131 samples	**Appendix G** – 2011–2016 Chloroprene Analytical Results for DCB JVC Effluent Tank **Appendix H** – 2011–2016 Chloroprene Analytical Results for ISOM JVC Effluent Tank

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		taken was 37 ppm. For the same location in the 2014 wastewater sampling event, chloroprene was non-detect. These results indicate that the HON wastewater samples may not be reflective of overall chloroprene concentrations.	**Appendix I** – 2014 Wastewater Sampling Results
G		**DPE does not know which locations DuPont used for calculating the TRE values for the stripper vents and refining column vents.** Without this information, it is unclear if the TRE value calculations for these continuous streams were performed for the appropriate locations in the process. Because the calculated TRE values for the stripper vents were between 1 and 4, if the calculations were performed for locations after the series of condensers rather than before the first condenser (because the first condenser does not recover material), it is possible that DPE has three Group 1 continuous process vents. If these stripper vents are Group 1 continuous process vents, DPE must comply with the requirements during all times, including the startups and shutdowns that occur every 2–3 days at each of the strippers.	Field observations/ notes **Appendix C** – Neoprene Process Diagram
H		**Monitoring the temperature of the cooling media does not provide data on how effectively the condenser is operating to verify that the TRE values remain between 1 and 4.** For the stripper vents (three vents) and the refining column vents (two vents), DPE monitors the temperature of the cooling media in the condensers rather than the temperature of the gas exiting the condensers to verify that the unit is operating properly and that the TRE values remain between 1 and 4, as required by DPE's Title V permit.. According to paperwork provided by DPE, DuPont requested to use this approach as an alternative in its pre-compliance report in accordance with 40 CFR Part 63 Subpart U. DuPont representatives did not hear otherwise from EPA Region 6 within 45 days of submitting the request, so they believed their request was approved, and DPE continues to monitor only the cooling media temperature. This approach does not provide data that the condensers are properly cooling the gas to ensure that the TRE value remains between 1 and 4.	**Appendix F** – November 2001 Polymers and Resins I Notification of Compliance Status
I	**40 CFR § 63.480... (j)** Applicability of this subpart. *Paragraphs (j)(1) through (4) of this section shall be followed during periods of non-operation of the affected source or any part thereof.* *(1) The emission limitations set forth in this subpart and the emission limitations referred to in this subpart*	**DPE personnel have depended on DuPont's regulatory evaluations of the facility. DPE may not be aware of all of the regulatory requirements and if/when DuPont made improper regulatory determinations.** For example, in April 2011, EPA adjusted the polymers and resins I regulation to require continuous compliance during times of startup as well as shutdown. DuPont's 40 CFR Part 63 Subpart U reports refer to a startup and shutdown malfunction plan that is no longer	Field observations/ notes

#	Regulatory Citation	Findings/Observations	Supporting Evidence
	shall apply at all times except during periods of non-operation of the affected source (or specific portion thereof) resulting in cessation of the emissions to which this subpart applies. However, if a period of non-operation of one portion of an affected source does not affect the ability of a particular emission point to comply with the emission limitations to which it is subject, then that emission point shall still be required to comply with the applicable emission limitations of this subpart during the period of non-operation. For example, if there is an overpressure in the reactor area, a storage vessel that is part of the affected source would still be required to be controlled in accordance with the emission limitations in §63.484. *(2) The emission limitations set forth in subpart H of this part, as referred to in §63.502, shall apply at all times, except during periods of non-operation of the affected source (or specific portion thereof) in which the lines are drained and depressurized, resulting in cessation of the emissions to which §63.502 applies.* *(3) The owner or operator shall not shut down items of equipment that are required or utilized for compliance with this subpart during times when emissions (or, where applicable, wastewater streams or residuals) are being routed to such items of equipment if the shutdown would contravene requirements of this subpart applicable to such items of equipment.* *(4) In response to an action to enforce the standards set forth in this subpart, an owner or operator may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by a malfunction, as defined in §63.2. Appropriate penalties may be assessed, however, if the owner or operator fails to meet the burden of proving all the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.*	required by the regulation because the facility is required to comply during all times of operation, with limited exceptions.	

<table>
<tr><th>#</th><th>Regulatory Citation</th><th>Findings/Observations</th><th>Supporting Evidence</th></tr>
<tr><td>J</td><td>40 CFR § 63.111 Definitions – Surge control vessel means feed drums, recycle drums, and intermediate vessels. Surge control vessels are used within a chemical manufacturing process unit when in-process storage, mixing, or management of flow rates or volumes is needed to assist in production of a product.</td><td>Unstripped polymer tanks contain up to 16 percent chloroprene and vent to the atmosphere.

The unstripped tanks (up to six tanks) hold neoprene prior to the stripping process. The neoprene at this stage contains unreacted chloroprene (up to 16 percent). These surge vessels are nitrogen blanketed but vent to the atmosphere once the pressure reaches 5.5 psi. These surge vessels are smaller than the size for which emission controls are required under 40 CFR Part 63 Subpart G, as referenced by 40 CFR Part 63 Subpart U. These units are another source of chloroprene emissions.</td><td>Field observations/ notes</td></tr>
<tr><td>K</td><td></td><td>Environmental records from stack tests are not kept for more than 5 years, even though test data is still currently relied upon for emission calculations.

NEIC requested process condition data (i.e., production rate and operational data) from stack tests that were conducted in 2002. DPE continues to use these test results to calculate emissions from the chloroprene process and from the CD vent condenser in the neoprene process.

DPE representatives responded that the process data are no longer available electronically since it is not environmentally critical and that, in accordance with the facility's document policy, data are not kept for more than 5 years.

Although the data were generated more than 5 years ago, DPE continues to rely on test data to calculate emissions. Without an understanding of the process conditions under which the stack tests were conducted, it is unclear if the tests are still reflective of emissions based on current plant operations.

For example, the CD vent condenser is a smaller pipe that was easily accessible by LDAR monitoring personnel. The vapor stream exiting this pipe flamed out the TVA units, indicating VOC emissions of greater than 10,000 ppm.</td><td>Field observations/ notes</td></tr>
<tr><td>L</td><td></td><td>Laboratory testing of aqueous wastes generated in the poly unit and subsequent calculations suggest possible additional emissions and exposure of DPE employees to significant chloroprene concentrations.

NEIC laboratory analysis results for chloroprene in water samples collected in the poly unit are in Appendix Y, with an abbreviated summary shown below.

<table>
<tr><th colspan="2">Chloroprene Analysis Summary</th></tr>
<tr><th>Location Description</th><th>micrograms per liter (ug/L)</th></tr>
<tr><td rowspan="2">Stripper #1 Condenser</td><td>239,700</td></tr>
<tr><td>205,200</td></tr>
</table>
</td><td>Appendix Y – NEIC Laboratory Report</td></tr>
</table>

#	Regulatory Citation	Findings/Observations	Supporting Evidence

	220,000
Centrifugal Separator Pot Receiver Flow	3,680
	4,500
	4,428
Stripper #3 Water Condenser	244,100
	319,000
	239,200
#1 Precondenser Runoff	86,400
	90,760
	93,420
	96,240
	95,750
#3 Precondenser Runoff	103,000
	110,500

Based on these results, Henry's Law can be used to estimate the concentration of chloroprene:

Henry's Law:

$$H^{cp} = \frac{C_a}{p}$$

Where H^{cp} is the Henry's Law constant for chloroprene in Molarity per atmosphere pressure ($^{M}/_{atm}$), C_a is the concentration of chloroprene in the aqueous phase in Molarity (M), and p is the partial pressure of chloroprene in the headspace above the solution in atmosphere pressure (atm).

Several values of Henry's Law constants are available for chloroprene. A high value of 0.032 (Hine and Mookerjee, 1975) and a low value of 0.018 (Sanders, 2015) were found in the scientific literature.

Converting the measured concentration units from microgram per liter to Molarity is done:

$$239700\ \frac{ug}{L} \cdot \frac{10^{-6}\ g}{ug} \cdot \frac{mol}{88.53\ g} = 2.707 \cdot 10^{-3} M$$

The molecular formula of chloroprene is C_4H_5Cl with a molar mass of 88.5335 $^{g}/_{mol}$.

#	Regulatory Citation	Findings/Observations	Supporting Evidence

After converting to Molarity, the partial pressure of chloroprene above the solution can be estimated with Henry's Law:

$$H^{cp} = \frac{C_a}{p}$$

Rearranging the equation to solve for partial pressure:

$$p = \frac{C_a}{H^{cp}}$$

The partial pressure of chloroprene estimated above the solution is shown in the table below using the Henry's Law constants given previously.

Estimated Chloroprene Pressure

Location Description	Partial Pressure (atm)	
	H^{cp} 0.032 $M/_{atm}$	H^{cp} 0.018 $M/_{atm}$
Stripper #1 Condenser	0.084608	0.150414
	0.07243	0.128765
	0.077654	0.138052
Centrifugal Separator Pot Receiver Flow	0.001299	0.002309
	0.001588	0.002824
	0.001563	0.002779
Stripper #3 Water Condenser	0.086161	0.153175
	0.112599	0.200175
	0.084431	0.1501
#1 Precondenser Runoff	0.030497	0.054217
	0.032036	0.056953
	0.032975	0.058622
	0.03397	0.060391
	0.033797	0.060084
#3 Precondenser Runoff	0.036356	0.064633
	0.039004	0.06934

#	Regulatory Citation	Findings/Observations	Supporting Evidence

The partial pressures can be converted into parts per million by multiplying by 1,000,000 assuming a total pressure of 1 atm. Assuming an atmospheric pressure of 1 atm is appropriate since La Place is 10 feet above sea level.

The concentration of chloroprene above the water samples is estimated in the table below.

Estimated Vapor Phase Chloroprene Concentration

Location Description	Concentration (ppm)	
Stripper #1 Condenser	84,608	150,414
	72,430	128,765
	77,654	138,052
Centrifugal Separator Pot Receiver Flow	1,299	2,309
	1,588	2,824
	1,563	2,779
Stripper #3 Water Condenser	86,161	153,175
	112,599	200,175
	84,431	150,100
#1 Precondenser Runoff	30,497	54,217
	32,036	56,953
	32,975	58,622
	33,970	60,391
	33,797	60,084
#3 Precondenser Runoff	36,356	64,633
	39,004	69,340

The results of the Henry's Law calculations show there is a significant concentration of chloroprene that can be generated from the wastewater being generated in the poly unit.

In terms of environmental release, the wastewater samples collected in the poly unit were from open sources flowing from the process vessel in open trenches into floor drains. Large fans in the poly unit push air into the building, but there is no emissions control device for the exhaust created by this ventilation.

Further, the possible concentrations of chloroprene to which workers could be exposed might be hazardous. The current Occupational Safety and Health Administration (OSHA) personal exposure limit for chloroprene is 25 ppm. The concentration of chloroprene above the wastewater can be between 50 and 8000 times the OSHA limit, and would

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		require very large dilutions to reach acceptable limits. Further investigation of this hazard is strongly suggested. Jack Hine, Pradip K. Mookerjee, Structural effects on rates and equilibriums. XIX. Intrinsic hydrophilic character of organic compounds. Correlations in terms of structural contributions, *J. Org. Chem.*, 1975, 40 (3), pp 292–298 R. Sander: Compilation of Henry's law constants, *Atmos. Chem. Phys.*, 15, 4399–4981, 2015	
M		**DPE may have additional Group 1 storage tanks under 40 CFR Part 63 Subpart U requiring additional controls.** EPA lists the vapor pressure for chloroprene at 20 °C (68 °F) at 188 mmHg. The 2013–2015 emission inventory calculations list the 1700-21A, 2 MM pound CD tank contents as 100 percent chloroprene and a daily average liquid surface temperature of 466.8 rankine (R) (7.13 °F). According to the monomer plant diagram, this tank is cooled with -18 °C (-1 °F) brine. Emission ID points for crude storage tanks 1, 2, and 3, 1700-21.1, 1700-21.2, and 700-21.3, are not listed in the 2013–2015 emission inventory calculations; however, the tab "1700-63" includes crude storage tanks 1, 2, and 3. This tab lists the temperature of the vapor in the common vent header as 5 °C (41 °F). These chloroprene tanks are identified as venting to the atmosphere in the emission inventory calculations. If the actual storage temperature of the 2 MM pound CD storage tank is just 10 °F higher, at 17 °F, the tank would have a vapor pressure of 0.76 psi, making it a Group 1 tank requiring additional control. If the actual storage temperatures of the crude storage tanks 2 and 3 are just 6 °F higher, at 47 °F, these tanks would have a vapor pressure of 1.92 psi, making them Group 1 tanks requiring additional controls.	**Appendix Z –** Chloroprene Vapor Pressure Curve **Appendices T, U, and V –** 2013, 2014, and 2015 Emission Calculations
N		**The minimum pH established during the HAPF performance test is not sufficient to control chlorine emissions, and also results in excess emissions of sulfur dioxide gas.** DPE (formerly DuPont) was required to establish minimum/maximum operating parameters during performance testing to ensure compliance with the emission standards of the Hazardous Waste Combustor MACT. One of the required parameters is minimum pH, which was established as pH 2.1 in the scrubbing liquor of the DynaWave scrubber. According to DPE representative Doug Melancon, the DynaWave scrubber is the only air	**Appendix FF –** DPE July 2016 Email **Appendix GG –** Dr. Lowry Expert Opinion

#	Regulatory Citation	Findings/Observations	Supporting Evidence
		pollution control device for the HAPF system and effectively removes HCl/Cl_2 from the vent scrubber effluent. Sodium bisulfite is added to the scrubber solution to remove Cl_2 gas by reaction of bisulfite with hypochlorous acid (Cl_2 dissolved in water). However, at pH 2.1, the Cl_2 gas will not dissolve in the water within the scrubber, preventing it from participating in the aqueous phase reaction with bisulfite. Additionally, at low pH, the bisulfite disassociates to produce sulfur dioxide, which is released through stack emissions. As seen in **AON 14,** there were many instances when the actual pH of the scrubber effluent was less than 2.1.	
O	**40 CFR § 63.1207...(j)** Notification of compliance—*(1) Comprehensive performance test. (i) Except as provided by paragraphs (j)(4) and (j)(5) of this section, within 90 days of completion of a comprehensive performance test, you must postmark a Notification of Compliance documenting compliance with the emission standards and continuous monitoring system requirements, and identifying operating parameter limits under §63.1209.* **(ii)** *Upon postmark of the Notification of Compliance, you must comply with all operating requirements specified in the Notification of Compliance in lieu of the limits specified in the Documentation of Compliance required under §63.1211(c).*	**It is unclear if DPE is complying with the parameters established in the most recent comprehensive performance test.** DuPont commenced a comprehensive performance test for the hydrochloric acid production furnace (subject to the Hazardous Waste Combustor MACT) in March 2015. A notification of compliance that describes the results of the CPT and lists the relevant continuous monitoring parameters established by that test was sent to the State of Louisiana within 90 days of the completion of the CPT. DPE representative Doug Melancon stated during an interview with NEIC inspectors in June 2016 that the parameters established during the 2010 comprehensive performance test are still in force until the State of Louisiana issues the facility a permit modification incorporating the parameter values established during the 2015 CPT. DPE is required to comply with the newly established parameter values upon postmark of the notification of compliance, which was June 23, 2015. A review of the semiannual reports verifies that DPE believes the 2010 CPT parameter limits continue to be in force; however, beginning with the July 2015 semiannual report, the facility notes that it is now complying with the limits established during the 2015 performance test.	**Appendix X** – 2015 Hazardous Waste Comprehensive Performance Test **Appendix CC** – Hazardous Waste Combustor Periodic Reports