FLUOROMONOMERS AND IXM MANUFACTURING PROCESSES EMISSIONS TEST REPORT TEST DATES: 19-23 MARCH 2018

THE CHEMOURS COMPANY FAYETTEVILLE, NORTH CAROLINA

Prepared for:

THE CHEMOURS COMPANY
22828 NC Hwy 87 W
Fayetteville, North Carolina 28306

Prepared by:

WESTON SOLUTIONS, INC.
1400 Weston Way
P.O. Box 2653
West Chester, Pennsylvania 19380

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1. INTRODUCTION

1.1 FACILITY AND BACKGROUND INFORMATION

The Chemours Fayetteville Works (Chemours) is located in Bladen County, North Carolina, approximately ten miles south of the city of Fayetteville. Chemours operating areas on the site include the Fluoromonomers, IXM and Polymers Processing Aid (PPA) manufacturing areas, Wastewater Treatment, and Powerhouse.

Chemours contracted Weston Solutions, Inc. (WESTON) to perform HFPO Dimer Acid Fluoride, captured as HFPO Dimer Acid emission testing on three sources at the facility (Division, Polymers, and Semi-Works stacks). Testing was performed on 19-23 March 2018 and generally followed the "Emission Test Protocol" reviewed and approved by the North Carolina Department of Environmental Quality (NCDEQ). This report provides the results from the emission test program.

1.2 TEST OBJECTIVES

The specific objectives for this test program were as follows:

- Measure the emissions concentrations and mass emissions rates of HFPO Dimer Acid Fluoride from the Division stack, Polymers stack and Semi-Works stack which are located in the Fluoromonomers and IXM processes.
- Monitor and record process and emissions control data in conjunction with the test program.
- Provide representative emissions data.

1.3 TEST PROGRAM OVERVIEW

During the emissions test program, the concentrations and mass emissions rates of HFPO Dimer Acid Fluoride were measured on three sources (Division, Polymers, and Semi-Works).

Tables 1-1, 1-2 and 1-3 provide a summary of the test locations and the parameters that were measured along with the sampling/analytical procedures that were followed.

Section 2 provides a summary of test results. A description of the processes is provided in Section 3. Section 4 provides a description of the test locations. The sampling and analytical procedures are provided in Section 5. Detailed test results and discussion are provided in Section 6.

Appendix C includes the summary reports for the laboratory analytical results. The full laboratory data packages are provided in electronic format and on CD with each hard copy.

Table 1-1
Sampling Plan for Division Stack Gas

Sampling Point & Location	**Division Stack**				
Number of Tests:	3				
Parameters To Be Tested:	HFPO Dimer Acid Fluoride (HFPO-DAF)	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	EPA M1, M2, M3A, and M4 in conjunction with M-0010 tests	EPA M3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	NA[6]	NA		NA
Sample Size	> 1m^3	NA	NA	NA	NA
Total Number of Samples Collected[1]	3	3	3	3	3
Reagent Blanks (Solvents, Resins)[1]	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	0	0	0	0
Trip Blanks[1,2]	1 set	0	0	0	
Lab Blanks	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	0	0	0	0
Total No. of Samples	7[5]	3	3	3	3

Key:

[1] Sample collected in field.

[2] Trip blanks include one XAD-2 resin module and one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction (front half, back half and condensate).

[4] One set of media blank archived at laboratory at media preparation.

[5] Actual number of samples collected in field.

[6] Not applicable.

Table 1-2
Sampling Plan for Polymers Stack

Sampling Point & Location	**Polymers Stack**				
Number of Tests:	4 (2 during Recycle Still and Polymerization and 2 during Polymerization and Line Four Extrusion)				
Parameters To Be Tested:	HFPO Dimer Acid Fluoride (HFPO-DAF)	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	EPA M1, M2, M3A, and M4 in conjunction with M-0010 tests	EPA M3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	NA[6]	NA		NA
Sample Size	> 1m^3	NA	NA	NA	NA
Total Number of Samples Collected[1]	4	4	4	4	4
Reagent Blanks (Solvents, Resins)[1]	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	0	0	0	0
Trip Blanks[1,2]	1 set	0	0	0	
Lab Blanks	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	0	0	0	0
Total No. of Samples	8[5]	4	4	4	4

Key:

[1] Sample collected in field.

[2] Trip blanks include one XAD-2 resin module and one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction (front half, back half and condensate).

[4] One set of media blank archived at laboratory at media preparation.

[5] Actual number of samples collected in field.

[6] Not applicable.

Table 1-3
Sampling Plan for Semi-Works Stack

Sampling Point & Location	**Semi-Works Stack**				
Number of Tests:	3				
Parameters To Be Tested:	HFPO Dimer Acid Fluoride (HFPO-DAF)	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	EPA M1, M2, M3A, and M4 in conjunction with M-0010 tests	EPA M3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	NA[6]	NA		NA
Sample Size	> 1m^3	NA	NA	NA	NA
Total Number of Samples Collected[1]	3	3	3	3	3
Reagent Blanks (Solvents, Resins)[1]	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	0	0	0	0
Trip Blanks[1,2]	1 set	0	0	0	
Lab Blanks	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	0	0	0	0
Total No. of Samples	7[5]	3	3	3	3

Key:

[1] Sample collected in field.

[2] Trip blanks include one XAD-2 resin module and one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction (front half, back half and condensate).

[4] One set of media blank archived at laboratory at media preparation.

[5] Actual number of samples collected in field.

[6] Not applicable.

2. SUMMARY OF TEST RESULTS

A total of three test runs were performed on the Division Stack. Four test runs (2 during Recycle Still and Polymerization and 2 during Polymerization and Line Four Extrusion) were performed on the Polymers Stack. A total of three tests were performed on the Semi-Works Stack. Table 2-1 provides a summary of the HFPO Dimer Acid emission test results. Detailed test results summaries are provided in Section 6. It should be noted, during runs 2 and 3 of the Division Stack, vinyl ethers north was not in operation. Due to a communications issue, WESTON was unaware of the process shut-down and continued testing.

It is important to note that emphasis is being placed on the characterization of the emissions based on the stack test results. Research conducted in developing the protocol for stack testing HFPO Dimer Acid Fluoride, HFPO Dimer Acid Ammonium Salt and HFPO Dimer Acid realized that the resulting testing, including collection of the air samples and extraction of the various fraction of the sampling train, would result in all three compounds being expressed as simply the HFPO Dimer Acid. However, it should be understood that the total HFPO Dimer Acid results provided on Table 2-1 and in this report include a percentage of each of the three compounds.

Table 2-1
Summary of HFPO Dimer Acid Test Results

Source	Run No.	Emission Rates	
		lb/hr	g/sec
Division	1	1.03E-01	1.30E-02
	2	2.09E-02	2.63E-03
	3	1.24E-02	1.56E-03
	Average[2]	4.54E-02	5.73E-03
Polymers (Recycle Still and Polymerization)	1	6.63E-04	8.35E-05
	2	2.90E-04	3.65E-05
	Average	4.77E-04	6.00E-05
Polymers (Polymerization and Line Four Extrusion)	1	4.93E-04	6.21E-05
	2	5.21E-04	6.56E-05
	Average	5.07E-04	6.38E-05
Semi-Works	1	7.32E-04	9.22E-05
	2	9.60E-04	1.21E-04
	3	2.96E-03	3.72E-04
	Average	1.55E-03	1.95E-04

3. PROCESS DESCRIPTIONS

The Fluoromonomers and IXM areas are included in the scope of this test program.

3.1 FLUOROMONOMERS

These facilities produce a family of fluorocarbon compounds used to produce Chemours products such as Nafion®, Krytox®, and Viton®, as well as sales to outside customers.

The following process streams are vented to the Division Waste Gas Scrubber (NCD-Hdr1):

- HFPO Refining
- VEN Crude Ether Process
- VEN Condensation
- Refined VE Process

The Division Waste Gas Scrubber is vented to a process stack (NEP-Hdr1). In addition, the following building air systems are vented to this stack:

- HFPO RV Catch Pots
- HFPO Tower Exhaust Blower
- VEN Permeators Catch Pot
- HDT Vent
- VEN Tower Exhaust Blower
- Analyzer Room Blower
- HFPO Crude Dryer Moisture Analyzer Vent

3.2 SEMI-WORKS AREA

Semi-Works is generally a Research and Development facility. However, there are two products made in this unit on a periodic basis: Dimer Peroxide and a high Equivalent Weight (EW) polymer. The Dimer Peroxide is then used in the IXM Polymers manufacturing area and the high EW polymer is used in the IXM Products area to make a specific membrane product.

The following process streams vent to the Semi-Works building stack:

- Continuous Polymerization Process – when making high EW polymer
- Batch Polymerization – when making the Dimer Peroxide

3.3 POLYMERS

The polymers area consists of a polymerization process, Finishing and Recycle. There are two types of polymer produced, using products made in the Fluoromonomers and IXM Precursors areas: SR polymer and CR polymer. Both SR and CR polymerization processes take place in a solvent. The reaction is initiated and sustained by continuous addition of Dimer Peroxide initiator. There is a Recycle Still that takes solution and removes any impurities, allowing the solution to be used again. The finishing area takes the polymer produced during polymerization and transforms it into pellets.

3.4 PROCESS OPERATIONS AND PARAMETERS

Testing during the following operations provided "normal" conditions while running products and operations that were expected to result in the most conservative (i.e., highest) emissions for the target compound.

Source	Operation/Product	Batch or Continuous
Division	VEN/PPVE	Semi-continuous – Condensation is continuous, Agitated Bed Reactor is batch for 30-40 mins at end of each run, Refining (ether column) is batch
Semi-Works	Dimer Peroxide High EW Polymer	Batch Continuous
Polymer Stack	SR Polymer	Continuous – Polymerization Batch – Recycle Still Batch – Line Four extrusion

During the test program, the following parameters were monitored by Chemours and are included in Appendix A.

- Fluoromonomers & IXM Processes
    - Division Waste Gas Scrubber
        - Caustic recirculation flow rate

There are no parameters to monitor from Polymers or Semi-Works, as there are no control devices associated with these stacks.

4. DESCRIPTION OF TEST LOCATIONS

4.1 DIVISION STACK

Two 6” ID test ports were installed on the 36” ID fiberglass stack. The ports were placed ~ 30’ (10 diameters) from the nearest downstream disturbance and 9’ (3 diameters) from the stack exit. The four vents that enter the top of the stack and the one vent ~ 11’ below are catch pots which under normal process operations do not discharge to the stack. They are used to vent process gas to the stack in the event of a process upset and are not considered a flow contributor or a disturbance.

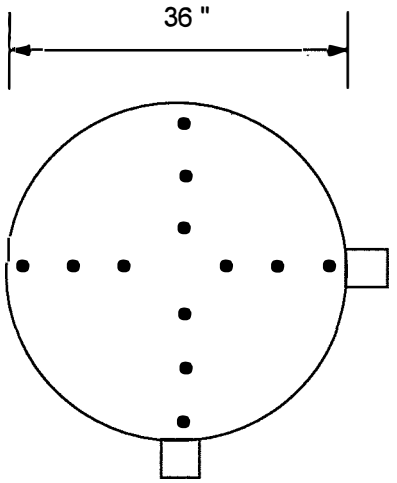
Per EPA Method 1, a total of 12 traverse points (6 per axis) were used for M-0010 isokinetic sampling. Figure 4-1 provides a schematic of the test ports and traverse point locations.

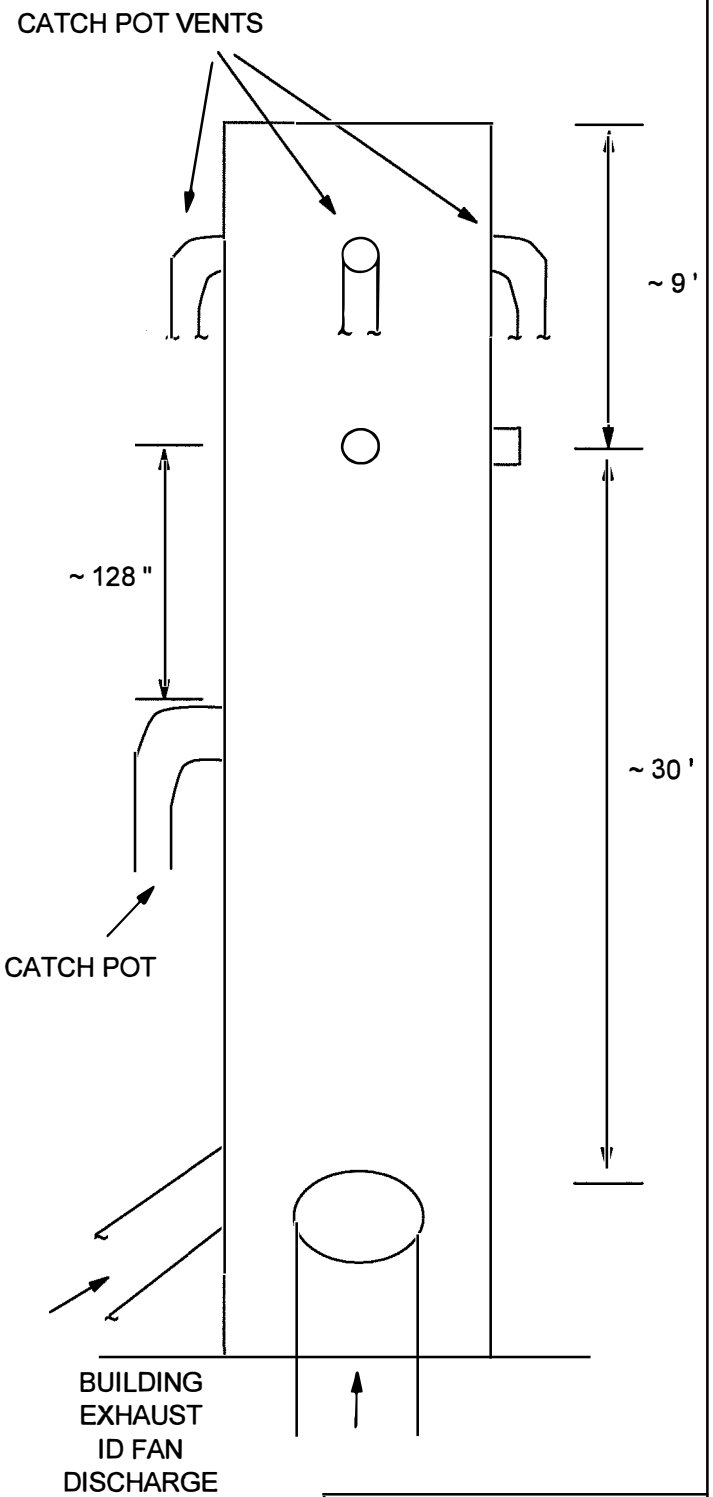
4.2 POLYMERS STACK

The Polymers stack is a 30 inch ID fiberglass stack located near the roof edge. Vent lines enter the stack at various points and a significant straight run of vertical stack without flow disturbances is not available. Two sample ports are installed in the stack 30 inches down from the stack exit and 58 inches up from the last vent line entry point. Per EPA Method 1, twenty-four traverse points, 12 per port, were used for sampling. Figure 4-2 provides a schematic of the test port and traverse point locations. All dimensions were verified on site prior to sampling.

4.3 SEMI-WORKS STACK

The semi-works stack is a circular steel stack outside the laboratory building. The ID fan is located at ground level. The stack ID is 27 inches. Two sample ports, 90° apart are installed 4½’ down from the top of the stack and 15’ up from the ID fan discharge. Per EPA Method 1, sixteen traverse points, 8 per port, were used for sampling. Figure 4-3 provides a schematic of the test port and traverse point locations. All dimensions were verified on site prior to sampling.

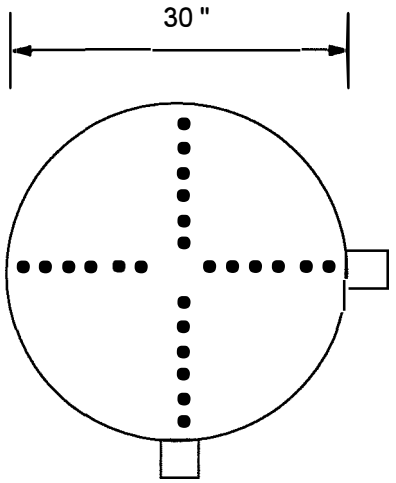


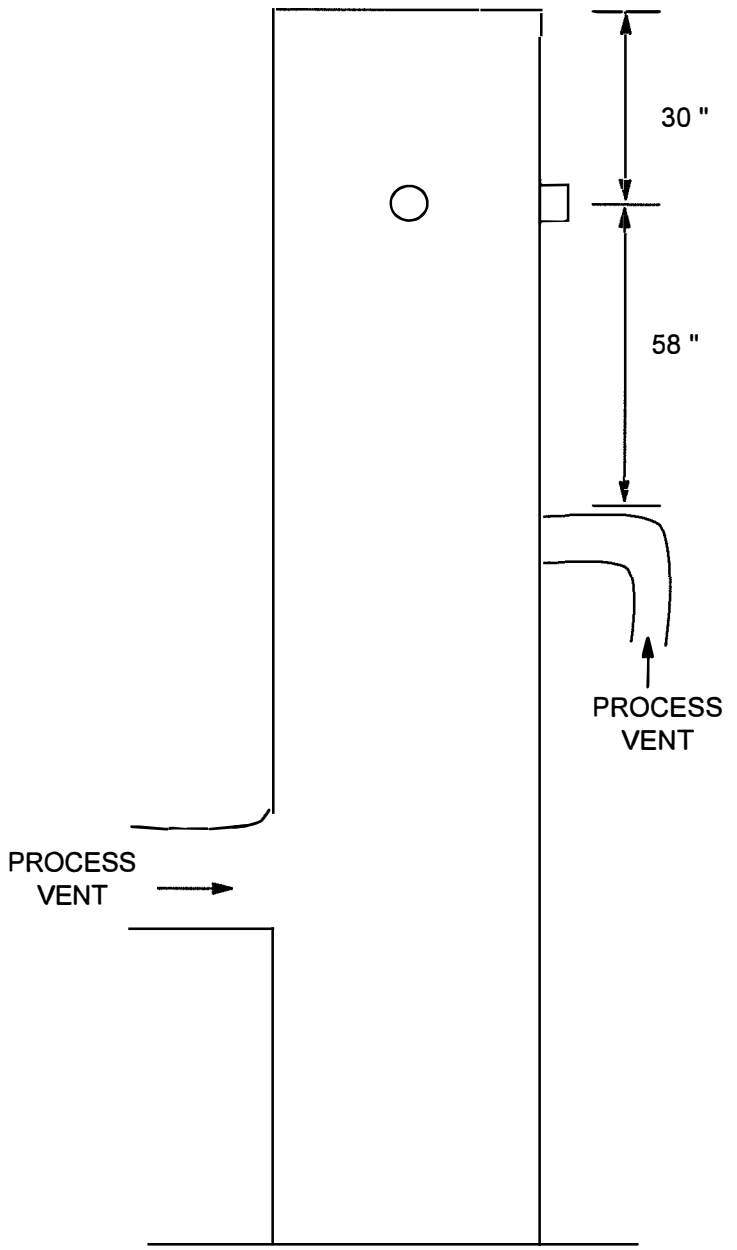


TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 5/8
2	5 3/8
3	10 7/8
4	26
5	31 5/8
6	33 3/8

DRAWING NOT TO SCALE

FIGURE 4-1
DIVISION STACK TEST PORT
AND TRAVERSE POINT LOCATIONS



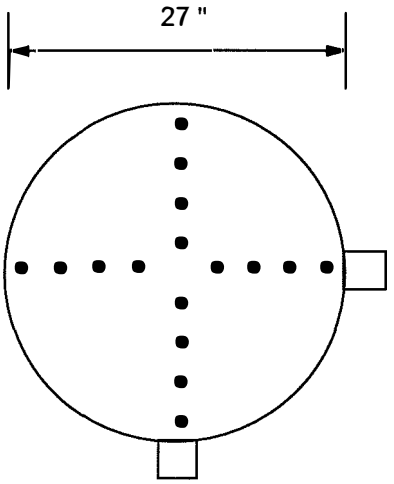


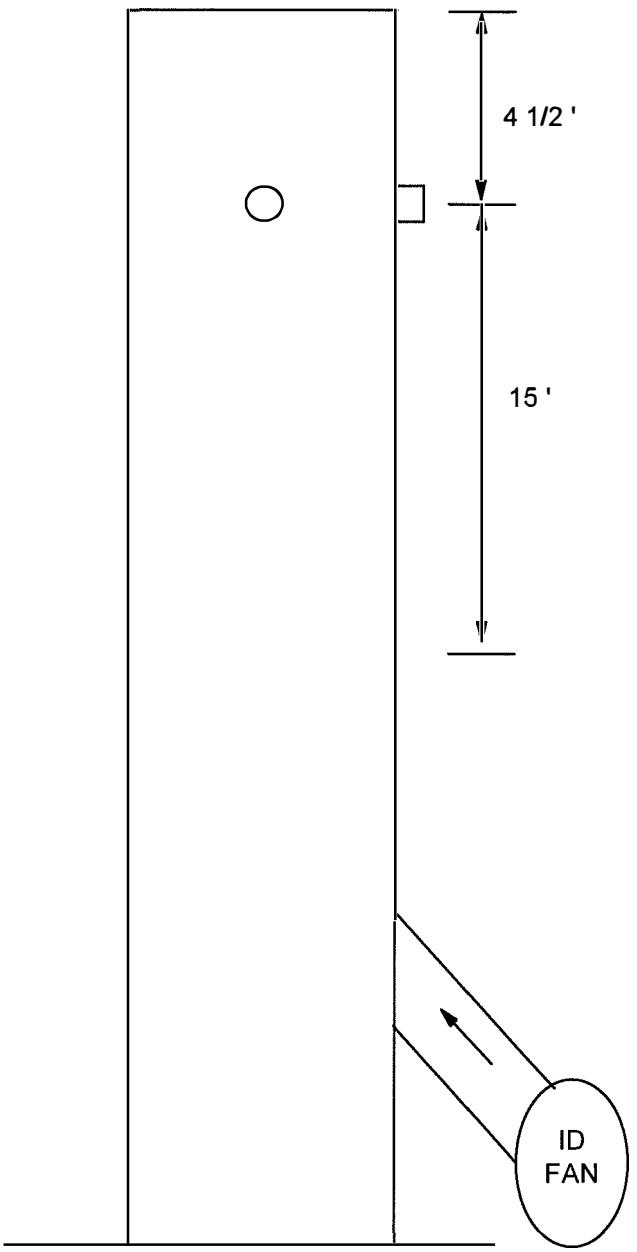
TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	2
3	3 1/2
4	5 1/4
5	7 1/2
6	10 5/8
7	19 3/8
8	22 1/2
9	24 3/4
10	26 1/2
11	28
12	29

DRAWING NOT TO SCALE

FIGURE 4-2
POLYMERS STACK TEST PORT
AND TRAVERSE POINT LOCATIONS

IASDATA\CHEMOURS\15418.002.002\FIGURE 4-2 POLYMERS STACK





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1
2	2 7/8
3	5 1/4
4	8 3/4
5	18 1/4
6	21 3/4
7	24 1/8
8	26

DRAWING NOT TO SCALE

FIGURE 4-3
SEMI-WORKS STACK TEST PORT
AND TRAVERSE POINT LOCATIONS

5. SAMPLING AND ANALYTICAL METHODS

5.1 STACK GAS SAMPLING PROCEDURES

The purpose of this section is to describe the stack gas emissions sampling trains and to provide details of the stack sampling and analytical procedures utilized during the emissions test program.

5.1.1 Pre-Test Determinations

Preliminary test data were obtained at each test location. Stack geometry measurements were measured and recorded, and traverse point distances verified. A preliminary velocity traverse was performed utilizing a calibrated "S" type pitot tube and an inclined manometer to determine velocity profiles. Flue gas temperatures were observed with a calibrated direct readout panel meter equipped with a chromel-alumel thermocouple. Preliminary water vapor content was estimated by wet bulb/dry bulb temperature measurements.

A check for the presence or absence of cyclonic flow was conducted at each test location. The cyclonic flow checks were negative (< 20°) verifying that both sources were acceptable for testing.

Preliminary test data was used for nozzle sizing and sampling rate determinations for isokinetic sampling procedures.

Calibration of probe nozzles, pitot tubes, metering systems, and temperature measurement devices was performed as specified in Section 5 of EPA Method 5 test procedures.

5.2 STACK PARAMETERS

5.2.1 EPA Method 0010

The sampling train utilized to perform the HFPO Dimer Acid sampling was an EPA Method 0010 train (see Figure 5-1). The Method 0010 consisted of a borosilicate nozzle that attached directly to a heated borosilicate probe. In order to minimize possible thermal degradation of the HFPO Dimer Acid, the probe and particulate filter were heated above stack temperature to minimize water vapor condensation before the filter. The probe was connected directly to a heated borosilicate filter holder containing a solvent extracted glass fiber filter.

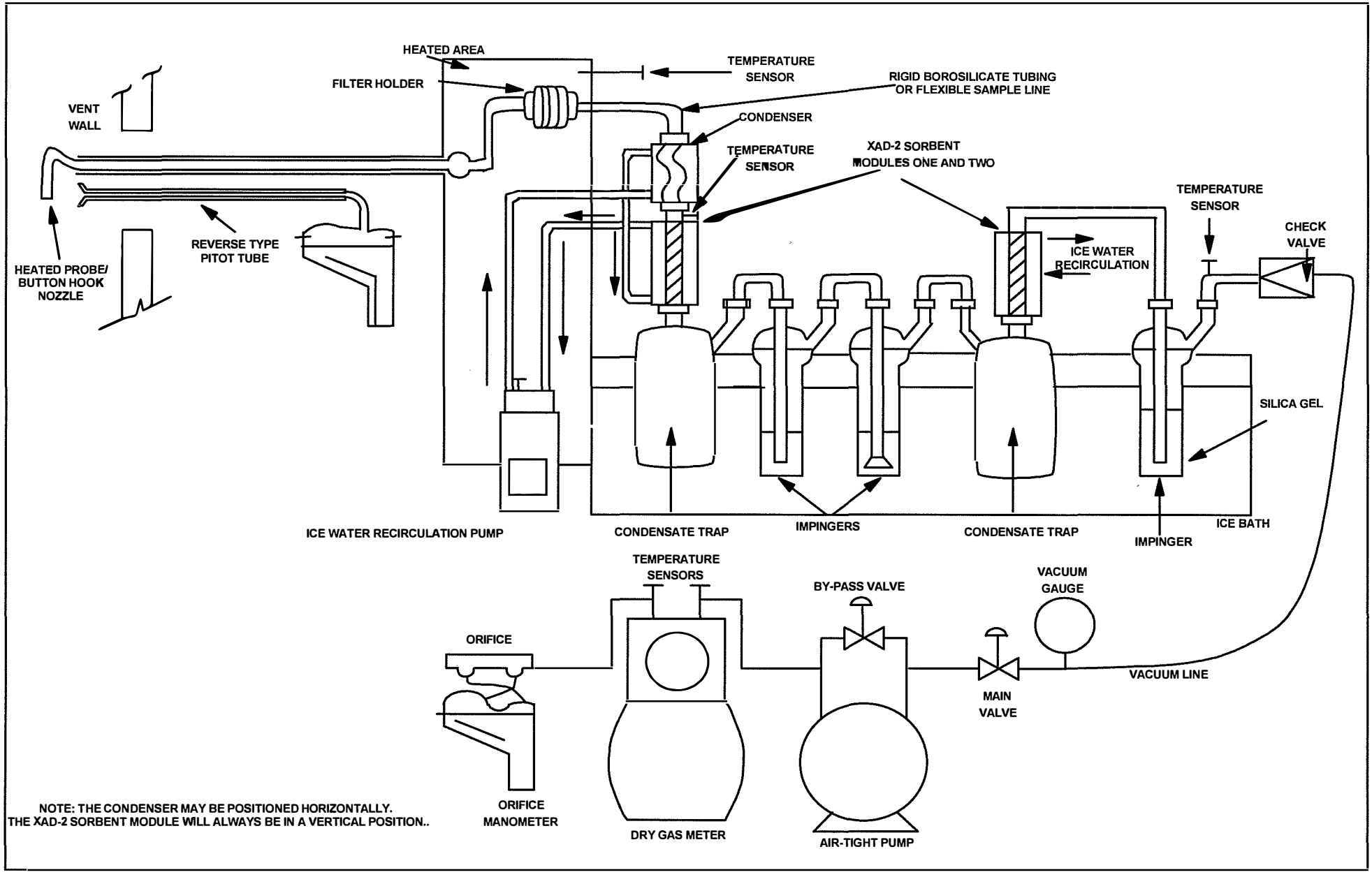


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

A section of borosilicate glass [or flexible polyethylene tubing (Division and Semi-Works Stacks only)] connected the filter holder exit to a Grahm (spiral) type ice water-cooled condenser, an icewater-jacketed sorbent module containing approximately 40 grams of XAD-2 resin. The XAD-2 resin tube was equipped with an inlet temperature sensor. The XAD-2 resin trap was followed by a condensate knockout impinger and a series of two impingers that contained 100-ml of high purity distilled water. The train also included a second XAD-2 resin trap behind the impinger section to evaluate possible sampling train breakthrough. Each XAD-2 resin trap was connected to a 1-L condensate knockout trap. The final impinger contained 300 grams of dry pre-weighed silica gel. All impingers and the condensate traps were maintained in an ice bath. Ice water was continuously circulated in the condenser and both XAD-2 modules to maintain method required temperature. A control console with a leakless vacuum pump, a calibrated orifice, and dual inclined manometers was connected to the final impinger via an umbilical cord to complete the sample train.

HFPO Dimer Acid Fluoride (CAS No. 2062-98-8) that is present in the stack gas is expected to be captured in the sampling train along with HFPO Dimer Acid (CAS No. 13252-13-6). HFPO Dimer Acid Fluoride undergoes hydrolysis instantaneously in water in the sampling train and during the sample recovery step and will be converted to HFPO Dimer Acid such that the amount of HFPO Dimer Acid emissions represents a combination of both HFPO Dimer Acid Fluoride and HFPO Dimer Acid.

During sampling, gas stream velocities were measured by attaching a calibrated "S"-type pitot tube into the gas stream adjacent to the sampling nozzle. The velocity pressure differential was observed immediately after positioning the nozzle at each traverse point, and the sampling rate adjusted to maintain isokineticity ± 10. Flue gas temperature was monitored at each point with a calibrated panel meter and thermocouple. Isokinetic test data was recorded at each traverse point during all test periods, as appropriate. Leak checks were performed on the sampling apparatus according to reference method instructions, prior to and following each run, component change (if required) or during midpoint port changes.

5.2.2 EPA Method 0010 Sample Recovery

At the conclusion of each test, the sampling train was dismantled, the openings sealed, and the components transported to the field laboratory trailer for recovery.

A consistent procedure was employed for sample recovery:

1. The two XAD-2 covered (to minimize light degradation) sorbent modules (1 and 2) were sealed and labeled.

2. The glass fiber filter(s) were removed from the holder with tweezers and placed in a polyethylene container along with any loose particulate and filter fragments.

3. The particulate adhering to the internal surfaces of the nozzle, probe and front half of the filter holder were rinsed with a solution of methanol and ammonium hydroxide into a polyethylene container while brushing a minimum of three times until no visible particulate remains. Particulate adhering to the brush was rinsed with methanol/ ammonium hydroxide into the same container. The container was sealed.

4. The volume of liquid collected in the first condensate trap was measured, the value recorded, and the contents poured into a polyethylene container.

5. All train components between the filter exit and the first condensate trap were rinsed with methanol/ammonium hydroxide. The solvent rinse was placed in a separate polyethylene container and sealed.

6. The volume of liquid in the impingers one, two, and second condensate trap were measured, the values recorded, and sample was placed in the same container as step 4 above and sealed.

7. The two impingers, condensate trap, and connectors were rinsed with methanol/ ammonium hydroxide. The solvent sample was placed in a separate polyethylene container and sealed.

8. The silica gel in the final impinger was weighed and the weight gain value recorded.

9. Site (reagent) blank samples of the methanol/ammonium hydroxide, XAD resin, filter and distilled water were retained for analysis.

Each container was labeled to clearly identify its contents. The height of the fluid level was marked on the container of each liquid sample to provide a reference point for a leakage check during transport. All samples were maintained cool.

During each test campaign, a M-0010 blank train was setup near the test location, leak checked and recovered along with the respective sample train. Following sample recovery, all samples were transported to the TestAmerica Inc. for sample extraction and analysis.

See Figure 5-2 for a schematic of the M-0010 sample recovery process.

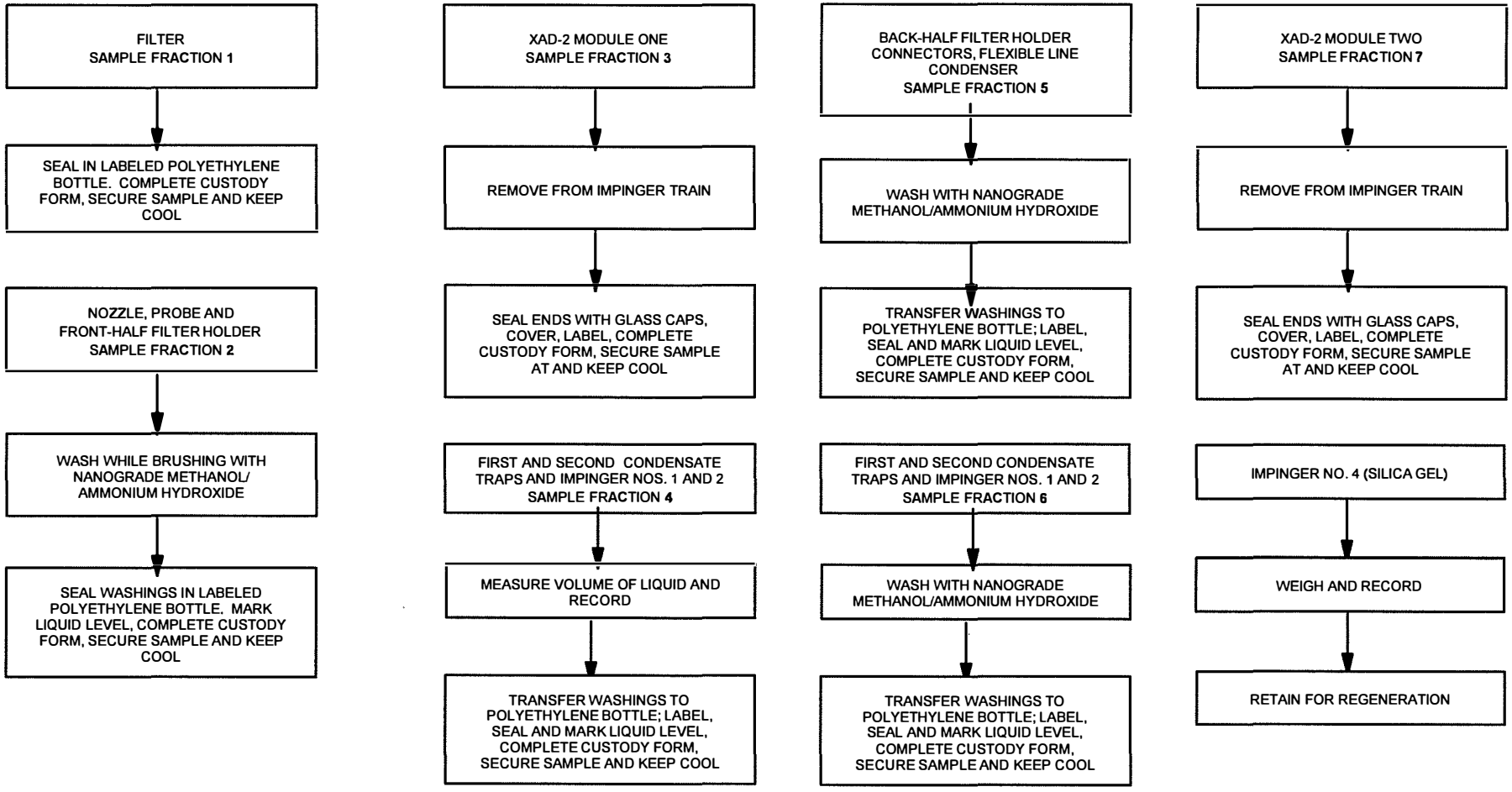


FIGURE 5-2
HFPO DIMER ACID SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

IASDATA\CHEMOURS\15418.002.002\FIGURE 5-2 EPA 0010

5.2.3 EPA Method 0010 – Sample Analysis

Method 0010 sampling trains resulted in four separate analytical fractions for HFPO Dimer Acid analysis according to SW-846 Method 3542:

- Front-Half Composite—comprised of the Particulate Filter, and the probe, nozzle, and front-half of the filter holder solvent rinses,
- Back-half Composite—comprised of the first XAD-2 resin material and the back-half of the filter holder with connecting glassware solvent rinses,
- Condensate Composite—comprised of the aqueous condensates and the contents of Impingers #1 and 2 with solvent rinses,
- Breakthrough XAD-2 Resin Tube—comprised of the resin tube behind the series of impingers.

The second XAD-2 resin material was analyzed separately to evaluate any possible sampling train HFPO-DA breakthrough.

The Front and Back-half composites and the second XAD-2 resin material were placed in polypropylene wide-mouth bottles and tumbled with methanol containing 5% NH_4OH for 18 hours. Portions of the extracts were processed analytically for the HFPO dimer acid by Liquid Chromatography and duel mass spectroscopy (HPLC/MS/MS). The Condensate composite was concentrated onto a solid phase extraction (SPE) cartridge followed by desorption from the cartridge using methanol. Portions of those extracts were also processed analytically by HPLC/MS/MS.

Samples were spiked with isotope dilution internal standard (IDA) at the commencement of their preparation to provide accurate assessments of the analytical recoveries. Final data was corrected for IDA standard recoveries.

Test America developed detailed procedures for the sample extraction and analysis for HFPO Dimer Acid. These procedures were incorporated into the test protocol and are summarized in Appendix C.

5.3 GAS COMPOSITION

The WESTON mobile laboratory equipped with instrumental analyzers was used to measure carbon dioxide (CO_2) and oxygen (O_2) concentrations. A diagram of the WESTON sampling system is presented in Figure 5-3.

The sample was collected at the exhaust of the Method 0010 sampling system. At the end of the line, a tee permitted the introduction of calibration gas. The sample was drawn through a heated Teflon® sample line to the sample conditioner. The output from the sampling system was recorded electronically, and one-minute averages were recorded and displayed on a data logger.

Each analyzer was set up and calibrated internally by introduction of calibration gas standards directly to the analyzer from a calibration manifold. The calibration manifold is designed with an atmospheric vent to release excess calibration gas and maintains the calibration at ambient pressure. The direct calibration sequence consisted of alternate injections of zero and mid-range gases with appropriate adjustments until the desired responses were obtained. The high range standards were then introduced in sequence without further adjustment.

The sample line integrity was verified by performing a bias test before and after each test period. The sampling system bias test consisted of introducing the zero gas and one up range calibration standard in excess to the valve at the probe end when the system was sampling normally. The excess calibration gas flowed out through the probe to maintain ambient sampling system pressure. Calibration gas supply was regulated to maintain constant sampling rate and pressure. Instrument bias check response was compared to internal calibration responses to insure sample line integrity and to calculate a bias correction factor after each run using the ratio of the measured concentration of the bias gas certified by the calibration gas supplier.

The oxygen and carbon dioxide content of each stack gas was measured according to EPA Method 3A procedures which incorporate the latest updates of EPA Method 7E. A Servomex Model 4900 analyzer (or equivalent) was used to measure oxygen content. A Servomex Model 4900 analyzer (or equivalent) was used to measure carbon dioxide content of the stack gas. Both analyzers were calibrated with EPA Protocol gases prior to the start of the test program and performance was verified by sample bias checks before and after each test run.

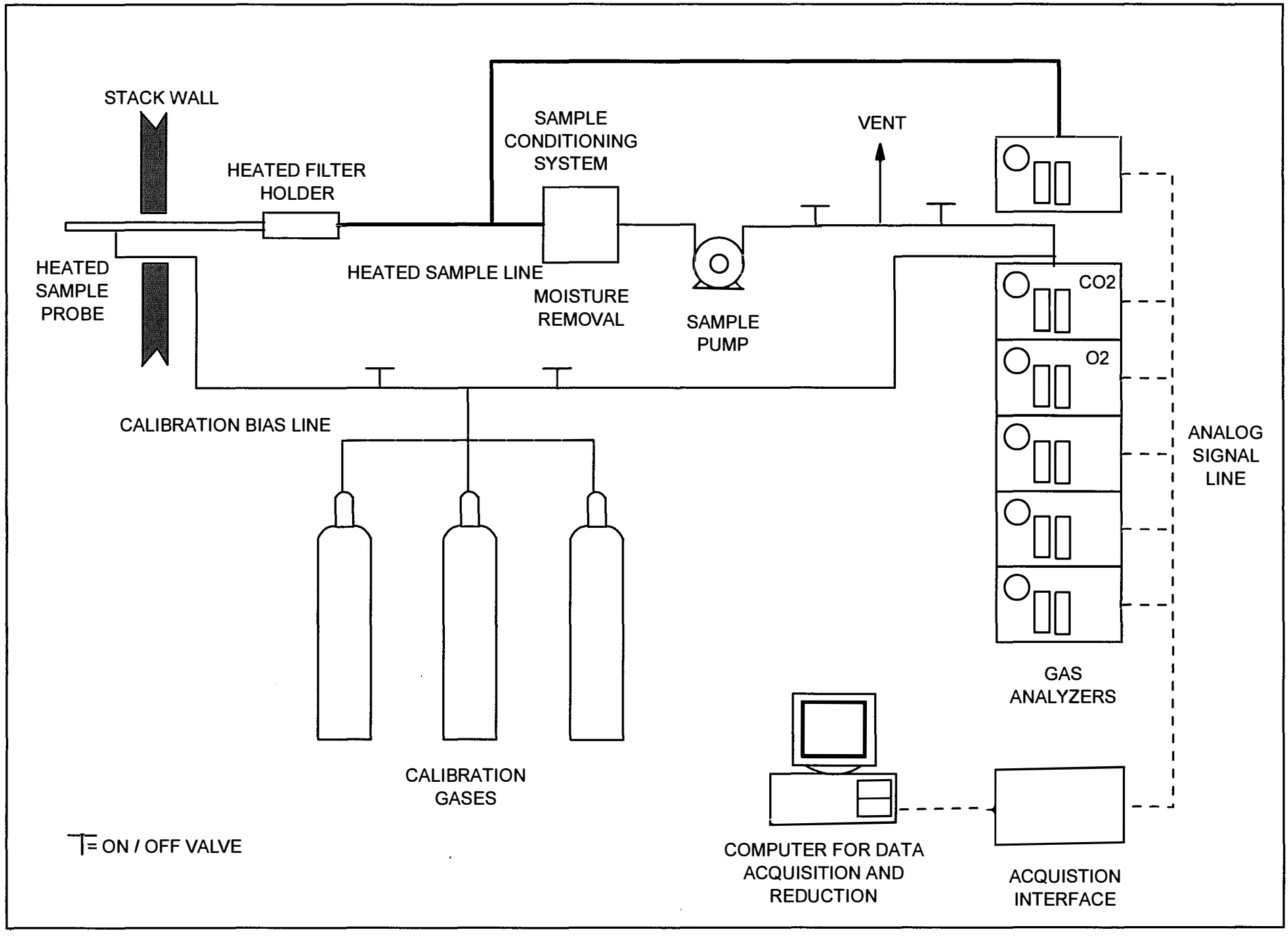


FIGURE 5-3
WESTON SAMPLING SYSTEM

IASDATA\CHEMOURS\15418.002.002\FIGURE 5-3 WESTON SAMPLING SYSTEM

6. DETAILED TEST RESULTS AND DISCUSSION

Preliminary testing and the associated analytical results required significant sample dilution to bring the HFPO Dimer Acid concentration within instrument calibration, therefore, sample times and sample volumes were reduced for the formal test program. This was approved by the North Carolina Department of Environmental Quality (NCDEQ).

Each test was a minimum of 90 minutes in duration. A total of three test runs were performed on the Division Stack. Four test runs (2 during Recycle Still and Polymerization and 2 during Polymerization and Line Four Extrusion) were performed on the Polymers Stack. A total of three tests were performed on the Semi-Works Stack.

Tables 6-1 through 6-4 provide detailed test data and test results for the Division, Polymers and Semi-Works stacks, respectively.

The Method 3A sampling on all sources indicated that the O_2 and CO_2 concentrations were at ambient air levels (20.9% O_2, 0% CO_2), therefore, 20.9% O_2 and 0% CO_2 values were used in all calculations.

TABLE 6-1
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

Test Data			
Run number	1	2	3
Location	Divison	Division	Division
Date	3/19/2018	3/20/2018	3/20/2018
Time period	1613-1808	1002-1219	1355-1544
SAMPLING DATA:			
Sampling duration, min.	90.0	90.0	90.0
Nozzle diameter, in.	0.135	0.135	0.135
Cross sectional nozzle area, sq.ft.	0.000099	0.000099	0.000099
Barometric pressure, in. Hg	29.78	29.46	29.48
Avg. orifice press. diff., in H_2O	0.53	0.52	0.50
Avg. dry gas meter temp., deg F	77.8	67.1	74.3
Avg. abs. dry gas meter temp., deg. R	538	527	534
Total liquid collected by train, ml	21.5	34.5	30.0
Std. vol. of H_2O vapor coll., cu.ft.	1.0	1.6	1.4
Dry gas meter calibration factor	0.9890	0.9890	0.9890
Sample vol. at meter cond., dcf	37.067	36.321	35.683
Sample vol. at std. cond., dscf [(1)]	35.854	35.462	34.389
Percent of isokinetic sampling	101.4	102.1	101.0
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.027	0.044	0.039
Mole fraction of dry gas	0.973	0.956	0.961
Molecular wt. of wet gas, lb/lb mole	28.54	28.36	28.41
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-0.80	-0.80	-0.45
Absolute pressure, in. Hg	29.72	29.40	29.45
Avg. temperature, deg. F	94	84	86
Avg. absolute temperature, deg.R	554	544	546
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	71.6	70.9	69.4
Stack/duct cross sectional area, sq.ft.	7.07	7.07	7.07
Avg. gas stream volumetric flow, wacf/min.	30364	30094	29427
Avg. gas stream volumetric flow, dscf/min.	27945	27446	26907

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-1(cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

TEST DATA			
Run number	1	2	3
Location	Division	Division	Division
Date	3/19/2018	3/20/2018	3/20/2018
Time period	1613-1808	1002-1219	1355-1544
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	1001.5125	204.1430	119.5565
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	986.2	203.2	122.7
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	6.16E-08	1.27E-08	7.66E-09
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	1.03E-01	2.09E-02	1.24E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	1.30E-02	2.63E-03	1.56E-03

TABLE 6-2
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

Test Data

Process Mode	Recycle Still and Polymerization	Recycle Still and Polymerization
Run number	1	2
Location	Polymer	Polymer
Date	3/21/2018	3/21/2018
Time period	1133-1330	1408-1553
SAMPLING DATA:		
Sampling duration, min.	96.0	96.0
Nozzle diameter, in.	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252
Barometric pressure, in. Hg	29.60	29.60
Avg. orifice press. diff., in H_2O	1.21	1.16
Avg. dry gas meter temp., deg F	42.3	43.9
Avg. abs. dry gas meter temp., deg. R	502	504
Total liquid collected by train, ml	24.0	26.8
Std. vol. of H_2O vapor coll., cu.ft.	1.1	1.3
Dry gas meter calibration factor	0.9890	0.9890
Sample vol. at meter cond., dcf	57.188	55.180
Sample vol. at std. cond., dscf [(1)]	58.972	56.715
Percent of isokinetic sampling	99.4	98.1
GAS STREAM COMPOSITION DATA:		
CO_2, % by volume, dry basis	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.019	0.022
Mole fraction of dry gas	0.981	0.978
Molecular wt. of wet gas, lb/lb mole	28.63	28.60
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:		
Static pressure, in. H_2O	-0.24	-0.24
Absolute pressure, in. Hg	29.58	29.58
Avg. temperature, deg. F	48	49
Avg. absolute temperature, deg.R	508	509
Pitot tube coefficient	0.84	0.84
Total number of traverse points	24	24
Avg. gas stream velocity, ft./sec.	40.5	39.7
Stack/duct cross sectional area, sq.ft.	4.91	4.91
Avg. gas stream volumetric flow, wacf/min.	11944	11698
Avg. gas stream volumetric flow, dscf/min.	12036	11726

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-2(cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

TEST DATA		
Process Mode	Recycle Still and Polymerization	Recycle Still and Polymerization
Run number	1	2
Location	Polymer	Polymer
Date	3/21/2018	3/21/2018
Time period	1133-1330	1408-1553
LABORATORY REPORT DATA, ug.		
HFPO Dimer Acid	24.5731	10.6120
EMISSION RESULTS, ug/dscm.		
HFPO Dimer Acid	14.7	6.6
EMISSION RESULTS, lb/dscf.		
HFPO Dimer Acid	9.19E-10	4.13E-10
EMISSION RESULTS, lb/hr.		
HFPO Dimer Acid	6.63E-04	2.90E-04
EMISSION RESULTS, g/sec.		
HFPO Dimer Acid	8.35E-05	3.65E-05

TABLE 6-3
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

Test Data

Process Mode	Polymerization and Line Four Extrusion	Polymerization and Line Four Extrusion
Run number	3	4
Location	Polymer	Polymer
Date	3/22/2018	3/22/108
Time period	0856-1047	1227-1412
SAMPLING DATA:		
Sampling duration, min.	96.0	96.0
Nozzle diameter, in.	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252
Barometric pressure, in. Hg	30.03	30.03
Avg. orifice press. diff., in H_2O	1.20	1.18
Avg. dry gas meter temp., deg F	43.0	55.8
Avg. abs. dry gas meter temp., deg. R	503	516
Total liquid collected by train, ml	14.4	26.7
Std. vol. of H_2O vapor coll., cu.ft.	0.7	1.3
Dry gas meter calibration factor	0.9890	0.9890
Sample vol. at meter cond., dcf	55.975	55.372
Sample vol. at std. cond., dscf [(1)]	58.472	56.406
Percent of isokinetic sampling	98.7	98.0
GAS STREAM COMPOSITION DATA:		
CO_2, % by volume, dry basis	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.011	0.022
Mole fraction of dry gas	0.989	0.978
Molecular wt. of wet gas, lb/lb mole	28.71	28.60
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:		
Static pressure, in. H_2O	-0.24	-0.24
Absolute pressure, in. Hg	30.01	30.01
Avg. temperature, deg. F	49	56
Avg. absolute temperature, deg.R	509	516
Pitot tube coefficient	0.84	0.84
Total number of traverse points	24	24
Avg. gas stream velocity, ft./sec.	39.7	39.5
Stack/duct cross sectional area, sq.ft.	4.91	4.91
Avg. gas stream volumetric flow, wacf/min.	11689	11642
Avg. gas stream volumetric flow, dscf/min.	12021	11679

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-3(cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

TEST DATA		
Process Mode	Polymerization and Line Four Extrusion	Polymerization and Line Four Extrusion
Run number	3	4
Location	Polymer	Polymer
Date	3/22/2018	3/22/108
Time period	0856-1047	1227-1412
LABORATORY REPORT DATA, ug.		
HFPO Dimer Acid	18.13948	19.01
EMISSION RESULTS, ug/dscm.		
HFPO Dimer Acid	11.0	11.9
EMISSION RESULTS, lb/dscf.		
HFPO Dimer Acid	6.84E-10	7.43E-10
EMISSION RESULTS, lb/hr.		
HFPO Dimer Acid	4.93E-04	5.21E-04
EMISSION RESULTS, g/sec.		
HFPO Dimer Acid	6.21E-05	6.56E-05

TABLE 6-4
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

Test Data			
Run number	1	2	3
Location	Semi-Works	Semi-Works	Semi-Works
Date	3/23/2018	3/23/2018	3/23/2018
Time period	0852-1041	1157-1341	1425-1609
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.235	0.235	0.235
Cross sectional nozzle area, sq.ft.	0.000301	0.000301	0.000301
Barometric pressure, in. Hg	30.29	30.29	30.21
Avg. orifice press. diff., in H_2O	1.26	1.33	1.35
Avg. dry gas meter temp., deg F	58.0	72.7	79.7
Avg. abs. dry gas meter temp., deg. R	518	533	540
Total liquid collected by train, ml	17.3	21.5	22.2
Std. vol. of H_2O vapor coll., cu.ft.	0.8	1.0	1.0
Dry gas meter calibration factor	0.9890	0.9890	0.9890
Sample vol. at meter cond., dcf	58.024	60.895	60.905
Sample vol. at std. cond., dscf [(1)]	59.371	60.601	59.677
Percent of isokinetic sampling	98.9	100.2	99.2
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.014	0.016	0.017
Mole fraction of dry gas	0.986	0.984	0.983
Molecular wt. of wet gas, lb/lb mole	28.69	28.66	28.65
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-0.25	-0.25	-0.25
Absolute pressure, in. Hg	30.27	30.27	30.19
Avg. temperature, deg. F	61	66	70
Avg. absolute temperature, deg.R	521	526	530
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	16	16	16
Avg. gas stream velocity, ft./sec.	34.2	34.9	35.1
Stack/duct cross sectional area, sq.ft.	3.98	3.98	3.98
Avg. gas stream volumetric flow, wacf/min.	8162	8334	8377
Avg. gas stream volumetric flow, dscf/min.	8254	8315	8276

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-4(cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS

TEST DATA			
Run number	1	2	3
Location	Semi-Works	Semi-Works	Semi-Works
Date	3/23/2018	3/23/2018	3/23/2018
Time period	0852-1041	1157-1341	1425-1609
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	39.8276	52.88853	161.20
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	23.7	30.8	95.4
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	1.48E-09	1.92E-09	5.96E-09
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	7.32E-04	9.60E-04	2.96E-03
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	9.22E-05	1.21E-04	3.72E-04

APPENDIX A
PROCESS OPERATIONS DATA

Division

Date	3/19/2018
Time	1400 | 1500 | 1600 | 1700 | 1800 | 1900
Stack Testing	1613-1808 (Run 1)
HFPO	
VEN Product	PSEPVE
VEN Precursor	
VEN Condensation (HFPO)	
VEN ABR	Burnout
VEN Refining	Batch
Division WGS Recirculation Flow	

Date	3/20/2018
Time	800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700
Stack Testing	1002-1219 (RUN 2) | 1355-1544 (RUN 3)
HFPO	
VEN Product	PSEPVE
VEN Precursor	
VEN Condensation (HFPO)	
VEN ABR	
VEN Refining	
Division WGS Recirculation Flow	

Polymers

Date	3/21/2018																															
Time	900				1000				1100			1200				1300				1400				1500				1600				
Stack Testing											1133-1330 (Run 1) -recycle still									1408-1553 Run 2 - recycle still												
Recycle Still	Crude E2 Distillation																															
Polymerization	Standard SR Polymer Production																															
Line 4 Extrusion																																

Date	3/20/2018																																							
Time	600				700				800			900				1000				1100				1200				1300				1400									
Stack Testing												856-1047 Run 1 - Line 4 Extrusion												1227-1412 Run 2 - Line 4 Extrusion															
Recycle Still																																								
Polymerization	Standard SR Polymer Production																																							
Line 4 Extrusion																																								

Semiworks

Date 3/23/2018

Time	700	800	900	1000	1100	1200	1300	1400	1500	1600
Stack Testing		0856-1047 RUN 1				1157-1341 RUN 2		1425-1609 RUN 3		
HFPO DP Production		HFPO DP Batch Run				HFPO DP Batch Run			HFPO DP Batch Run	

APPENDIX B
RAW AND REDUCED TEST DATA

Sample and Velocity Traverse Point Data Sheet - Method 1

Client: CHEMOURS
Loaction/Plant: Fayetteville, N.C.
Source: Division Stack

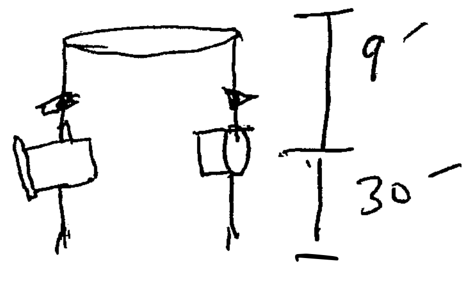
Operator: MW/KS
Date: 1/22/18
W.O. Number: 15418.002.002

Duct Type	☒	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☒	Particulate Traverse	☐	Velocity Traverse	☐ CEM Traverse

Distance from far wall to outside of port (in.) = C	55
Port Depth (in.) = D	18 1/4
Depth of Duct, diameter (in.) = C-D	36 3/4
Area of Duct (ft²) 3/07/18 7.07 MW	~~7.066~~
Total Traverse Points	12
Total Traverse Points per Port	6
Port Diameter (in.) —(Flange-Threaded-Hole)	4"
Monorail Length	8'
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	/
Total Ports (rectangular duct only)	/
Equivalent Diameter = (2*L*W)/(L+W)	/

Flow Disturbances	
Upstream - A (ft)	9'
Downstream - B (ft)	30'
Upstream - A (duct diameters)	[illegible]
Downstream - B (duct diameters)	[illegible]

Diagram of Stack



Traverse Point Locations

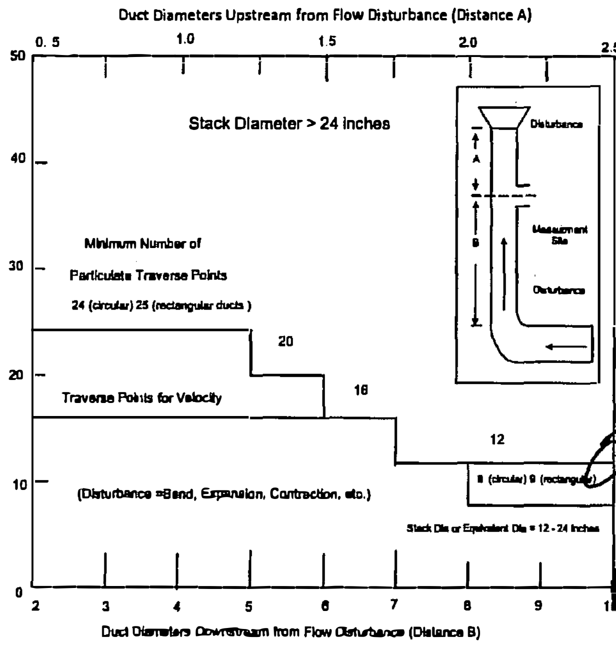
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	4.4	1.62	~~19 3/8~~ 20 1/8
2	14.6	5.40	~~23 3/4~~ 24 3/8
3	29.6	10.95	~~28 7/8~~ 29 7/16
4	70.4	26.04	~~44.0~~ 45
5	85.4	31.59	~~49 3/8~~ 50 3/16
6	95.6	35.37	~~53 3/4~~ 54 3/16
7			
8			
9			
10			
11			
12			

MW

CEM 3 Point(Long Measurment Line) Stratification Point Locations

1	0.167		
2	0.50		
3	0.833		

Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall



Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

WESTON

Determination of Stack Gas Velocity - Method 2

Client: Chemours
Location/Plant: Fayetteville, NC.
Source: Division Stack

Operator: MW / KS
Date: 1/24/18
W.O. Number: 15418.002.004

Pitot Coeff (Cp): 0.84
Stack Area, ft² (As): ~~7.46~~ 7.07 MPW 3/08/23
Pitot Tube/Thermo ID: P696

Run Number	1		
Time	1450-1520		
Barometric Press, in Hg (Pb)	30.19		
Static Press, in H_20 (Pstatic)	-0.64		
Source Moisture, % (BWS)	1.5		
O_2, %	20.9		
CO_2, %	0.1		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? (Y) / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0	0	A	1	1.2	80				
0	0		2	1.2	80				
0	0		3	1.4	83				
0	0		4	1.6	84				
0	0		5	1.4	85				
0	0		6	1.4	85				
0	0	B	1	1.1	83				
0	0		2	1.2	83				
0	0		3	1.4	84				
0	0		4	1.6	85				
0	0		5	1.6	85				
0	0		6	1.4	86				
Avg Angle	0	Avg Delta P & Temp		1.3750	83.5				
		avg $\sqrt{\text{DeltaP}}$		1.17049					
		Average gas stream velocity, ft/sec.							
		Vol. flow rate @ actual conditions, wacf/min							
		Vol. flow rate at standard conditions, dscf/min							

$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$

$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

$Vs = 85.49 * Cp * avg \sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$

$Qs(act) = 60 * Vs * As$

$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$

where:
MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual, wacf/min
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

WESTON

Comments ______

method2.xls

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS

Test Data			
Run number	1	2	3
Location	Divison	Division	Divison
Date	3/19/2018	3/20/2018	3/20/2018
Time period	1613-1808	1002-1219	1355-1544
Operator	MW	MW	MW
Inputs For Calcs.			
Sq. rt. delta P	1.23333	1.22337	1.19609
Delta H	0.5342	0.5192	0.5042
Stack temp. (deg.F)	94.0	83.8	85.7
Meter temp. (deg.F)	77.8	67.1	74.3
Sample volume (act.)	37.067	36.321	35.683
Barometric press. (in.Hg)	29.78	29.46	29.48
Volume H_2O imp. (ml)	8.0	20.0	16.0
Weight change sil. gel (g)	13.5	14.5	14.0
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	7.070	7.070	7.070
Sample time (min.)	90.0	90.0	90.0
Static pressure (in.H_2O)	-0.80	-0.80	-0.45
Nozzle dia. (in.)	0.135	0.135	0.135
Meter box cal.	0.9890	0.9890	0.9890
Cp of pitot tube	0.84	0.84	0.84
Traverse points	12	12	12

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

			Stack Conditions							
Client	Chemours		Assumed	Actual	Meter Box ID	30				
W.O.#	15418.002.002.0001				Meter Box Y	0.9890			K Factor	0.352
Project ID	Chemours	% Moisture	2A		Meter Box Del H	1.9077	**Leak Checks**	Initial	Mid-Point	Final
Mode/Source ID	Division	Impinger Vol (ml)		8	Probe ID / Length	P695 / 7'	Sample Train (ft^3)	0.001	0.001	0.005
Samp. Loc. ID	STK	Silica gel (g)		13.5	Probe Material	Boro	Leak Check @ (in Hg)	≤3	≤3	≤3
Run No.ID	1	CO2, % by Vol	0.0	0.0	Pitot / Thermocouple ID	P695 / P695	Pitot good	(yes) / no	(yes) / no	(yes) / no
Test Method ID	M0010	O2, % by Vol	20.9	20.9	Pitot Coefficient	0.84	Orsat good	(yes) / no	(yes) / no	(yes) / no
Date ID	19MAR2018	Temperature (°F)	≈93		Nozzle ID	G135	**Temp Check**	Pre-Test Set		Post-Test Set
Source/Location	Division Stack	Meter Temp (°F)	78		Avg Nozzle Dia (in)	0.135	Meter Box Temp	70		69
Sample Date	3/19/18	Static Press (in H_2O)	-0.80	-0.80	Area of Stack (ft^2)	7.07	Reference Temp	69		69
Baro. Press (in Hg)	29.78				Sample Time	90	Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
Operator	MD MATT WINKLER	Ambient Temp (°F)	67		Total Traverse Pts	12	Temp Change Response	(yes) / no		(yes) / no

TRAVERSE POINT NO.		SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
		0	1613			281.000									
A	1	7.5		1.6	0.56	284.16	92	NA	78	100	103	66	2	55	
	2	15.0		1.7	0.59	287.44	93		78	100	98	63	2	63	
	3	22.5		1.7	0.60	290.71	93		78	107	102	55	2	54	
	4	30.0		1.5	0.53	293.80	94		78	109	110	53	2	51	18,694
	5	37.5		1.4	0.49	296.80	94		79	110	108	52	2	52	
	6	45.0	1658	1.3	0.45	299.645	94	↓	79	110	110	51	2	51	
			1723			299.821		NA	78	MW 3					
B	1	7.5		1.4	0.49	302.21	94		40	110	110	62	2	62	
	2	15.0		1.6	0.56	305.94	94		78	110	113	55	2	54	18.423
	3	22.5		1.7	0.60	309.14	95		79	110	110	54	2	54	
	4	30.0	MD	~~1.7~~ 1.7	0.60	312.46	95		77	110	112	51	2	50	
	5	37.5		1.4	0.49	315.43	95		76	110	110	49	2	49	
	6	45.0	1806	1.3	0.45	318.243	95	↓	76	110	112	50	2	49	
				Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts		Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				1.23333	0.53418	37.067	94		77.8	110	113	66	2	62	
					Avg Sqrt Del H	Comments:									
					0.72985										

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

			Stack Conditions				
Client	Chemours		Assumed	Actual	Meter Box ID	30	
W.O.#	15418.002.002.0001				Meter Box Y	0.9890	
Project ID	Chemours	% Moisture	2.8		Meter Box Del H	1.9077	
Mode/Source ID	Division	Impinger Vol (ml)		70	Probe ID / Length	P693	
Samp. Loc. ID	STK	Silica gel (g)		14.5	Probe Material	Boro	
Run No.ID	2	CO2, % by Vol	0.1	0	Pitot / Thermocouple ID	P693	P693
Test Method ID	M0010	O2, % by Vol	20.8	20.9	Pitot Coefficient	0.84	
Date ID	19MAR2018	Temperature (°F)	94		Nozzle ID	G135	
Source/Location	Division Stack	Meter Temp (°F)	61		Avg Nozzle Dia (in)	0.135	
Sample Date	3/20/18	Static Press (in H_2O)	-0.80	-0.80	Area of Stack (ft²)	7.07	
Baro. Press (in Hg)	29.46				Sample Time	90	
Operator	MP, MATT WINKELER	Ambient Temp (°F)	64		Total Traverse Pts	12	

K Factor 0.343

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.001	0.0015
Leak Check @ (in Hg)	@12	@3	@4
Pitot good	(yes) / no	(yes) / no	(yes) / no
Orsat good	(yes) / no	(yes) / no	(yes) / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	64	72
Reference Temp	63	71
Pass/Fail (+/- 2°)	(Pass) / Fail	(Pass) / Fail
Temp Change Response	yes / no	(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1002	MPW		320.305			MPW						
B 1	7.5 MPW	~~1015~~	~~0.51~~ 1.5	0.51	323.11	82	NA	66	110	110	64	2	64	
2	15.0 MPW	~~1016~~	1.6	0.54	326.26	82	↓	66	112	112	64	2	64	
3	22.5	*	1.6	0.56	329.39	82		66	110	112	64	2	64	← 0.350
4	30.0		1.5	0.52	332.50	82		66	110	109	63	2	63	K-FACTOR
5	37.5	MPW	1.3	0.45	335.20	83		66	110	107	61	2	61	17.696
6	45.0	~~1047~~	1.3	0.45	338.001	83	↓	66	110	110	60	2	59	
		1115												
		1134			338.145			62 MPW						
A 1	7.5		1.7	0.59	341.45	84	NA	~~72~~	111	110	67	2	67	
2	15.0		1.7	0.59	344.64	85	↓	~~58~~ 65 MPW	112	115	61	2	61	18.625
3	22.5		1.6	0.56	347.91	85		68	110	109	56	2	56	
4	30.0		1.5	0.52	351.05	85		70	110	109	55	2	55	
5	37.5		1.4	0.49	353.83	86		72	110	109	55	2	55	
6	45.0	1219	1.3	0.45	356.770	86		72	110	110	55	2	55	

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
1.22336	0.519161	36.321	83.8	67.1	112	115	67	2	67

Avg Sqrt Del H: 0.71971

Comments:

EPA Method 0010 from EPA SW-846

~~*1016~~

WESTON SOLUTIONS

* 1026 STOP RESTART @ 1055

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions	Assumed	Actual
Client	Chemours	% Moisture	2.7	
W.O.#	15418.002.002.0001	Impinger Vol (ml)		16
Project ID	Chemours	Silica gel (g)		14
Mode/Source ID	Division	CO2, % by Vol	0	0
Samp. Loc. ID	STK	O2, % by Vol	20.8	20.9
Run No.ID	3	Temperature (°F)	84	
Test Method ID	M0010	Meter Temp (°F)	72	
Date ID	19MAR2018	Static Press (in H_2O)	-0.80	-0.45
Source/Location	Division Stack			
Sample Date	3/20/18			
Baro. Press (in Hg)	29.48			
Operator	MB MATT WINKLER	Ambient Temp (°F)	77	

Meter Box ID	30
Meter Box Y	0.9890
Meter Box Del H	1.9077
Probe ID / Length	P6934 7'
Probe Material	Boro
Pitot / Thermocouple ID	P6934 P6934
Pitot Coefficient	0.84
Nozzle ID	G135
Avg Nozzle Dia (in)	0.135
Area of Stack (ft^2)	7.07
Sample Time	90
Total Traverse Pts	12

K Factor 0.356

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft^3)	0.001	0.001	0.003
Leak Check @ (in Hg)	≤5	≤4	≤4
Pitot good	(yes) / no	(yes) / no	(yes) / no
Orsat good	(yes) / no	(yes) / no	(yes) / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	72	70
Reference Temp	72	70
Pass/Fail (+/- 2°)	(Pass) / Fail	(Pass) / Fail
Temp Change Response	(yes) / no	(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1355			357.291									
B 1	7.5		1.3	0.45	360.19	87	NA	78	110	111	67	2	66	
2	15.0		1.6	0.56	363.29	87		78	111	111	62	2	62	17.764
3	22.5		1.5	0.53	366.51	87		75	111	110	61	2	61	
4	30.0		1.5	0.53	369.38	87		74	111	112	60	2	60	
5	37.5		1.3	0.45	372.19	87		74	112	113	59	2	58	
6	45.0	1440	1.3	0.45	375.055	87		74	110	110	58	2	58	
		1459			375.135		NA							
A 1	7.5		1.5	0.53	378.20	84		74	112	112	64	2	64	≤0.355
2	15.0		1.6	0.57	381.39	84		74	110	113	59	2	59	← K Factor
3	22.5		1.6	0.57	384.47	85		73	110	110	57	2	57	
4	30.0		1.4	0.49	387.44	85		73	110	110	57	2	57	17.919
5	37.5		1.3	0.46	390.32	85		73	109	110	58	2	58	
6	45.0	1544	1.3	0.46	393.054	83		72	111	111	58	2	58	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts		Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			1.19608	0.504	35.683	85.67		74.3	112	113	67	2	60	
				Avg Sqrt Del H										
				0.7092										

Comments:

EPA Method 0010 from EPA SW-846

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Location	Division Stack

Run No. 1 — Sample Date 3/19/18 — Recovery Date 3/12/18

Sample I.D. Chemours - Division - STK - 1 - M0010 - — Analyst PMM — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	2	101	103	2					713.5	
Initial	0	100	100	0					300	
Gain	2	1	3	2				8	13.5	26.5

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 2 — Sample Date 3/19/18 — Recovery Date 3/20/18

Sample I.D. Chemours - Division - STK - 2 - M0010 - — Analyst PMM — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	6	103	103	8					714.5	
Initial	0	100	100	0					300	
Gain	6	3	3	8				20	14.5	34.5

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 3 — Sample Date 3/19/18 — Recovery Date 3/20/18

Sample I.D. Chemours - Division - STK - 3 - M0010 - — Analyst PMM — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	3	100	109	4					714	
Initial	0	100	100	0					300	
Gain	3	0	9	4				16	14	30

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Loaction	Division Stack

Run No. BT Sample Date 3/20/18 Recovery Date 3/21/18

Sample I.D. Chemours - Division - STK - BT - M0010 - 19MAR2018 Analyst [illegible] Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	0	100	100	0					300	
Initial	0	100	100	0					300	
Gain	0	0	0	0				0	0	0

Impinger Color Clear Labeled? ✓

Silica Gel Condition Good Sealed? ✓

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. ___ Analyst ___ Filter Number ___

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color ___ Labeled? ___

Silica Gel Condition ___ Sealed? ___

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. ___ Analyst ___ Filter Number ___

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color ___ Labeled? ___

Silica Gel Condition ___ Sealed? ___

Check COC for Sample IDs of Media Blanks

METHODS AND ANALYZERS

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Project Number:
Operator: **SR**
Date: **19 Mar 2018**

File: C:\DATA\JMI Devon\March 2018\031918divisionr1.cem
Program Version: 2.1, built 19 May 2017 **File Version:** 2.02
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Project Number:
Operator: **SR**
Date: **19 Mar 2018**

Start Time: 14:07

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC351431
21.0	SG9169108

Calibration Results

Zero	-3 mv
Span, 21.0 %	8007 mv

Curve Coefficients

Slope	**Intercept**
381.4	-3

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC351431
16.6	SG9169108

Calibration Results

Zero	3 mv
Span, 16.6 %	8302 mv

Curve Coefficients

Slope	**Intercept**
500.5	3

CALIBRATION ERROR DATA

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **19 Mar 2018**

Start Time: 14:07

O_2

Method: EPA 3A

Span Conc. 21.0 %

Slope 381.4 **Intercept** -3.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Slope 500.5 **Intercept** 3.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **19 Mar 2018**

Start Time: 14:14

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

RUN DATA

Number 1

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **19 Mar 2018**

Time	O_2 %	CO_2 %
16:14	20.7	0.0
16:15	20.7	0.0
16:16	20.7	0.0
16:17	20.7	0.0
16:18	20.7	0.0
16:19	20.7	0.0
16:20	20.7	0.0
16:21	20.7	0.0
16:22	20.7	0.0
16:23	20.7	0.0
16:24	20.7	0.0
16:25	20.7	0.0
16:26	20.7	0.0
16:27	20.7	0.0
16:28	20.7	0.1
16:29	20.7	0.1
16:30	20.7	0.1
16:31	20.7	0.1
16:32	20.7	0.1
16:33	20.7	0.1
16:34	20.7	0.1
16:35	20.7	0.1
16:36	20.7	0.1
16:37	20.7	0.1
16:38	20.7	0.1
16:39	20.7	0.1
16:40	20.7	0.1
16:41	20.7	0.1
16:42	20.7	0.1
16:43	20.7	0.1
16:44	20.7	0.1
16:45	20.7	0.1
16:46	20.7	0.1
16:47	20.7	0.1
16:48	20.7	0.1
16:49	20.7	0.1
16:50	20.7	0.1
16:51	20.7	0.1
16:52	20.7	0.1
16:53	20.7	0.1

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Calibration **1**

Project Number:
Operator: **SR**
Date: **19 Mar 2018**

Time	O_2 %	CO_2 %
16:54	20.7	0.1
16:55	20.7	0.1
16:56	20.7	0.1
16:57	20.7	0.1
16:58	20.7	0.1
17:24	20.7	0.1
17:25	20.7	0.1
17:26	20.7	0.1
17:27	20.7	0.1
17:28	20.7	0.1
17:29	20.7	0.1
17:30	20.7	0.1
17:31	20.7	0.1
17:32	20.7	0.1
17:33	20.7	0.1
17:34	20.7	0.1
17:35	20.7	0.1
17:36	20.7	0.1
17:37	20.7	0.1
17:38	20.7	0.1
17:39	20.7	0.1
17:40	20.7	0.1
17:41	20.7	0.1
17:42	20.7	0.1
17:43	20.7	0.1
17:44	20.7	0.1
17:45	20.7	0.1
17:46	20.7	0.1
17:47	20.7	0.1
17:48	20.7	0.1
17:49	20.7	0.1
17:50	20.7	0.1
17:51	20.8	0.1
17:52	20.8	0.1
17:53	20.8	0.1
17:54	20.8	0.1
17:55	20.8	0.1
17:56	20.8	0.1
17:57	20.8	0.1
17:58	20.8	0.1

RUN DATA

Number 1

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **19 Mar 2018**

Time	O_2 %	CO_2 %
17:59	20.8	0.0
18:00	20.8	0.0
18:01	20.8	0.0
18:02	20.8	0.0
18:03	20.8	0.0
18:04	20.8	0.0
18:05	20.8	0.0
18:06	20.8	0.0
18:07	20.8	0.0
18:08	20.8	0.0
Avgs	**20.7**	**0.1**

RUN SUMMARY

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **19 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 16:13 to 18:08

Run Averages

20.7	0.1

Pre-run Bias at 14:14

Zero Bias	0.1	0.1
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 19:05

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.8	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **19 Mar 2018**

Start Time: 19:05

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.6	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 1

METHODS AND ANALYZERS

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Date: **20 Mar 2018**

c\IASData\Client Folders.A-F\Chemours\15418.002.002 Fayetteville 2018 Stack Testing\Data\Week of March 19th\0

Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Project Number:
Operator: **SR**
Date: **20 Mar 2018**

Start Time: 07:47

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC351431
21.0	SG9169108

Calibration Results

Zero	8 mv
Span, 21.0 %	8012 mv

Curve Coefficients

Slope	**Intercept**
381.1	8

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC351431
16.6	SG9169108

Calibration Results

Zero	15 mv
Span, 16.6 %	8293 mv

Curve Coefficients

Slope	**Intercept**
499.3	15

CALIBRATION ERROR DATA

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **20 Mar 2018**

Start Time: 07:47

O_2

Method: EPA 3A

Span Conc. 21.0 %

Slope 381.1 **Intercept** 8.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Slope 499.3 **Intercept** 15.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **20 Mar 2018**

Start Time: 07:53

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Calibration **1**

Project Number:
Operator: **SR**
Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
10:03	20.8	0.0
10:04	20.7	0.0
10:05	20.7	0.0
10:06	20.7	0.0
10:07	20.7	0.0
10:08	20.7	0.0
10:09	20.7	0.1
10:10	20.7	0.1
10:11	20.7	0.1
10:12	20.7	0.0
10:13	20.7	0.1
10:14	20.7	0.0
10:15	20.7	0.0
10:16	20.7	0.0
10:17	20.7	0.0
10:18	20.7	0.0
10:19	20.7	0.0
10:20	20.7	0.0
10:21	20.7	0.0
10:22	20.7	0.0
10:23	20.7	0.0
10:24	20.7	0.0
10:25	20.7	0.0
10:26	20.7	0.0
10:27	20.7	0.0
10:28	20.8	0.0
10:29	20.8	0.0
10:30	20.8	0.0
10:31	20.8	0.0
10:32	20.8	0.0
10:33	20.8	0.0
10:34	20.8	0.0
10:35	20.8	0.0
10:36	20.8	0.0
10:37	20.8	0.0
10:38	20.8	0.0
10:39	20.8	0.0
10:40	20.8	0.0
10:41	20.8	0.0
10:42	20.8	0.0

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Calibration **1**

Project Number:
Operator: **SR**
Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
10:43	20.8	0.0
10:44	20.8	0.0
10:45	20.8	0.0
10:46	20.8	0.0
10:47	20.8	0.0
10:48	20.8	0.0
10:49	20.8	0.0
10:50	20.8	0.0
10:51	20.8	0.0
10:52	20.8	0.0
10:53	20.8	0.0
10:54	20.8	0.0
10:55	20.7	0.0
10:56	20.7	0.0
10:57	20.7	0.0
10:58	20.7	0.0
10:59	20.7	0.0
11:00	20.7	0.0
11:01	20.7	0.0
11:02	20.7	0.0
11:03	20.7	0.0
11:04	20.7	0.0
11:05	20.7	0.0
11:06	20.7	0.0
11:07	20.7	0.0
11:08	20.7	0.0
11:09	20.7	0.0
11:10	20.7	0.0
11:11	20.7	0.0
11:12	20.7	0.0
11:13	20.7	0.0
11:14	20.7	0.0
11:15	20.7	0.0
11:35	20.7	0.0
11:36	20.7	0.0
11:37	20.7	0.0
11:38	20.7	0.0
11:39	20.7	0.0
11:40	20.7	0.0
11:41	20.7	0.0

RUN DATA

Number 2

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
11:42	20.7	0.0
11:43	20.7	0.0
11:44	20.7	0.0
11:45	20.7	0.0
11:46	20.7	0.0
11:47	20.7	0.0
11:48	20.7	0.0
11:49	20.7	0.0
11:50	20.7	0.0
11:51	20.7	0.0
11:52	20.7	0.0
11:53	20.7	0.0
11:54	20.7	0.0
11:55	20.7	0.0
11:56	20.7	0.0
11:57	20.7	0.0
11:58	20.7	0.0
11:59	20.7	0.0
12:00	20.7	0.0
12:01	20.7	0.0
12:02	20.7	0.1
12:03	20.7	0.1
12:04	20.7	0.0
12:05	20.7	0.1
12:06	20.7	0.1
12:07	20.7	0.1
12:08	20.7	0.1
12:09	20.7	0.1
12:10	20.7	0.1
12:11	20.7	0.1
12:12	20.8	0.1
12:13	20.8	0.1
12:14	20.8	0.1
12:15	20.8	0.1
12:16	20.8	0.1
12:17	20.8	0.1
12:18	20.8	0.1
12:19	20.8	0.1
Avgs	**20.7**	**0.0**

RUN SUMMARY

Number 2

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **20 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 10:02 to 12:19

Run Averages

20.7 0.0

Pre-run Bias at 07:53

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 12:55

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.7 0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **20 Mar 2018**

Start Time: 12:55

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 1

RUN DATA

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
13:56	20.7	0.1
13:57	20.7	0.1
13:58	20.7	0.0
13:59	20.7	0.1
14:00	20.7	0.1
14:01	20.7	0.1
14:02	20.7	0.1
14:03	20.7	0.1
14:04	20.7	0.1
14:05	20.7	0.1
14:06	20.7	0.1
14:07	20.7	0.1
14:08	20.7	0.1
14:09	20.7	0.1
14:10	20.7	0.1
14:11	20.7	0.1
14:12	20.7	0.1
14:13	20.7	0.1
14:14	20.7	0.1
14:15	20.8	0.1
14:16	20.8	0.1
14:17	20.8	0.1
14:18	20.8	0.1
14:19	20.8	0.1
14:20	20.8	0.1
14:21	20.8	0.0
14:22	20.8	0.1
14:23	20.8	0.0
14:24	20.8	0.0
14:25	20.8	0.0
14:26	20.8	0.0
14:27	20.8	0.0
14:28	20.8	0.0
14:29	20.8	0.0
14:30	20.8	0.0
14:31	20.9	0.0
14:32	20.9	0.0
14:33	20.9	0.0
14:34	20.9	0.0
14:35	20.9	0.0

RUN DATA

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
14:36	20.9	0.0
14:37	20.9	0.0
14:38	20.9	0.0
14:39	20.9	0.0
14:40	20.9	0.0
15:00	20.7	0.0
15:01	20.7	0.0
15:02	20.7	0.0
15:03	20.7	0.0
15:04	20.7	0.0
15:05	20.7	0.0
15:06	20.7	0.0
15:07	20.7	0.0
15:08	20.7	0.0
15:09	20.7	0.0
15:10	20.7	0.0
15:11	20.7	0.0
15:12	20.7	0.0
15:13	20.8	0.0
15:14	20.8	0.0
15:15	20.8	0.0
15:16	20.8	0.0
15:17	20.8	0.0
15:18	20.8	0.0
15:19	20.8	0.0
15:20	20.8	0.0
15:21	20.8	0.0
15:22	20.8	0.0
15:23	20.8	0.0
15:24	20.8	0.1
15:25	20.8	0.1
15:26	20.8	0.1
15:27	20.8	0.1
15:28	20.8	0.1
15:29	20.8	0.1
15:30	20.9	0.1
15:31	20.8	0.1
15:32	20.8	0.1
15:33	20.8	0.1
15:34	20.8	0.1

RUN DATA

Number 3

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Division Stack**

Calibration **1**

Project Number:
Operator: **SR**
Date: **20 Mar 2018**

Time	O_2 %	CO_2 %
15:35	20.9	0.1
15:36	20.9	0.1
15:37	20.9	0.1
15:38	20.9	0.1
15:39	20.9	0.1
15:40	20.9	0.1
15:41	20.9	0.1
15:42	20.9	0.1
15:43	20.9	0.1
15:44	20.9	0.1
Avgs	**20.8**	**0.1**

RUN SUMMARY

Number 3

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division Stack** Calibration **1** Date: **20 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 13:55 to 15:44

Run Averages

20.8 0.1

Pre-run Bias at 12:55

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 16:14

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.8 0.1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Division Stack** | Calibration **1** | Date: **20 Mar 2018**

Start Time: 16:14

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 2

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 2

Sample and Velocity Traverse Point Data Sheet - Method 1

Client Chemours — Operator SR

Loaction/Plant Fayetteville — Date 3/21/18

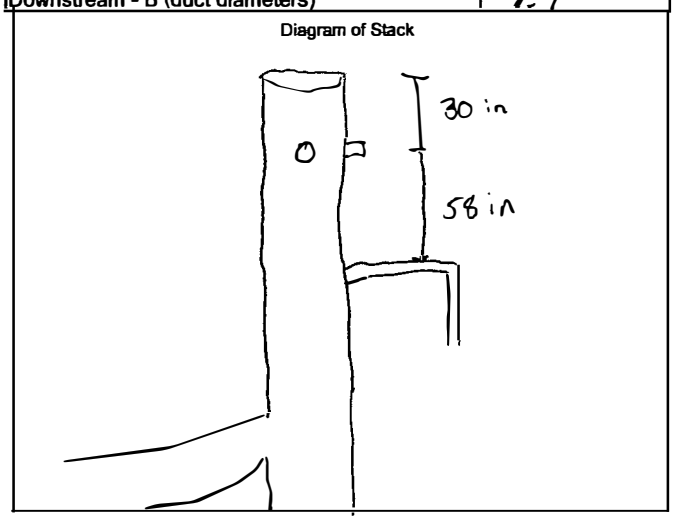
Source Polymers — W.O. Number

Duct Type	☐ Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐ Particulate Traverse	☐	Velocity Traverse	☐ CEM Traverse

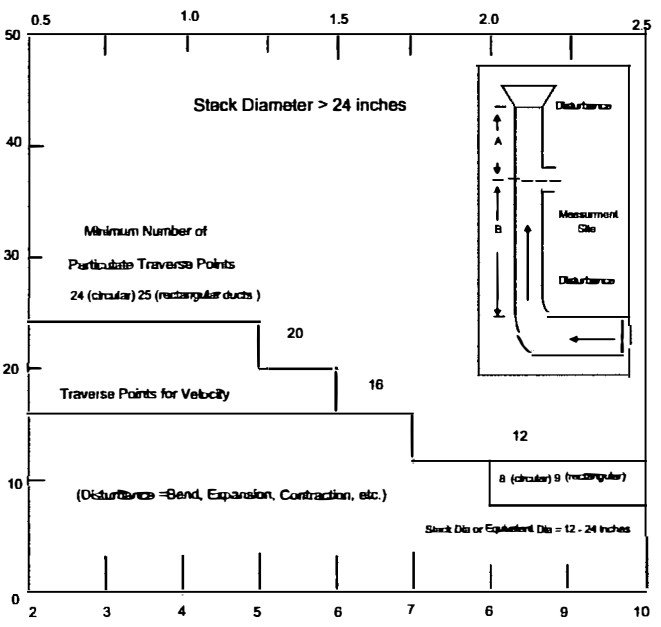
Distance from far wall to outside of port (in.) = C	48
Port Depth (in.) = D	18
Depth of Duct, diameter (in.) = C-D	30
Area of Duct (ft²)	4.91
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) —(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Flow Disturbances	
Upstream - A (ft)	2.5
Downstream - B (ft)	4.83
Upstream - A (duct diameters)	1.0
Downstream - B (duct diameters)	1.9

Diagram of Stack



Duct Diameters Upstream from Flow Disturbance (Distance A)



Duct Diameters Downstream from Flow Disturbance (Distance B)

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	2.1	1	19
2	6.7	2	20
3	11.8	3 1/2	21 1/2
4	17.7	5 1/4	23 1/4
5	25	7 1/2	25 1/2
6	35.6	10 5/8	28 5/8
7	64.4	19 3/8	37 3/8
8	75	22 1/2	40 1/2
9	82.3	24 3/4	42 3/4
10	88.2	26 1/2	44
11	93.3	28	46
12	97.9	29	47
CEM 3 Point(Long Measurment Line) Stratification Point Locations			
1	0.167		
2	0.50		
3	0.833		

Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall

Traverse Point Location Percent of Stack -Circular

Traverse Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Determination of Stack Gas Velocity - Method 2

Client: Chemours | Operator: MW/KS | Pitot Coeff (Cp): 0.84
Location/Plant: Fayetteville, N.C. | Date: 3/21/17 | Stack Area, ft² (As): 4.91
Source: Polymon Stack | W.O. Number: 10418.001.002.0001 | Pitot Tube/Thermo ID: 697

Run Number	1		
Time	1029 – 1045		
Barometric Press, in Hg (Pb)	29.60		
Static Press, in H_2O (Pstatic)	-0.20		
Source Moisture, % (BWS)	≈2.0		
O_2, %	0.1		
CO_2, %	20.8		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? Y / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at 0°	Angle yelding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0		A	1	0.46	46				
0			2	0.48	46				
0	5		3	0.51	46				
0			4	0.53	47				
0	5		5	0.54	47				
0			6	0.52	47				
0			7	0.52	47				
0	5		8	0.53	47				
0			9	0.52	47				
0			10	0.45	47				
0			11	0.46	47				
0			12	0.46	47				
0		B	1	0.46	47				
0			2	0.47	46				
0			3	0.48	46				
0			4	0.53	46				
	5		5	0.52	46				
0			6	0.51	46				
0			7	0.54	47				
0			8	0.54	47				
0			9	0.54	47				
0			10	0.45	47				
0			11	0.45	46				
0			12	0.44	46				
Avg Angle	5		Avg Delta P & Temp	0.49625	46.5				
			avg $\sqrt{DeltaP}$	0.70400					
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$

$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$

$Qs(act) = 60 * Vs * As$

$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$

MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual, wacf/min
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Note: Micromanometer is required if:
(A) The average Delta P readings are less than 0.05 inches of water.
(B) For traverses of 12 or more points, more than 10% of the Delta P readings are below 0.05 inches of water.
(C) For traverses of less than 12 points, more than one Delta P readings is below 0.05 inches of water.

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS

Test Data

Process Mode	Recycle Still and Polymerization	Recycle Still and Polymerization
Run number	1	2
Location	Polymers	Polymers
Date	3/21/2018	3/21/2018
Time period	1133-1330	1408-1553
Operator	MW	MW
Inputs For Calcs.		
Sq. rt. delta P	0.72895	0.71274
Delta H	1.2142	1.1633
Stack temp. (deg.F)	48.1	49.3
Meter temp. (deg.F)	42.3	43.9
Sample volume (act.)	57.188	55.180
Barometric press. (in.Hg)	29.60	29.60
Volume H_2O imp. (ml)	12.0	9.0
Weight change sil. gel (g)	12.0	17.8
% CO_2	0 0	0.0
% O_2	20.9	20.9
% N_2	79.1	79.1
Area of stack (sq.ft.)	4.910	4.910
Sample time (min.)	96.0	96.0
Static pressure (in.H_2O)	-0.24	-0.24
Nozzle dia. (in.)	0.215	0.215
Meter box cal.	0.9890	0.9890
Cp of pitot tube	0.84	0.84
Traverse points	24	24

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS

Test Data

Process Mode	Polymerization and Line Four Extrusion	Polymerization and Line Four Extrusion
Run number	3	4
Location	Polymers	Polymers
Date	3/22/2018	3/22/108
Time period	0856-1047	1227-1412
Operator	MW	MW

Inputs For Calcs.

Sq. rt. delta P	0.71897	0.70960
Delta H	1.1983	1.1825
Stack temp. (deg.F)	48.9	56.2
Meter temp. (deg.F)	43.0	55.8
Sample volume (act.)	55.975	55.372
Barometric press. (in.Hg)	30.03	30.03
Volume H_2O imp. (ml)	2.0	13.0
Weight change sil. gel (g)	12.4	13.7
% CO_2	0.0	0.0
% O_2	20.9	20.9
% N_2	79.1	79.1
Area of stack (sq.ft.)	4.910	4.910
Sample time (min.)	96.0	96.0
Static pressure (in.H_2O)	-0.24	-0.24
Nozzle dia. (in.)	0.215	0.215
Meter box cal.	0.9890	0.9890
Cp of pitot tube	0.84	0.84
Traverse points	24	24

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions	Assumed	Actual					
Client	Chemours				Meter Box ID	30		K Factor	2.29
W.O.#	15418.002.002.0001				Meter Box Y	0.9890			
Project ID	Chemours	% Moisture	3.0		Meter Box Del H	1.9077	Leak Checks	Initial	Mid-Point / Final
Mode/Source ID	Polymer	Impinger Vol (ml)		12	Probe ID / Length	P696 / 7'	Sample Train (ft^3)	0.003	0.002 / .006
Samp. Loc. ID	STK	Silica gel (g)		12.0	Probe Material	Boro	Leak Check @ (in Hg)	15	15 / 6
Run No.ID	1	CO2, % by Vol	0.1	0	Pitot / Thermocouple ID	P690 / P696	Pitot good	yes / no	yes / no / yes / no
Test Method ID	M0010	O2, % by Vol	20.8	20.9	Pitot Coefficient	0.84	Orsat good	yes / no	yes / no / yes / no
Date ID	21MAR2018	Temperature (°F)	46		Nozzle ID	G215	Temp Check	Pre-Test Set	Post-Test Set
Source/Location	Polymer Stack	Meter Temp (°F)	40		Avg Nozzle Dia (in)	0.215	Meter Box Temp	40	41
Sample Date	3/21/18	Static Press (in H_2O)	-0.20	-0.24	Area of Stack (ft^2)	4.91	Reference Temp	40	41
Baro. Press (in Hg)	29.60				Sample Time	96	Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Operator	MB MAT Winkeler	Ambient Temp (°F)	40		Total Traverse Pts	24	Temp Change Response	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1133			393.470									
1	4.0		0.50	1.14	395.80	47	NA	41	110	110	40	4	40	
2	8.0		0.51	1.16	398.00	47	NA	41	105	106	40	4	40	28.441
3	12.0		0.53	1.21	400.35	47		41	100	106	40	4	40	
4	16		0.55	1.26	402.70	47		41	101	101	40	4	40	
5	20		0.57	1.30	405.12	48		41	100	102	40	4	40	
6	24		0.57	1.30	407.62	48		41	100	99	40	4	40	
7	28		0.55	1.26	410.06	48		42	101	101	38	4	38	
8	32		0.55	1.26	412.55	48		42	101	101	38	4	38	
9	36		0.55	1.26	415.35	48		42	100	100	38	4	38	
10	40		0.55	1.26	417.30	48		43	100	98	36	4	36	
11	44		0.52	1.19	419.64	48		43	100	98	36	4	36	
12	48	1221	0.50	1.14	421.911	48		43	100	98	36	4	32	
		1242			422.005		NA							
1	4		0.50	1.14	424.37	48	1	43	100	98	37	4	37	~~34.447~~
2	8		0.50	1.14	426.74	48	1	42	101	99	37	4	37	
3	12		0.51	1.16	429.06	49	1	43	100	106	37	4	37	28.747
4	16		0.51	1.16	431.41	48	1	43	100	103	37	4	36	
5	20		0.51	1.16	433.60	49	1	43	100	102	37	4	37	
6	24		0.52	1.19	436.41	49	1	43	100	99	37	4	37	
7	28		0.56	1.28	438.71	49	1	43	100	102	36	4.5	36	
8	32		0.56	1.28	441.92	49	1	43	100	101	36	4.5	36	
9	36		0.56	1.29	443.86	49	1	43	100	102	37	4.5	37	
10	40		0.56	1.29	446.351	49	1	42	100	99	37	4.5	37	
11	44		0.52	1.19	449.06	49	1	43	100	99	37	4.0	37	
12	48	1330	0.50	1.14 MB	450.752	48	1	43	100	99	37	4.0	37	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts		Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
			0.72895	~~1.21208~~	~~63.168~~	48.1		42.3		110	110	40	4	40
				Avg Sqrt Del H	Comments:									
				~~1.21625~~ MB 1.21417 MB	~~1.10060~~ 57.188 MB 3/21/18									
					~~1.10253~~ 1.10157 MB									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

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			Stack Conditions	Assumed	Actual
Client	Chemours				
W.O.#	15418.002.002.0001				
Project ID	Chemours		% Moisture	3	
Mode/Source ID	Polymer		Impinger Vol (ml)		9 ✓
Samp. Loc. ID	STK		Silica gel (g)		17.8 ✓
Run No.ID	2		CO_2, % by Vol	0.1	0
Test Method ID	M0010		O_2, % by Vol	20.9	20.9
Date ID	21MAR2018		Temperature (°F)	48	
Source/Location	Polymer Stack		Meter Temp (°F)	42	
Sample Date	3/21/18		Static Press (in H_2O)	-0.24	-0.24
Baro. Press (in Hg)	29.60				
Operator	MW Matt Winkler		Ambient Temp (°F)	38	

Meter Box ID	30
Meter Box Y	0.9890
Meter Box Del H	1.9077
Probe ID / Length	P563 / 7'
Probe Material	Boro
Pitot / Thermocouple ID	P563 / P563
Pitot Coefficient	0.84
Nozzle ID	G-215
Avg Nozzle Dia (in)	0.215
Area of Stack (ft²)	4.91
Sample Time	96
Total Traverse Pts	24

K Factor 2.29

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.003	0.001
Leak Check @ (in Hg)	@15	@5	@6
Pitot good	(yes) / no	(yes) / no	(yes) / no
Orsat good	(yes) / no	(yes) / no	(yes) / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	40	46
Reference Temp	40	45
Pass/Fail (+/- 2°)	(Pass) / Fail	(Pass) / Fail
Temp Change Response	(yes) / no	(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1402			451.165									
A 1	4		0.48	1.10	453.24	46	NA	42	112	100	43	4	43	
2	8		0.48	1.10	455.49	48	↓	42	109	96	43	4	43	27.750
3	12		0.51	1.17	457.75	48		42	102	105	43	4	43	
4	16		0.52	1.19	460.06	48		42	100	100	44	4	44	
5	20		0.55	1.26	462.50	48		42	100	100	45	4	44	
6	24		0.52	1.19	464.97	48		42	100	100	45	4	45	
7	28		0.53	1.21	467.37	49		42	101	103	46	4	46	
8	32		0.54	1.23	469.75	49		43	99	101	46	4	46	
9	36		0.53	1.21	472.00	49		43	100	104	46	4	46	
10	40		0.48	1.10	474.36	49		43	100	99	46	4	46	
11	44		0.51	1.17	476.78	49		43	100	96	47	4	47	
12	48	1456	0.48	1.10	478.915	49	↓	43	100	96	47	4	47	
		1505			478.970									
1	4		0.48	1.10	480.93	50	NA	45	101	102	47	4	47	
2	8		0.48	1.10	483.13	50		45	101	102	46	4	46	27.430
3	12		0.49	1.12	485.24	50		45	100	100	46	4	46	
4	16		0.52	1.19	487.70	50		45	101	101	46	4	46	
5	20		0.52	1.19	490.04	50		45	100	108	47	4	47	
6	24		0.52	1.19	492.44	50		45	101	99	48	4	47	
7	28		0.54	1.23	494.81	50		45	100	110	45	4	45	
8	32		0.55	1.26	497.30	50		45	100	109	45	4	45	
9	36		0.54	1.23	499.56	50		46	100	108	45	4	45	
10	40		0.48	1.10	501.82	50		46	101	101	44	4	44	
11	44		0.47	1.08	503.75	51		46	100	100	44	4	44	
12	48	1553	0.48	1.10	506.400	51	↓	46	100	101	43	4	43	
			Avg Sqrt Delta P 0.71274 ✓	Avg Delta H 1.16333 ✓	Total Volume 55.180 ✓	Avg Ts 49.3 ✓		Avg Tm 43.9 ✓	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H 1.0782 ✓										

Comments:

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

SRY

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions							
Client	Chemours		Assumed	Actual	Meter Box ID	30		K Factor	2.29
W.O.#	15418.002.002.0001				Meter Box Y	0.9890			
Project ID	Chemours	% Moisture	2.0		Meter Box Del H	1.9077	**Leak Checks**	Initial	Mid-Point / Final
Mode/Source ID	Polymer	Impinger Vol (ml)		4	Probe ID / Length	P696 7'	Sample Train (ft^3)	0.001	0.002 / 0.0015
Samp. Loc. ID	STK	Silica gel (g)		12.4	Probe Material	Boro	Leak Check @ (in Hg)	✓5	✓5
Run No.ID	3	CO2, % by Vol	0-1	0	Pitot / Thermocouple ID	P696 P696	Pitot good	yes / no	yes / no
Test Method ID	M0010	O2, % by Vol	20.9	20.9	Pitot Coefficient	0.84	Orsat good	yes / no	yes / no
Date ID	21MAR2018	Temperature (°F)	48		Nozzle ID	F215	**Temp Check**	Pre-Test Set	Post-Test Set
Source/Location	Polymer Stack	Meter Temp (°F)	45		Avg Nozzle Dia (in)	0.215	Meter Box Temp	40	40
Sample Date	3/22/18	Static Press (in H_2O)	-0.24	-0.24	Area of Stack (ft^2)	4.91	Reference Temp	40	40
Baro. Press (in Hg)	30.03				Sample Time	96	Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Operator	MB/MATT WINKLER	Ambient Temp (°F)		42	Total Traverse Pts	A 24	Temp Change Response	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	0856			506.700									
A 1	4		0.48	1.10	509.01	47	NA	40	99	98	43	4	43	
2	8		0.49	1.12	511.09	47		41	100	100	43	4	43	
3	12		0.52	1.21	513.41	47		41	102	102	43	4	43	← K-Factor curve
4	16		0.54	1.25	515.75	48		41	102	102	43	4	42	
5	20		0.55	1.28	518.14	48		41	102	101	41	4	41	2.33
6	24		0.55	1.28	520.52	48		41	102	101	41	4	41	
7	28		0.54	1.25	522.95	48		41	102	101	40	4	40	27.980
8	32		0.54	1.25	525.35	48		42	100	100	40	4	40	
9	36		0.54	1.25	528.01	48		42	102	102	42	4	42	
10	40		0.56	1.30	530.17	48		42	102	102	42	4	42	
11	44		0.48	1.10	532.65	49		42	101	101	42	4	42	
12	48	0944	0.48	1.10	534.680	49		42	101	101	42	4	42	
		0959			534.850		NA							
1	4		0.46	1.07	537.32	49		44	101	101	42	4	42	
2	8		0.48	1.10	539.72	49		44	101	101	42	4	42	27.995
3	12		0.52	1.21	541.60	49		44	101	101	41	4	41	
4	16		0.54	1.25	544.10	49		44	100	100	41	4	41	
5	20		0.55	1.28	546.36	49		44	101	101	41	4	41	
6	24		0.54	1.25	548.75	50		44	101	100	40	4	40	
7	28		0.55	1.28	551.20	50		45	102	100	40	4	40	
8	32		0.55	1.28	553.62	50		45	102	100	40	4	40	
9	36		0.54	1.25	556.25	51		45	102	100	40	4	39	
10	40		0.50	1.17	558.30	51		45 46	102	100	40	4	39	
11	44		0.48	1.10	560.67	51		46	102	100	40	4	40	
12	48	1047	0.44	1.03	562.845	51		46	101	101	40	4	40	
			Avg Sqrt Delta P 0.71897	Avg Delta H 1.19833	Total Volume 55.975	Avg Ts 48.9		Avg Tm 43.0	Min/Max 102	Min/Max 102	Max Temp 43	Max Vac 4	Max Temp 43	
				Avg Sqrt Del H 1.09402	Comments:									EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions					
Client	Chemours		Assumed	Actual	Meter Box ID	20	
W.O.#	15418.002.002.0001				Meter Box Y	0.9920	
Project ID	Chemours	% Moisture	2		Meter Box Del H	1.9077	**Leak Checks**
Mode/Source ID	Polymer	Impinger Vol (ml)		13.0	Probe ID / Length	P696 7	Sample Train (ft^3)
Samp. Loc. ID	STK	Silica gel (g)		13.7	Probe Material	Boro	Leak Check @ (in Hg)
Run No.ID	4	CO2, % by Vol	0.1	0	Pitot / Thermocouple ID	P696 P696	Pitot good
Test Method ID	M0010	O2, % by Vol	20.9	MW 20.9	Pitot Coefficient	0.84	Orsat good
Date ID	21MAR2018	Temperature (°F)	48		Nozzle ID	0.215	**Temp Check**
Source/Location	Polymer Stack	Meter Temp (°F)	52 44		Avg Nozzle Dia (in)	0.215	Meter Box Temp
Sample Date	3/22/18	Static Press (in H_2O)	-0.24	-0.24	Area of Stack (ft^2)	4.91	Reference Temp
Baro. Press (in Hg)	30.03		MW		Sample Time	96	Pass/Fail (+/- 2°)
Operator	MW Matt Winkler	Ambient Temp (°F)	58	53	Total Traverse Pts	24	Temp Change Response

K Factor 2.33

	Initial	Mid-Point	Final
	0.0021	0.00215	0.0015
	c15	c6	c6
	(yes) / no	(yes) / no	(yes) / no
	(yes) / no	(yes) / no	(yes) / no
	Pre-Test Set		Post-Test Set
	53		52
	53		52
	(Pass) / Fail		(Pass) / Fail
	(yes) / no		(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1227			563.322									
A 1	4		0.45	1.05	565.30	55	NA	51	102	104	46	4	46	
2	8		0.50	1.17	567.66	55		52	102	102	47	4	47	
3	12		0.53	1.23	570.10	55		52	102	102	47	4	47	
4	16		0.55	1.28	572.82	55		53	102	103	47	4	47	
5	20		0.55	1.28	574.80	55		53	102	102	46	4	46	K-FACTOR
6	24	MW	0.53	1.264	577.00	55		54	100	100	45	4	45	2.35
7	28		0.52	1.22	579.60	55		54	102	101	45	4	45	
8	32		0.52	1.22	581.90	56		54	102	100	46	4	46	27.997
9	36		0.53	1.25	584.28	56		55	102	101	46	4	46	
10	40		0.52	1.22	586.68	56		56	100	102	46	4	46	
11	44		0.55	1.29	589.07	56		57	100	100	46	4	46	
12	48	1315	0.44	1.03	591.319	58		57	101	101	47	4	47	
		1324			591.400		NA							
B 1	4		0.45	1.06	593.35	56		57	101	104	47	4	46	
2	8		0.47	1.10	595.87	56		57	99	100	46	4	46	27.375
3	12		0.50	1.18	598.04	56		57	100	101	47	4	47	
4	16		0.50	1.18	600.65	56		57	100	100	47	4	47	
5	20		0.51	1.20	603.71	56		57	100	101	48	4	48	
6	24		0.50	1.18	605.09	56		58	100	102	49	4	47	
7	28		0.54	1.27	607.32	57		58	100	102	47	4	48	
8	32		0.54	1.27	609.67	57		58	100	102	47	4	48	
9	36		0.52	1.22	612.21	58		58	100	101	48	4	48	
10	40		0.49	1.13	614.40	58		58	100	99	49	4	49	
11	44		0.46	1.08	616.57	58		58	100	100	49	4	49	
12	48	1412	0.44	1.03	618.775	58		58	101	101	49	4	49	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts		Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			0.70960	1.18250	55.372	56.2		55.8	102	104	49	4	49	

Avg Sqrt Del H: ~~1.08668~~ MW 1.0868 / 1.08676

Comments:

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Location	Polymer Stack

Run No. 1 — Sample Date 3/21/18 — Recovery Date 3/21/18

Sample I.D. Chemours - Polymer - STK - 1 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	1	27	109	25					312.0	
Initial	0	100	100	0					300	
Gain	1	-23	9	25				12	12.0	24.0

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 2 — Sample Date 3/21/18 — Recovery Date 3/21/18

Sample I.D. Chemours - Polymer - STK - 2 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	1	101	106	1					317.8	
Initial	0	100	100	0					300	
Gain	1	1	6	1				9	17.8	26.8

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 3 — Sample Date 3/22/18 — Recovery Date 3/22/18

Sample I.D. Chemours - Polymer - STK - 3 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	2	98	100	2					312.4	
Initial	0	100	100	0					300	
Gain	2	-2	0	2				4	12.4	

Impinger Color: Clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Location	Polymer Stack

Run No. 4 Sample Date 3/21/18 Recovery Date 3/22/18

Sample I.D. Chemours - Polymer - STK - 4 - M0010 - Analyst [illegible] Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	1	99	110	3					137	
Initial	0	100	100	0					300	
Gain	1	~1	10	3				13	13.7	26.7

Impinger Color Clear Labeled? ✓

Silica Gel Condition Good Sealed? ✓

Run No. 5 Sample Date _____ Recovery Date _____

Sample I.D. Chemours - Polymer - STK - 5 - M0010 - Analyst _____ Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Run No. 6 Sample Date _____ Recovery Date _____

Sample I.D. Chemours - Polymer - STK - 6 - M0010 - Analyst _____ Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Check COC for Sample IDs of Media Blanks

METHODS AND ANALYZERS

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

File: C:\DATA\JMI Devon\March 2018\032118 polymer .cem
Program Version: 2.1, built 19 May 2017 **File Version:** 2.02
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Start Time: 07:59

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC317774
21.0	SG9169108

Calibration Results

Zero	7 mv
Span, 21.0 %	8005 mv

Curve Coefficients

Slope	**Intercept**
380.9	7

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC317774
16.6	SG9169108

Calibration Results

Zero	7 mv
Span, 16.6 %	8287 mv

Curve Coefficients

Slope	**Intercept**
499.4	7

CALIBRATION ERROR DATA

Number 1

Client: **Chemors** | Project Number: **15418.002.002**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **21 Mar 2018**

Start Time: 07:59

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.9 **Intercept** 7.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %
Slope 499.4 **Intercept** 7.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemors** | Project Number: **15418.002.002**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **21 Mar 2018**

Start Time: 10:00

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
recycle still and polymerization		
11:34	20.5	0.1
11:35	20.8	0.1
11:36	20.8	0.0
11:37	20.8	0.0
11:38	20.8	0.0
11:39	20.8	0.0
11:40	20.8	0.0
11:41	20.8	0.0
11:42	20.8	0.0
11:43	20.8	0.0
11:44	20.8	0.0
11:45	20.8	0.0
11:46	20.8	0.0
11:47	20.8	0.0
11:48	20.8	0.0
11:49	20.8	0.0
11:50	20.8	0.0
11:51	20.8	0.0
11:52	20.8	0.0
11:53	20.8	0.0
11:54	20.8	0.0
11:55	20.8	0.0
11:56	20.8	0.0
11:57	20.8	0.0
11:58	20.8	0.0
11:59	20.8	0.0
12:00	20.8	0.0
12:01	20.8	0.0
12:02	20.8	0.0
12:03	20.8	0.0
12:04	20.8	0.0
12:05	20.8	0.0
12:06	20.8	0.0
12:07	20.8	0.0
12:08	20.8	0.0
12:09	20.8	0.0
12:10	20.8	0.0
12:11	20.8	0.0
12:12	20.8	0.0

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
12:13	20.8	0.0
12:14	20.8	0.0
12:15	20.8	0.0
12:16	20.8	0.0
12:17	20.8	0.0
12:18	20.8	0.0
12:19	20.8	0.0
12:20	20.8	0.0
12:21	20.8	0.0
12:43	20.8	0.0
12:44	20.8	0.0
12:45	20.8	0.0
12:46	20.8	0.0
12:47	20.8	0.0
12:48	20.8	0.0
12:49	20.8	0.0
12:50	20.8	0.0
12:51	20.8	0.0
12:52	20.8	0.0
12:53	20.8	0.0
12:54	20.8	0.0
12:55	20.8	0.0
12:56	20.8	0.0
12:57	20.8	0.0
12:58	20.8	0.0
12:59	20.8	0.0
13:00	20.8	0.0
13:01	20.8	0.0
13:02	20.8	0.0
13:03	20.8	0.0
13:04	20.8	0.0
13:05	20.8	0.0
13:06	20.8	0.0
13:07	20.8	0.0
13:08	20.8	0.0
13:09	20.8	0.0
13:10	20.8	0.0
13:11	20.8	0.0
13:12	20.8	0.0
13:13	20.8	0.0

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
13:14	20.8	0.0
13:15	20.8	0.0
13:16	20.8	0.0
13:17	20.8	0.0
13:18	20.8	0.0
13:19	20.8	0.0
13:20	20.8	0.0
13:21	20.8	0.0
13:22	20.8	0.0
13:23	20.8	0.0
13:24	20.8	0.0
13:25	20.8	0.0
13:26	20.8	0.0
13:27	20.8	0.0
13:28	20.8	0.0
13:29	20.8	0.0
13:30	20.8	0.0
Avgs	**20.8**	**0.0**

RUN SUMMARY

Number 1

Client: **Chemors** | Project Number: **15418.002.002**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **21 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 11:33 to 13:30

Run Averages

	20.8	0.0

Pre-run Bias at 10:00

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Post-run Bias at 13:58

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

	21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemors** | Project Number: **15418.002.002**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **21 Mar 2018**

Start Time: 13:58

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.9	11.9	0.0	0.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 1

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
14:09	20.9	0.0
14:10	20.8	0.0
14:11	20.8	0.0
14:12	20.9	0.0
14:13	20.8	0.0
14:14	20.9	0.0
14:15	20.9	0.0
14:16	20.9	0.0
14:17	20.9	0.0
14:18	20.9	0.0
14:19	20.9	0.0
14:20	20.9	0.0
14:21	20.9	0.0
14:22	20.9	0.0
14:23	20.9	0.0
14:24	20.9	0.0
14:25	20.9	0.0
14:26	20.9	0.0
14:27	20.9	0.0
14:28	20.9	0.0
14:29	20.9	0.0
14:30	20.9	0.0
14:31	20.9	0.0
14:32	20.9	0.0
14:33	20.9	0.0
14:34	20.9	0.0
14:35	20.9	0.0
14:36	20.9	0.0
14:37	20.9	0.0
14:38	20.9	0.0
14:39	20.9	0.0
14:40	20.9	0.0
14:41	20.9	0.0
14:42	20.9	0.0
14:43	20.9	0.0
14:44	20.9	0.0
14:45	20.9	0.0
14:46	20.9	0.0
14:47	20.9	0.0
14:48	20.9	0.0

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
14:49	20.9	0.0
14:50	20.9	0.0
14:51	20.9	0.0
14:52	20.9	0.0
14:53	20.9	0.0
14:54	20.9	0.0
14:55	20.9	0.0
14:56	21.0	0.0
15:06	20.9	0.0
15:07	20.9	0.0
15:08	20.9	0.0
15:09	21.0	0.0
15:10	21.0	0.0
15:11	21.0	0.0
15:12	21.0	0.0
15:13	21.0	0.0
15:14	21.0	0.0
15:15	21.0	0.0
15:16	21.0	0.0
15:17	21.0	0.0
15:18	21.0	0.0
15:19	21.0	0.0
15:20	21.0	0.0
15:21	21.0	0.0
15:22	21.0	0.0
15:23	21.0	0.0
15:24	21.0	0.0
15:25	21.0	0.0
15:26	21.0	0.0
15:27	21.0	0.0
15:28	21.0	0.0
15:29	21.0	0.0
15:30	21.0	0.0
15:31	21.0	0.0
15:32	21.0	0.0
15:33	21.0	0.0
15:34	21.0	0.0
15:35	21.0	0.0
15:36	21.0	0.0
15:37	21.0	0.0

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number: **15418.002.002**
Operator: **SR**
Date: **21 Mar 2018**

Time	O_2 %	CO_2 %
15:38	21.0	0.0
15:39	21.0	0.0
15:40	21.0	0.0
15:41	21.0	0.0
15:42	21.0	0.0
15:43	21.0	0.0
15:44	21.0	0.0
15:45	21.0	0.0
15:46	21.0	0.0
15:47	21.0	0.0
15:48	21.0	0.0
15:49	21.0	0.0
15:50	21.0	0.0
15:51	21.0	0.0
15:52	21.0	0.0
15:53	21.0	0.0
Avgs	**20.9**	**0.0**

RUN SUMMARY

Number 2

Client: **Chemors**			Project Number: **15418.002.002**
Location: **Fayetteville, NC**			Operator: **SR**
Source: **Polymer**	Calibration **1**		Date: **21 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 14:08 to 15:53

Run Averages

20.9	0.0

Pre-run Bias at 13:58

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Post-run Bias at 16:20

Zero Bias	0.0	0.0
Span Bias	12.0	8.6
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemors** | Project Number: **15418.002.002**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **21 Mar 2018**

Start Time: 16:20

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.9	12.0	0.1	0.5	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.6	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.6	0.1	0.6	Pass

*Bias No. 2

METHODS AND ANALYZERS

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Polymer** Date: **22 Mar 2018**

\IASData\Client Folders.A-F\Chemours\15418.002.002 Fayetteville 2018 Stack Testing\Data\Week of March 19th\03

Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Project Number:
Operator: **SR**
Date: **22 Mar 2018**

Start Time: 07:41

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC317774
21.0	SG9169108

Calibration Results

Zero	5 mv
Span, 21.0 %	8003 mv

Curve Coefficients

Slope	**Intercept**
380.9	5

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC317774
16.6	SG9169108

Calibration Results

Zero	6 mv
Span, 16.6 %	8289 mv

Curve Coefficients

Slope	**Intercept**
499.6	6

CALIBRATION ERROR DATA

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Polymer** Calibration **1** Date: **22 Mar 2018**

Start Time: 07:41

O_2

Method: EPA 3A

Span Conc. 21.0 %

Slope 380.9 **Intercept** 5.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Slope 499.6 **Intercept** 6.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemors** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Polymer** Calibration **1** Date: **22 Mar 2018**

Start Time: 07:47

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

RUN DATA

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
Polymerization and Line Four Extrusion		
08:57	21.0	0.0
08:58	21.0	0.0
08:59	21.0	0.0
09:00	21.0	0.0
09:01	21.0	0.0
09:02	21.0	0.0
09:03	21.0	0.0
09:04	21.0	0.0
09:05	21.0	0.0
09:06	21.0	0.0
09:07	21.0	0.0
09:08	21.0	0.0
09:09	21.0	0.0
09:10	21.0	0.0
09:11	21.0	0.0
09:12	21.0	0.0
09:13	21.0	0.0
09:14	21.0	0.0
09:15	21.0	0.0
09:16	21.0	0.0
09:17	21.0	0.0
09:18	21.0	0.0
09:19	21.0	0.0
09:20	21.0	0.0
09:21	21.0	0.0
09:22	21.0	0.0
09:23	21.0	0.0
09:24	21.0	0.0
09:25	21.0	0.0
09:26	21.0	0.0
09:27	21.0	0.0
09:28	21.0	0.0
09:29	21.0	0.0
09:30	21.0	0.0
09:31	21.0	0.0
09:32	21.0	0.0
09:33	21.0	0.0
09:34	21.0	0.0
09:35	21.0	0.0

RUN DATA

Number 3

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number:
Operator: **SR**
Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
09:36	21.0	0.0
09:37	21.0	0.0
09:38	21.0	0.0
09:39	21.0	0.0
09:40	21.0	0.0
09:41	21.0	0.0
09:42	21.0	0.0
09:43	21.0	0.0
09:44	21.0	0.0
10:00	21.0	0.0
10:01	21.0	0.0
10:02	21.0	0.0
10:03	21.0	0.0
10:04	21.0	0.0
10:05	21.0	0.0
10:06	21.0	0.0
10:07	21.0	0.0
10:08	21.0	0.0
10:09	21.0	0.0
10:10	21.0	0.0
10:11	21.0	0.0
10:12	21.0	0.0
10:13	21.0	0.0
10:14	21.0	0.0
10:15	21.0	0.0
10:16	21.0	0.0
10:17	21.0	0.0
10:18	21.0	0.0
10:19	21.0	0.0
10:20	21.0	0.0
10:21	21.0	0.0
10:22	21.0	0.0
10:23	21.0	0.0
10:24	21.0	0.0
10:25	21.0	0.0
10:26	21.0	0.0
10:27	21.0	0.0
10:28	21.0	0.0
10:29	21.0	0.0
10:30	21.0	0.0

RUN DATA

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
10:31	21.0	0.0
10:32	21.0	0.0
10:33	21.0	0.0
10:34	21.0	0.0
10:35	21.0	0.0
10:36	21.0	0.0
10:37	21.0	0.0
10:38	21.0	0.0
10:39	21.0	0.0
10:40	21.0	0.0
10:41	21.0	0.0
10:42	21.0	0.0
10:43	21.0	0.0
10:44	21.0	0.0
10:45	21.0	0.0
10:46	21.0	0.0
10:47	21.0	0.0
Avgs	**21.0**	**0.0**

RUN SUMMARY

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 08:56 to 10:47

Run Averages

21.0	0.0

Pre-run Bias at 07:47

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Post-run Bias at 11:27

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

21.1	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

Start Time: 11:27

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.9	12.0	0.1	0.5	Pass

*Bias No. 1

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 1

RUN DATA

Number 4

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number:
Operator: **SR**
Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
12:28	20.9	0.0
12:29	20.9	0.0
12:30	20.9	0.0
12:31	20.9	0.0
12:32	20.9	0.0
12:33	21.0	0.0
12:34	21.0	0.0
12:35	21.0	0.0
12:36	21.0	0.0
12:37	21.0	0.0
12:38	21.0	0.0
12:39	21.0	0.0
12:40	21.0	0.0
12:41	21.0	0.0
12:42	21.0	0.0
12:43	21.0	0.0
12:44	21.0	0.0
12:45	21.0	0.0
12:46	21.0	0.0
12:47	21.0	0.0
12:48	21.0	0.0
12:49	21.0	0.0
12:50	21.0	0.0
12:51	21.0	0.0
12:52	21.0	0.0
12:53	21.0	0.0
12:54	21.0	0.0
12:55	21.0	0.0
12:56	21.0	0.0
12:57	21.0	0.0
12:58	21.0	0.0
12:59	21.0	0.0
13:00	21.0	0.0
13:01	21.0	0.0
13:02	21.0	0.0
13:03	21.0	0.0
13:04	21.0	0.0
13:05	21.0	0.0
13:06	21.0	0.0
13:07	21.0	0.0

RUN DATA

Number 4

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
13:08	21.0	0.0
13:09	21.0	0.0
13:10	21.0	0.0
13:11	21.0	0.0
13:12	21.0	0.0
13:13	21.0	0.0
13:14	21.0	0.0
13:15	21.0	0.0
13:25	20.9	0.0
13:26	20.9	0.0
13:27	20.9	0.0
13:28	20.9	0.0
13:29	20.9	0.0
13:30	20.9	0.0
13:31	21.0	0.0
13:32	21.0	0.0
13:33	21.0	0.0
13:34	21.0	0.0
13:35	21.0	0.0
13:36	21.0	0.0
13:37	20.9	0.0
13:38	21.0	0.0
13:39	21.0	0.0
13:40	21.0	0.0
13:41	21.0	0.0
13:42	21.0	0.0
13:43	21.0	0.0
13:44	21.0	0.0
13:45	21.0	0.0
13:46	21.0	0.0
13:47	21.0	0.0
13:48	21.0	0.0
13:49	21.0	0.0
13:50	21.0	0.0
13:51	21.0	0.0
13:52	21.0	0.0
13:53	21.0	0.0
13:54	21.0	0.0
13:55	21.0	0.0
13:56	21.0	0.0

RUN DATA

Number 4

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Polymer**

Calibration **1**

Project Number:
Operator: **SR**
Date: **22 Mar 2018**

Time	O_2 %	CO_2 %
13:57	21.0	0.0
13:58	21.0	0.0
13:59	21.0	0.0
14:00	21.0	0.0
14:01	21.0	0.0
14:02	21.0	0.0
14:03	21.0	0.0
14:04	21.0	0.0
14:05	21.0	0.0
14:06	20.9	0.0
14:07	21.0	0.0
14:08	20.9	0.0
14:09	20.9	0.0
14:10	20.9	0.0
14:11	20.9	0.0
14:12	20.9	0.0
Avgs	**21.0**	**0.0**

RUN SUMMARY

Number 4

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 12:27 to 14:12

Run Averages

21.0	0.0

Pre-run Bias at 11:27

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 14:47

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemors** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Polymer** | Calibration **1** | Date: **22 Mar 2018**

Start Time: 14:47

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 2

Sample and Velocity Traverse Point Data Sheet - Method 1

Client: Chemours
Location/Plant: Fayetteville
Source: Semi Works

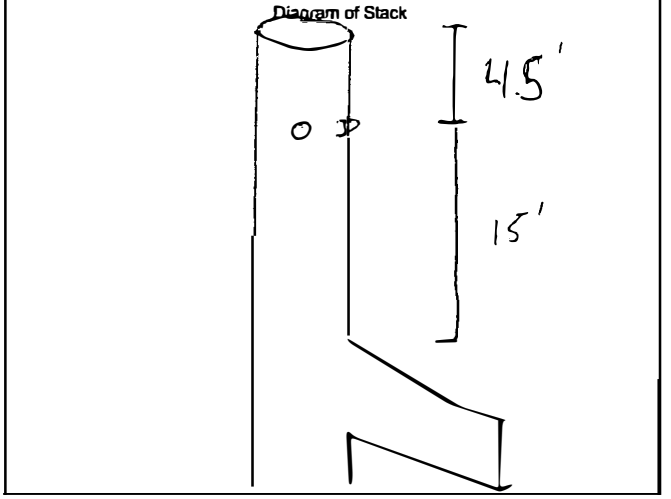
Operator: SR
Date: 3/22/18
W.O. Number:

Duct Type	☐	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐	Particulate Traverse	☐	Velocity Traverse	☐ CEM Traverse

Distance from far wall to outside of port (in.) = C	45
Port Depth (in.) = D	18
Depth of Duct, diameter (in.) = C-D	27
Area of Duct (ft^2)	3.98
Total Traverse Points	16
Total Traverse Points per Port	8
Port Diameter (in.) —(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Flow Disturbances	
Upstream - A (ft)	4.5
Downstream - B (ft)	15
Upstream - A (duct diameters)	2
Downstream - B (duct diameters)	6.5

Diagram of Stack



Traverse Point Locations

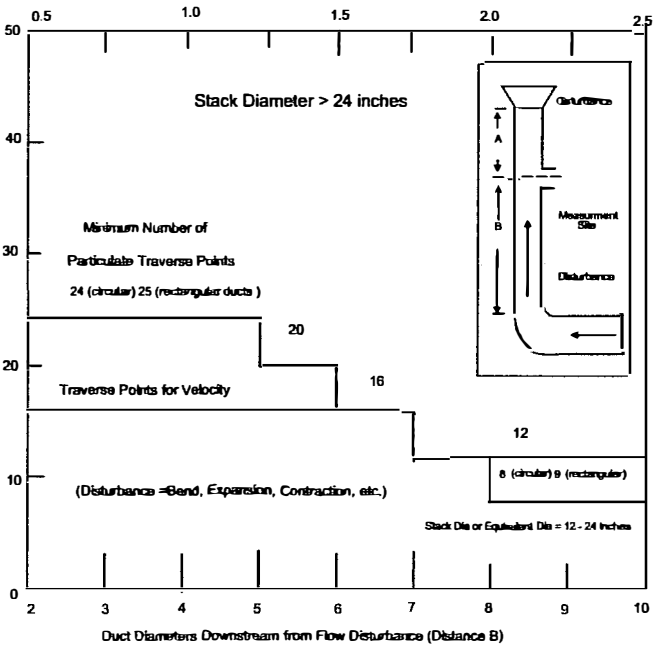
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	1	19
2	10.5	2 7/8	20 7/8
3	19.4	5 1/4	23 1/4
4	32.3	8 3/4	26 3/4
5	67.7	18 1/4	36 1/4
6	80.6	21 3/4	39 3/4
7	89.5	24 1/8	42 1/8
8	96.8	26	44
9			
10			
11			
12			

CEM 3 Point(Long Measurement Line) Stratification Point Locations

1	0.167		
2	0.50		
3	0.833		

Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall

Duct Diameters Upstream from Flow Disturbance (Distance A)



Duct Diameters Downstream from Flow Disturbance (Distance B)

Traverse Point Location Percent of Stack -Circular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

7 ft monorail for split train

Determination of Stack Gas Velocity - Method 2

Client: Chemours | Operator: MW LKS | Pitot Coeff (Cp): 0.84
Location/Plant: Fayetteville, NC | Date: 3/22/18 | Stack Area, ft² (As): 3.99
Source: SEMI WORKS | W.O. Number: 10418.002.001 | Pitot Tube/Thermo ID: PS63

Run Number			
Time	1645 - 1702		
Barometric Press, in Hg (Pb)	30.06		
Static Press, in H_2O (Pstatic)	~~-0.10~~ -0.20		
Source Moisture, % (BWS)	1		
O_2, %	0.1		
CO_2, %	20.8		

Cyclonic Flow Determination		Traverse Location		Leak Check good? (Y) N		Leak Check good? Y / N		Leak Check good? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0		A	1	0.40	61				
0			2	0.42	62				
0			3	0.40	62				
0			4	0.40	63				
0			5	0.40	63				
0			6	0.39	63				
0			7	0.36	64				
0			8	0.30	64				
			9						
0		B	1	0.41	61				
0			2	0.42	62				
0			3	0.43	62				
0			4	0.43	63				
0			5	0.42	63				
0			6	0.39	64				
0			7	0.36	64				
0			8	0.30	64				
Avg Angle		Avg Delta P & Temp		0.38938	62.8				
		avg $\sqrt{DeltaP}$		0.62314					
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$

$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$

$Qs(act) = 60 * Vs * As$

$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$

where:
MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual, wacf/min
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Comments _____

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS

Test Data			
Run number	1	2	3
Location	Semi-Works	Semi-Works	Semi-Works
Date	3/23/2018	3/23/2018	3/23/2018
Time period	0852-1041	1157-1341	1425-1609
Operator	MW	MW	MW
Inputs For Calcs.			
Sq. rt. delta P	0.61521	0.62452	0.62480
Delta H	1.2606	1.3300	1.3494
Stack temp. (deg.F)	60.9	66.4	69.8
Meter temp. (deg.F)	58.0	72.7	79.7
Sample volume (act.)	58.024	60.895	60.905
Barometric press. (in.Hg)	30.29	30.29	30.21
Volume H_2O imp. (ml)	3.0	6.0	7.0
Weight change sil. gel (g)	14.3	15.5	15.2
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	3.976	3.976	3.976
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	-0.25	-0.25	-0.25
Nozzle dia. (in.)	0.235	0.235	0.235
Meter box cal.	0.9890	0.9890	0.9890
Cp of pitot tube	0.84	0.84	0.84
Traverse points	16	16	16

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

Page 1 of 2

K Factor 3.25

Client	Chemours	**Stack Conditions**	Assumed	Actual	
W.O.#	15418.002.002.0001				
Project ID	Chemours	% Moisture	1.5		
Mode/Source ID	SemiWorks	Impinger Vol (ml)		3	
Samp. Loc. ID	STK	Silica gel (g)		14.3	
Run No.ID	1	CO2, % by Vol	0.1	0	
Test Method ID	M0010	O2, % by Vol	20.8	20.9	
Date ID	22MAR2018	Temperature (°F)	63		
Source/Location	SemiWorks Stack	Meter Temp (°F)	36		
Sample Date	3/23/18	Static Press (in H_2O)	-0.20	-0.25	
Baro. Press (in Hg)	30.29				
Operator	MW Matt Winkelen	Ambient Temp (°F)	42		

Meter Box ID	30
Meter Box Y	0.9890
Meter Box Del H	1.9077
Probe ID / Length	P696 / 5'
Probe Material	Boro
Pitot / Thermocouple ID	P696 / P696
Pitot Coefficient	0.84
Nozzle ID	G235
Avg Nozzle Dia (in)	0.235
Area of Stack (ft²)	~~3.94~~ MW 3.97
Sample Time	96
Total Traverse Pts	16

Leak Checks	Initial	Mid-Point	Final
Sample Train (ft³)	0.0012	0.001	0.003
Leak Check @ (in Hg)	@ 15	@ 5	@ 5
Pitot good	(yes) / no	(yes) / no	(yes) / no
Orsat good	(yes) / no	(yes) / no	(yes) / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	42	64
Reference Temp	42	63
Pass/Fail (+/- 2°)	(Pass) / Fail	(Pass) / Fail
Temp Change Response	yes / no	(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	~~0834~~ 0852			619.566									
A 1	3		0.39	1.27	621.47	57	NA	50	100	99	43	4	43	
1	6		0.40	1.30	623.21	59		50	100	102	42	4	42	
2	9		0.41	1.33	625.05	59		50	100	104	42	4	42	
2	12		0.42	1.37	626.90	59		50	100	99	41	4	41	28.744
3	15		0.43	1.40	628.78	59		52	100	99	41	4	41	
3	18		0.44	1.43	630.67	59		52	101	99	41	4	41	
4	21		0.44	1.43	632.51	60		53	100	100	41	4	41	
4	24		0.43	1.40	634.44	60		53	100	100	41	4	41	
5	27		0.39	1.27	636.45	60		53	100	100	40	4	40	
5	30		0.39	1.27	638.27	60		54	100	100	40	4	40	
6	33		0.35	1.14	640.07	60		56	100	100	41	4	41	
6	36		0.35	1.14	641.57	60		56	101	101	42	4	42	
7	39		0.33	1.07	643.30	60		56	101	101	42	4	42	K-FACTOR
7	42		0.33	1.10	644.01	60		57	100	100	42	4	42	←3.36
MW 8	45		0.30	1.01	646.71	58		57	100	99	42	4	42	
8	48	0940	0.30	1.01	648.310	58	↓	57	100	99	42	4	42	

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
					102				

Avg Sqrt Del H	Comments:

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

SK

ISOKINETIC FIELD DATA SHEET — EPA Method 0010 - Semi-Volatiles

Client: Chemours | Operator: MW MATT WINKELER
Source: SemiWorks | Run No.: 1
Sample Loc.: Stack | Date: 3/23/18 | K Factor: 3.37

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	0953			648.395									
B 1	3		0.40	1.35	650.25	61	NA	60	100	101	43	4	43	
1	6		0.40	1.35	652.55	62		60	100	101	43	4	43	
2	9		0.43	1.45	654.25	62		60	100	101	43	4	43	
2	12		0.43	1.45	655.80	62		60	100	101	41	4	41	
3	15		0.44	1.48	657.74	63		62	100	100	41	4	41	29.280
3	18		0.44	1.48	658.71	63		62	101	101	41	4	41	
4	21		0.41	1.38	662.01	62		62	100	100	41	4	41	
4	24		0.41	1.38	663.56	62		62	102	102	42	4	42	
5	27		0.38	1.28	665.52	63		63	100	101	44	4	44	
5	30		0.38	1.28	667.31	63		63	100	102	44	4	44	
6	33		0.35	1.17	669.22	63		64	100	101	44	4	44	
6	36		0.35	1.17	670.90	63		64	100	101	44	4	44	
7	39		0.32	1.08	672.82	63		64	101	100	44	4	44	
7	42		0.32	1.08	674.34	63		65	101	100	44	4	44	
8	45		0.30	1.01	675.92	63		65	101	101	44	4	44	
8	48	1041	0.30	1.01	677.675	62		65	101	101	45	4	45	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			0.6152	1.26063	58.024	60.9	58.0		102	104	45	4	45	
				Avg Sqrt Del H	Comments:									
				1.12064										

SK

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions	Assumed	Actual
Client	Chemours	% Moisture	1.5	
W.O.#	15418.002.002.0001	Impinger Vol (ml)		
Project ID	Chemours	Silica gel (g)		
Mode/Source ID	SemiWorks	CO2, % by Vol	0.1	
Samp. Loc. ID	STK	O2, % by Vol	20.8	
Run No.ID	2	Temperature (°F)	62	
Test Method ID	M0010	Meter Temp (°F)	66	
Date ID	22MAR2018	Static Press (in H_2O)	-0.25	-0.25
Source/Location	SemiWorks Stack			
Sample Date	3/23/18			
Baro. Press (in Hg)	30.29			
Operator	MD Matt Winkelman	Ambient Temp (°F)	58	

		Leak Checks	Initial	Mid-Point	Final
Meter Box ID	30	Sample Train (ft^3)	0.0012	0.0012	0.0016
Meter Box Y	0.9890	Leak Check @ (in Hg)	≥15	≥6	≥6
Meter Box Del H	1.9077	Pitot good	yes / no	yes / no	yes / no
Probe ID / Length	P563	Orsat good	yes / no	yes / no	yes / no
Probe Material	Boro				
Pitot / Thermocouple ID	P563 P563				
Pitot Coefficient	0.84				
Nozzle ID	G235	**Temp Check**	Pre-Test Set		Post-Test Set
Avg Nozzle Dia (in)	0.235	Meter Box Temp	63		74
Area of Stack (ft^2)	3.97	Reference Temp	63		74
Sample Time	96	Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Total Traverse Pts	16	Temp Change Response	yes / no		yes / no

K Factor 337

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1157			682.455									
A 1	3		0.40	1.35	684.17	64	NA	68	100	115	50	4	49	
1	6		0.40	1.35	686.10	64		68	101	101	50	4	50	K Factor
2	9		0.43	1.46	688.21	65		69	101	101	49	5	49	≥ 3.41
2	12		0.43	1.46	690.04	65		69	100	109	49	5	49	
3	15		0.44	1.50	692.02	66		70	100	102	49	5	49	
3	18		0.44	1.50	694.10	66		70	100	100	49	5	49	30.345
4	21		0.43	1.46	696.18	67		71	100	100	48	5	48	
4	24		0.43	1.46	698.01	67		71	100	100	48	5	48	
5	27		0.41	1.39	700.02	67		72	100	101	48	5	48	
5	30		0.41	1.39	702.03	67		72	100	101	48	5	48	
6	33		0.38	1.30	703.82	67		72	100	100	48	5	48	
6	36		0.38	1.30	705.72	67		72	100	100	48	5	48	
7	39		0.35	1.19	707.57	67		72	100	102	48	5	48	
7	42		0.35	1.19	709.37	67		72	100	102	48	5	48	
8	45		0.31	1.06	711.10	65		72	100	103	48	4	48	
8	48	1245	0.31	1.06	712.800	65		72	100	103	48	4	48	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			0.6252											
				Avg Sqrt Del H	Comments:									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET — EPA Method 0010 - Semi-Volatiles

Client: Chemours | Operator: MW MATT WEINKELER
Source: SemiWorks | Run No.: 2
Sample Loc.: Stack | Date: 3/23/18 | K Factor: 3.41

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1253			713.080			73	104		50			
B 1	3		0.40	1.36	715.100	63	NA	~~100~~	~~104~~	100	~~104~~	5	50	
1	6		0.40	1.36	716.74	65		73	100	100	50	5	50	
2	9		0.42	1.43	718.66	67		73	100	97	50	5	50	
2	12		0.42	1.43	720.56	67		74	100	99	50	5	50	
3	15		0.43	1.46	722.54	68		74	100	101	50	5	50	30.550
3	18		0.43	1.46	724.47	68		74	99	101	50	5	50	
4	21		0.43	1.46	726.50	68		74	99	101	50	5	50	
4	24		0.43	1.46	728.39	68		74	99	101	51	5	51	
5	27		0.41	1.39	730.31	68		75	99	102	52	5	52	
5	30		0.41	1.39	732.33	68		75	100	101	52	5	52	
6	33		0.37	1.26	734.34	68		76	101	100	53	5	52	
6	36		0.37	1.26	736.12	68		76	100	100	53	5	52	
7	39		0.35	1.19	738.27	67		76	100	102	53	5	53	
7	42		0.35	1.19	740.02	67		76	100	102	53	5	53	
8	45		0.30	1.02	741.83	67		76	100	101	53	5	52	
8	48	1341	0.30	1.02	743.630	63		76	100	102	53	5	51	
			Avg Sqrt Delta P: 0.62452	Avg Delta H: 1.33000	Total Volume: 60.895	Avg Ts: 66.4		Avg Tm: 72.7	Min/Max: 104	Min/Max: 1/5	Max Temp: 53	Max Vac: 5	Max Temp: 53	
				Avg Sqrt Del H: 1.15149	Comments:									

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - Semi-Volatiles

		Stack Conditions	Assumed	Actual					K Factor 3.41		
Client	Chemours				Meter Box ID	3a					
W.O.#	15418.002.002.0001				Meter Box Y	0.9890					
Project ID	Chemours	% Moisture	1.5		Meter Box Del H	1.9077		Leak Checks	Initial	Mid-Point	Final
Mode/Source ID	SemiWorks	Impinger Vol (ml)			Probe ID / Length	P696	5	Sample Train (ft^3)	0.001	0.001	0.001
Samp. Loc. ID	STK	Silica gel (g)			Probe Material	Boro		Leak Check @ (in Hg)	e15	-5	a6
Run No.ID	3	CO2, % by Vol	0.1		Pitot / Thermocouple ID	P696	P696	Pitot good	(yes) / no	(yes) / no	(yes) / no
Test Method ID	M0010	O2, % by Vol	20.8		Pitot Coefficient	0.84		Orsat good	(yes) / no	(yes) / no	(yes) / no
Date ID	22MAR2018	Temperature (°F)	62-78	MP	Nozzle ID	G235		Temp Check	Pre-Test Set		Post-Test Set
Source/Location	SemiWorks Stack	Meter Temp (°F)	72		Avg Nozzle Dia (in)	0.235		Meter Box Temp	64		67
Sample Date	3/23/18	Static Press (in H_2O)	-0.25	-0.25	Area of Stack (ft^2)	3.97		Reference Temp	64		67
Baro. Press (in Hg)	30.21				Sample Time	96		Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
Operator	MP MATT WINKLER	Ambient Temp (°F)	63		Total Traverse Pts	16		Temp Change Response	(yes) / no		(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1425			743.945									
A 1	3		0.45	1.53	745.80	68	NA	78	100	101	60	4	60	
1	6		0.45	1.53	747.87	68		78	100	100	58	4	58	
2	9		0.44	1.52	749.92	69		79	100	101	54	4	54	← K-Factor
2	12		0.44	1.52	751.93	69		79	100	102	54	4	54	3.46
3	15		0.44	1.52	753.96	68		80	100	104	54	4	54	
3	18		0.44	1.52	756.00	68		80	100	103	54	4	54	
4	21		0.43	1.48	758.06	68		80	100	99	56	4	56	
4	24		0.43	1.48	760.06	68		80	100	99	56	4	56	30.810
5	27		0.40	1.38	762.06	69		80	100	102	56	4	56	
5	30		0.40	1.38	763.98	69		80	100	102	56	4	56	
6	32		0.38	1.31	765.31	70		81	100	102	56	4	56	
6	36		0.38	1.31	767.84	70		81	100	102	56	4	56	
7	39		0.34	1.17	769.77	69		81	100	102	55	4	55	
7	42		0.34	1.17	771.44	69		82	100	102	55	4	54	
8	45		0.31	1.07	773.78	68		81	100	101	55	4	55	
8	48	1513	0.31	1.07	774.755	68		81	100	101	55	4	55	
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	

Avg Sqrt Del H

Comments:

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET — EPA Method 0010 - Semi-Volatiles

Client: Chemours | Operator: MW MASS WINKELER
Source: SemiWorks | Run No.: 3
Sample Loc.: Stack | Date: 3/23/18 | K Factor: 3.46

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1521			775.005									
1	3		0.44	1.50	776.90	69	N/A	81	100	100	56	4	56	
1	6		0.44	1.50	778.81	70		81	100	100	53	4	53	
2	9		0.43	1.48	781.14	70		80	100	102	53	4	53	
2	12		0.43	1.48	783.13	71		80	100	102	53	4	53	
3	15		0.42	1.45	784.91	71		80	100	102	53	4	53	30.095
3	18		0.42	1.45	786.75	71		80	100	102	53	4	53	
4	21		0.41	1.41	788.71	71		80	100	101	50	4	50	
4	24		0.41	1.41	790.68	71		80	100	101	50	4	50	
5	27		0.39	1.35	792.68	72		79	100	101	51	4	51	
5	30		0.39	1.35	794.60	72		79	100	101	51	4	51	
6	33		0.35	1.21	796.41	71		78	100	103	51	4	51	
6	36		0.35	1.21	798.20	71		78	100	103	51	4	51	
7	3940		0.33	1.14	800.00	71		78	100	101	51	4	51	
7	42		0.33	1.14	801.73	71		78	100	100	52	3	52	
8	45		0.31	1.07	803.88	71		78	100	100	53	3	53	
8	48	1609	0.31	1.07	805.100	71		78	105	100	53	3	53	
			Avg Sqrt Delta P: 0.62480	Avg Delta H: 1.34938	Total Volume: 60.905	Avg Ts: 69.8		Avg Tm: 79.7	Min/Max: 104	Min/Max: 104	Max Temp: 60	Max Vac: 4	Max Temp: 60	
				Avg Sqrt Del H: 1.15947	Comments:									

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Location	SemiWorks Stack

Run No. 1 — Sample Date 3/23/18 — Recovery Date 3/23/18

Sample I.D. Chemours - SemiWorks - STK - 1 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	0	101	100	1					314.3	
Initial	0	100	100	0					300	
Gain	1	1	0	1				3	14.3	17.3

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 2 — Sample Date 3/23/18 — Recovery Date 3/23/18

Sample I.D. Chemours - SemiWorks - STK - 2 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	1	99	103	3					315.5	
Initial	0	100	100	0					300	
Gain	1	-1	3	3				6	15.5	21.5

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Run No. 3 — Sample Date 3/23/18 — Recovery Date 3/23/18

Sample I.D. Chemours - SemiWorks - STK - 3 - M0010 - — Analyst [illegible] — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	1	87	115	4					315.2	
Initial	0	100	100	0					300	
Gain	1	-13	15	4				7	15.2	22.2

Impinger Color: clear — Labeled? ✓

Silica Gel Condition: Good — Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - Semi-Volatiles

Client	Chemours	W.O. #	15418.002.002.0001
Location/Plant	Fayetteville, NC	Source & Loaction	SemiWorks Stack

Run No. BT Sample Date 3/23/18 Recovery Date 3/23/18

Sample I.D. Chemours - SemiWorks - STK - BT - M0010 - 22MAR2(Analyst [illegible] Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	0	[illegible]	[illegible]	0					[illegible]	
Initial	0	100	100	0					300	
Gain	0	0	0	0				0	0.0	

Impinger Color Clear Labeled? ✓

Silica Gel Condition Good Sealed? ✓

Run No. — Sample Date _____ Recovery Date _____

Sample I.D. _____ Analyst _____ Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Run No. — Sample Date _____ Recovery Date _____

Sample I.D. _____ Analyst _____ Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Check COC for Sample IDs of Media Blanks

METHODS AND ANALYZERS

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

File: C:\DATA\Chemours\fayetteville\032318 semiworks.cem
Program Version: 2.1, built 19 May 2017 **File Version:** 2.02
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Start Time: 07:23

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC317774
21.0	SG9169108

Calibration Results

Zero	10 mv
Span, 21.0 %	8009 mv

Curve Coefficients

Slope	**Intercept**
380.9	10

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC317774
16.6	SG9169108

Calibration Results

Zero	18 mv
Span, 16.6 %	8289 mv

Curve Coefficients

Slope	**Intercept**
498.9	18

CALIBRATION ERROR DATA

Number 1

Client: **Chemors** | Project Number: **15418.002.002.**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Semi works** | Calibration **1** | Date: **23 Mar 2018**

Start Time: 07:23

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.9 **Intercept** 10.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %
Slope 498.9 **Intercept** 18.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client:	**Chemors**		Project Number: **15418.002.002.**
Location:	**Fayetteville, NC**		Operator: **SR**
Source:	**Semi works**	Calibration **1**	Date: **23 Mar 2018**

Start Time: 07:27

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
08:53	20.9	0.0
08:54	20.9	0.0
08:55	20.9	0.0
08:56	20.9	0.0
08:57	20.9	0.0
08:58	20.9	0.0
08:59	20.9	0.0
09:00	20.9	0.0
09:01	20.9	0.0
09:02	20.9	0.0
09:03	20.9	0.0
09:04	20.9	0.0
09:05	20.9	0.0
09:06	20.9	0.0
09:07	20.9	0.0
09:08	20.9	0.0
09:09	20.9	0.0
09:10	20.9	0.0
09:11	20.9	0.0
09:12	20.9	0.0
09:13	20.9	0.0
09:14	20.9	0.0
09:15	20.9	0.0
09:16	20.9	0.0
09:17	21.0	0.0
09:18	20.9	0.0
09:19	21.0	0.0
09:20	20.9	0.0
09:21	20.9	0.0
09:22	20.9	0.0
09:23	20.9	0.0
09:24	21.0	0.0
09:25	20.9	0.0
09:26	20.9	0.0
09:27	20.9	0.0
09:28	20.9	0.0
09:29	20.9	0.0
09:30	20.9	0.0
09:31	20.9	0.0
09:32	20.9	0.0

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
09:33	20.9	0.0
09:34	20.9	0.0
09:35	20.9	0.0
09:36	20.9	0.0
09:37	20.9	0.0
09:38	21.0	0.0
09:39	20.9	0.0
09:40	20.9	0.0
09:54	20.9	0.0
09:55	20.9	0.0
09:56	20.9	0.0
09:57	20.9	0.0
09:58	20.9	0.0
09:59	20.9	0.0
10:00	20.9	0.0
10:01	20.9	0.0
10:02	20.9	0.0
10:03	20.9	0.0
10:04	20.9	0.0
10:05	20.9	0.0
10:06	20.9	0.0
10:07	20.9	0.0
10:08	20.9	0.0
10:09	20.9	0.0
10:10	20.9	0.0
10:11	20.9	0.0
10:12	20.9	0.0
10:13	20.9	0.0
10:14	20.9	0.0
10:15	20.9	0.0
10:16	20.9	0.0
10:17	20.9	0.0
10:18	20.9	0.0
10:19	20.9	0.0
10:20	20.9	0.0
10:21	20.9	0.0
10:22	20.9	0.0
10:23	20.9	0.0
10:24	20.9	0.0
10:25	20.9	0.0

RUN DATA

Number 1

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
10:26	20.9	0.0
10:27	20.9	0.0
10:28	20.9	0.0
10:29	20.9	0.0
10:30	21.0	0.0
10:31	20.9	0.0
10:32	20.9	0.0
10:33	20.9	0.0
10:34	21.0	0.0
10:35	21.0	0.0
10:36	21.0	0.0
10:37	21.0	0.0
10:38	21.0	0.0
10:39	20.9	0.0
10:40	21.0	0.0
10:41	20.9	0.0
Avgs	**20.9**	**0.0**

RUN SUMMARY

Number 1

Client: **Chemors**		Project Number:	**15418.002.002.**
Location: **Fayetteville, NC**		Operator:	**SR**
Source: **Semi works**	Calibration **1**	Date:	**23 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 08:52 to 10:41

Run Averages

20.9	0.0

Pre-run Bias at 07:27

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 11:52

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client:	**Chemors**	Project Number:	**15418.002.002.**
Location:	**Fayetteville, NC**	Operator:	**SR**
Source:	**Semi works**	Calibration **1**	Date: **23 Mar 2018**

Start Time: 11:52

O_2

Method: EPA 3A

Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A

Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 1

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
11:58	20.9	0.0
11:59	20.9	0.0
12:00	20.9	0.0
12:01	20.9	0.0
12:02	20.9	0.0
12:03	20.9	0.0
12:04	20.9	0.0
12:05	20.9	0.0
12:06	20.9	0.0
12:07	20.9	0.0
12:08	20.9	0.0
12:09	20.9	0.0
12:10	20.9	0.0
12:11	20.9	0.0
12:12	20.9	0.0
12:13	20.9	0.0
12:14	20.9	0.0
12:15	20.9	0.0
12:16	20.9	0.0
12:17	20.9	0.0
12:18	20.9	0.0
12:19	20.9	0.0
12:20	20.9	0.0
12:21	20.9	0.0
12:22	20.9	0.0
12:23	20.9	0.0
12:24	20.9	0.0
12:25	20.9	0.0
12:26	20.9	0.0
12:27	20.9	0.0
12:28	20.9	0.0
12:29	20.9	0.0
12:30	20.9	0.0
12:31	20.9	0.0
12:32	20.9	0.0
12:33	20.9	0.0
12:34	20.9	0.0
12:35	20.9	0.0
12:36	20.9	0.0
12:37	20.9	0.0

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
12:38	20.9	0.0
12:39	20.9	0.0
12:40	20.9	0.0
12:41	20.9	0.0
12:42	20.9	0.0
12:43	20.9	0.0
12:44	20.9	0.0
12:45	20.9	0.0
12:54	20.9	0.0
12:55	20.9	0.0
12:56	20.9	0.0
12:57	20.9	0.0
12:58	20.9	0.0
12:59	20.9	0.0
13:00	20.9	0.0
13:01	20.9	0.0
13:02	20.9	0.0
13:03	20.9	0.0
13:04	20.9	0.0
13:05	20.9	0.0
13:06	20.9	0.0
13:07	20.9	0.0
13:08	20.9	0.0
13:09	20.9	0.0
13:10	20.9	0.0
13:11	20.9	0.0
13:12	20.9	0.0
13:13	20.9	0.0
13:14	20.9	0.0
13:15	20.9	0.0
13:16	20.9	0.0
13:17	20.9	0.0
13:18	20.9	0.0
13:19	20.9	0.0
13:20	20.9	0.0
13:21	20.9	0.0
13:22	20.9	0.0
13:23	20.9	0.0
13:24	20.9	0.0
13:25	20.9	0.0

RUN DATA

Number 2

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
13:26	20.9	0.0
13:27	20.9	0.0
13:28	20.9	0.0
13:29	20.9	0.0
13:30	20.9	0.0
13:31	20.9	0.0
13:32	20.9	0.0
13:33	20.9	0.0
13:34	20.9	0.0
13:35	20.9	0.0
13:36	20.9	0.0
13:37	20.9	0.0
13:38	20.9	0.0
13:39	20.9	0.0
13:40	20.9	0.0
13:41	20.9	0.0
Avgs	**20.9**	**0.0**

RUN SUMMARY

Number 2

Client: **Chemors** | Project Number: **15418.002.002.**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Semi works** | Calibration **1** | Date: **23 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 11:57 to 13:41

Run Averages

20.9	0.0

Pre-run Bias at 11:52

Zero Bias	0.0	0.0
Span Bias	12.0	8.5
Span Gas	12.0	8.9

Post-run Bias at 14:15

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemors** | Project Number: **15418.002.002.**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Semi works** | Calibration **1** | Date: **23 Mar 2018**

Start Time: 14:15

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.5	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.5	0.0	0.0	Pass

*Bias No. 2

RUN DATA

Number 3

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
14:26	20.8	0.0
14:27	20.8	0.0
14:28	20.8	0.0
14:29	20.8	0.0
14:30	20.8	0.0
14:31	20.8	0.0
14:32	20.8	0.0
14:33	20.8	0.0
14:34	20.8	0.0
14:35	20.8	0.0
14:36	20.8	0.0
14:37	20.8	0.0
14:38	20.8	0.0
14:39	20.9	0.0
14:40	20.9	0.0
14:41	20.9	0.0
14:42	20.9	0.0
14:43	20.8	0.0
14:44	20.8	0.0
14:45	20.8	0.0
14:46	20.8	0.0
14:47	20.8	0.0
14:48	20.8	0.0
14:49	20.8	0.0
14:50	20.9	0.0
14:51	20.8	0.0
14:52	20.9	0.0
14:53	20.8	0.0
14:54	20.8	0.0
14:55	20.9	0.0
14:56	20.9	0.0
14:57	20.9	0.0
14:58	20.9	0.0
14:59	20.8	0.0
15:00	20.9	0.0
15:01	20.8	0.0
15:02	20.8	0.0
15:03	20.9	0.0
15:04	20.8	0.0
15:05	20.8	0.0

RUN DATA

Number 3

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
15:06	20.8	0.0
15:07	20.9	0.0
15:08	20.9	0.0
15:09	20.9	0.0
15:10	20.9	0.0
15:11	20.9	0.0
15:12	20.9	0.0
15:13	20.9	0.0
15:22	20.8	0.0
15:23	20.8	0.0
15:24	20.8	0.0
15:25	20.8	0.0
15:26	20.8	0.0
15:27	20.8	0.0
15:28	20.8	0.0
15:29	20.8	0.0
15:30	20.8	0.0
15:31	20.8	0.0
15:32	20.8	0.0
15:33	20.8	0.0
15:34	20.8	0.0
15:35	20.8	0.0
15:36	20.8	0.0
15:37	20.8	0.0
15:38	20.8	0.0
15:39	20.8	0.0
15:40	20.8	0.0
15:41	20.8	0.0
15:42	20.8	0.0
15:43	20.8	0.0
15:44	20.8	0.0
15:45	20.8	0.0
15:46	20.8	0.0
15:47	20.8	0.0
15:48	20.8	0.0
15:49	20.8	0.0
15:50	20.8	0.0
15:51	20.8	0.0
15:52	20.8	0.0
15:53	20.8	0.0

RUN DATA

Number 3

Client: **Chemors**
Location: **Fayetteville, NC**
Source: **Semi works**

Calibration **1**

Project Number: **15418.002.002.**
Operator: **SR**
Date: **23 Mar 2018**

Time	O_2 %	CO_2 %
15:54	20.8	0.0
15:55	20.8	0.0
15:56	20.8	0.0
15:57	20.8	0.0
15:58	20.8	0.0
15:59	20.8	0.0
16:00	20.8	0.0
16:01	20.8	0.0
16:02	20.8	0.0
16:03	20.8	0.0
16:04	20.8	0.0
16:05	20.8	0.0
16:06	20.8	0.0
16:07	20.8	0.0
16:08	20.8	0.0
16:09	20.8	0.0
Avgs	**20.8**	**0.0**

RUN SUMMARY

Number 3

Client:	**Chemors**	Project Number:	**15418.002.002.**
Location:	**Fayetteville, NC**	Operator:	**SR**
Source:	**Semi works**	Calibration **1**	Date: **23 Mar 2018**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 14:25 to 16:09

Run Averages

20.8	0.0

Pre-run Bias at 14:15

Zero Bias	0.0	0.0
Span Bias	11.9	8.5
Span Gas	12.0	8.9

Post-run Bias at 16:14

Zero Bias	0.0	0.0
Span Bias	11.9	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Chemors** | Project Number: **15418.002.002.**
Location: **Fayetteville, NC** | Operator: **SR**
Source: **Semi works** | Calibration **1** | Date: **23 Mar 2018**

Start Time: 16:14

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.9	11.9	0.0	0.0	Pass

*Bias No. 3

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.5	8.4	-0.1	-0.6	Pass

*Bias No. 3

APPENDIX C
LABORATORY ANALYTICAL DESCRIPTION AND ANALYTICAL REPORT

Note: The analytical report is included on the attached CD.

TestAmerica HFPO-DA Method 0010 Sampling Train Fraction Preparation and Analysis Summary

The Method 0010 Sampling train fractions are transported from the Chemours Plant site in Fayetteville, NC to the TestAmerica Laboratory in Knoxville, TN for processing. The fractions are collected and recovered from the sampling train according to SW-846 additional guidelines found in Method 3542 for the breakdown of Method 0010 components. The train fraction designations are as follows:

- Front-Half Composite—consisting of a particulate filter, and a probe, nozzle and front portion of the filter holder bell housing glassware solvent rinses,
- Back-Half Composite—consisting of an XAD-2 resin module, and the back portion of the filter holder bell housing with connecting glassware solvent rinses,
- Condensate and Impinger Contents—consisting of the D.I. Water content used to initially charge the impingers and Condensate collected during the sampling run.
- Breakthrough XAD-2 Resin Tube—consisting of a standard XAD-2 module placed behind the Condensate Impingers as a final quality assurance indicator of the lack of breakthrough of the HFPO-DA through the sampling train.

In the laboratory, the Front-Half sample fraction components are placed in to an HDPE bottle and spiked with $^{13}C_3$-HFPO isotope dilution internal standard (IDA). This composite is extracted with basic methanol for 18 hours at room temperature followed by acidification using formic acid. The final formulation is filtered through a 0.45 µm filter and analyzed by Method 8321A for HFPO-DA. Instrumental analysis for these extracts is conducted in the TestAmerica Denver Laboratory.

The Back-Half sample fraction components, including the approximately 40 grams of XAD-2 resin material, are transferred to an HDPE bottle and spiked with the IDA internal standard. This Back-Half Composite is extracted at room temperature using two (2) successive 18 hour periods and separate portions of basic methanol. The XAD-2 resin material is removed, and the extraction fluid is acidified using formic acid. The final formulation is filtered through a 0.45 µm filter and analyzed by Method 8321A for HFPO-DA in the TestAmerica Denver Laboratory.

The Condensate Composite fraction of the sampling train is measured to record the total volume in the composite followed by preparation by concentration on a solid phase extractor (SPE). The SPE cartridge is treated with water/methanol mixture to release the HFPO-DA. The extract is run for the HFPO-DA using Method 8321A.

The Breakthrough XAD-2 Resin Tube fraction is prepared and analyzed by the same process as that used for the Back-half sampling train fraction.

Due to the sensitivity of the LCMS methodology, concentrations levels collected on Method 0010 sampling trains of HFPO-DA may require significant dilutions in order to report analytical data that is "hard quantified" within the calibration range of the process. The diluted samples avoid "E" (estimated) values for the results of the HFPO-DA.

ANALYTICAL REPORT

Job Number: 140-11033-1

Job Description: Fayetteville Division Vent - M0010

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager I
4/11/2018 2:15 PM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
04/11/2018

Table of Contents

Table of Contents

Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Division Vent - M0010

TestAmerica Job ID: 140-11033-1

Method	Method Description	Protocol	Laboratory
8321A	PFOA and PFOS	SW846	TAL DEN
8321A	HFPO-DA	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Division Vent - M0010

TestAmerica Job ID: 140-11033-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-11033-1	E-1201,1202 M0010 RUN 1 FH	Air	03/19/18 00:00	03/22/18 16:07
140-11033-2	E-1203,1204,1206 M0010 RUN 1 BH	Air	03/19/18 00:00	03/22/18 16:07
140-11033-3	E-1205, M0010 RUN 1 COND	Air	03/19/18 00:00	03/22/18 16:07
140-11033-4	E-1207, M0010 RUN 1 XAD-2	Air	03/19/18 00:00	03/22/18 16:07
140-11033-5	E-1208,1209, M0010 RUN 2 FH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-6	E-1210,1211,1213 M0010 RUN 2 BH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-7	E-1212 M0010 RUN 2 COND	Air	03/20/18 00:00	03/22/18 16:07
140-11033-8	E-1214 M0010 RUN 2 XAD-2	Air	03/20/18 00:00	03/22/18 16:07
140-11033-9	E-1215,1216 M0010 RUN 3 FH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-10	E-1217,1218,1220 M0010 RUN 3 BH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-11	E-1219 M0010 RUN 3 COND	Air	03/20/18 00:00	03/22/18 16:07
140-11033-12	E-1221 M0010 RUN 3 XAD-2	Air	03/20/18 00:00	03/22/18 16:07
140-11033-13	E-1222,1223 M0010 QC RUN BT FH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-14	E-1224,1225,1227 M0010 QC RUN BT BH	Air	03/20/18 00:00	03/22/18 16:07
140-11033-15	E-1226 M0010 QC RUN BT COND	Air	03/20/18 00:00	03/22/18 16:07
140-11033-16	E-1228 M0010 QC RUN BT XAD-2	Air	03/20/18 00:00	03/22/18 16:07
140-11033-17	E-1229 M0010 QC DI WATER RB	Air	03/20/18 00:00	03/22/18 16:07
140-11033-18	E-1230 M0010 QC MEOH WITH 5% NH4OH RB	Air	03/20/18 00:00	03/22/18 16:07
140-11033-19	E-1231 M0010 QC XAD-2 RESIN TUBE RB	Air	03/20/18 00:00	03/22/18 16:07
140-11033-20	E-1232 M0010 QC MEOH WITH 5% NH4OH TB	Air	03/20/18 00:00	03/22/18 16:07
140-11033-21	E-1233 M0010 QC XAD-2 RESIN TUBE TB	Air	03/20/18 00:00	03/22/18 16:07
140-11033-22	E-1236 M0010 QC MEOH/5% HN4OH RINSE PB	Air	03/19/18 00:00	03/22/18 16:07

Job Narrative
140-11033-1

Sample Receipt

The samples were received on March 22, 2018 at 4:07 PM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 0.1º C and 0.6º C.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Method 0010/Method 3542 Sampling Train Preparation

Train fractions were extracted and prepared for analysis in TestAmerica's Knoxville laboratory. Extracts and condensate samples were forwarded to the Denver laboratory for HFPO-DA analysis. All results are reported in "Total ug" per sample.

LCMS

Method 8321A: The Surrogate/Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit:

E-1226 M0010 QC RUN BT COND (140-11033-15)
E-1233 M0010 QC XAD-2 RESIN TUBE TB (140-11033-21
E-1208,1209, M0010 RUN 2 FH (140-11033-5)

Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. All detection limits are below the lower calibration.

Comments

Reporting Limits (RLs) and Method Detection Limits (MDLs) for the HFPO-DA used in this report were derived in Denver for reporting soils and water samples. Method 0010 sampling train matrix specific RLs and MDLs have not been established for HFPO-DA. The soil and water limits are expected to be reasonable approximations of the actual matrix specific limits, under these conditions.

The expanded deliverable section of the package is split into two sections: 8321A_HFPO_DU is specific to condensates, and Method DV-LC-0012 contains the XAD and Filter data. Both methods share the same calibration on 10/10/17. A single instance of this calibration and the associated detection limit check (DLCK) and Initial calibration verification (ICV) can be found in the 8321A_HFPO_DU section of the package as part of our automated package generation procedures.

LCMS

Analysis Batch: 404345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-404345/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 408819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-1	E-1201,1202 M0010 RUN 1 FH	Total/NA	Air	None	
140-11033-5	E-1208,1209, M0010 RUN 2 FH	Total/NA	Air	None	
140-11033-9	E-1215,1216 M0010 RUN 3 FH	Total/NA	Air	None	
140-11033-13	E-1222,1223 M0010 QC RUN BT FH	Total/NA	Air	None	
MB 280-408819/1-A	Method Blank	Total/NA	Air	None	
LCS 280-408819/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 408820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-2	E-1203,1204,1206 M0010 RUN 1 BH	Total/NA	Air	None	
140-11033-4	E-1207, M0010 RUN 1 XAD-2	Total/NA	Air	None	
140-11033-6	E-1210,1211,1213 M0010 RUN 2 BH	Total/NA	Air	None	
140-11033-8	E-1214 M0010 RUN 2 XAD-2	Total/NA	Air	None	
140-11033-10	E-1217,1218,1220 M0010 RUN 3 BH	Total/NA	Air	None	
140-11033-12	E-1221 M0010 RUN 3 XAD-2	Total/NA	Air	None	
140-11033-14	E-1224,1225,1227 M0010 QC RUN BT BH	Total/NA	Air	None	
140-11033-16	E-1228 M0010 QC RUN BT XAD-2	Total/NA	Air	None	
140-11033-18	E-1230 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	None	
140-11033-19	E-1231 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	None	
140-11033-20	E-1232 M0010 QC MEOH WITH 5% NH4OH TB	Total/NA	Air	None	
140-11033-21	E-1233 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	None	
140-11033-22	E-1236 M0010 QC MEOH/5% HN4OH RINSE PE	Total/NA	Air	None	
MB 280-408820/1-A	Method Blank	Total/NA	Air	None	
LCS 280-408820/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 408821

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-3	E-1205, M0010 RUN 1 COND	Total/NA	Air	None	
140-11033-7	E-1212 M0010 RUN 2 COND	Total/NA	Air	None	
140-11033-11	E-1219 M0010 RUN 3 COND	Total/NA	Air	None	
140-11033-15	E-1226 M0010 QC RUN BT COND	Total/NA	Air	None	
140-11033-17	E-1229 M0010 QC DI WATER RB	Total/NA	Air	None	
MB 280-408821/1-A	Method Blank	Total/NA	Air	None	
LCS 280-408821/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-408821/8-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-408821/9-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409004

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-2 - REDL	E-1203,1204,1206 M0010 RUN 1 BH	Total/NA	Air	None	
140-11033-6 - REDL	E-1210,1211,1213 M0010 RUN 2 BH	Total/NA	Air	None	
140-11033-10 - REDL	E-1217,1218,1220 M0010 RUN 3 BH	Total/NA	Air	None	

Analysis Batch: 409693

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-1	E-1201,1202 M0010 RUN 1 FH	Total/NA	Air	8321A	408819
140-11033-5	E-1208,1209, M0010 RUN 2 FH	Total/NA	Air	8321A	408819

LCMS (Continued)

Analysis Batch: 409693 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-9	E-1215,1216 M0010 RUN 3 FH	Total/NA	Air	8321A	408819
140-11033-13	E-1222,1223 M0010 QC RUN BT FH	Total/NA	Air	8321A	408819
MB 280-408819/1-A	Method Blank	Total/NA	Air	8321A	408819
LCS 280-408819/2-A	Lab Control Sample	Total/NA	Air	8321A	408819

Analysis Batch: 409695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-2 - REDL	E-1203,1204,1206 M0010 RUN 1 BH	Total/NA	Air	8321A	409004
140-11033-6 - REDL	E-1210,1211,1213 M0010 RUN 2 BH	Total/NA	Air	8321A	409004
140-11033-10 - REDL	E-1217,1218,1220 M0010 RUN 3 BH	Total/NA	Air	8321A	409004

Analysis Batch: 409696

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-1	E-1201,1202 M0010 RUN 1 FH	Total/NA	Air	8321A	408819
140-11033-5	E-1208,1209, M0010 RUN 2 FH	Total/NA	Air	8321A	408819
140-11033-9	E-1215,1216 M0010 RUN 3 FH	Total/NA	Air	8321A	408819

Analysis Batch: 409697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-2	E-1203,1204,1206 M0010 RUN 1 BH	Total/NA	Air	8321A	408820
140-11033-4	E-1207, M0010 RUN 1 XAD-2	Total/NA	Air	8321A	408820
140-11033-6	E-1210,1211,1213 M0010 RUN 2 BH	Total/NA	Air	8321A	408820
140-11033-8	E-1214 M0010 RUN 2 XAD-2	Total/NA	Air	8321A	408820
140-11033-10	E-1217,1218,1220 M0010 RUN 3 BH	Total/NA	Air	8321A	408820
140-11033-12	E-1221 M0010 RUN 3 XAD-2	Total/NA	Air	8321A	408820
140-11033-14	E-1224,1225,1227 M0010 QC RUN BT BH	Total/NA	Air	8321A	408820
140-11033-16	E-1228 M0010 QC RUN BT XAD-2	Total/NA	Air	8321A	408820
140-11033-18	E-1230 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	8321A	408820
140-11033-19	E-1231 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	8321A	408820
140-11033-20	E-1232 M0010 QC MEOH WITH 5% NH4OH TB	Total/NA	Air	8321A	408820
140-11033-21	E-1233 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	8321A	408820
140-11033-22	E-1236 M0010 QC MEOH/5% HN4OH RINSE PE	Total/NA	Air	8321A	408820
MB 280-408820/1-A	Method Blank	Total/NA	Air	8321A	408820
LCS 280-408820/2-A	Lab Control Sample	Total/NA	Air	8321A	408820

Analysis Batch: 410189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11033-3	E-1205, M0010 RUN 1 COND	Total/NA	Air	8321A	408821
140-11033-7	E-1212 M0010 RUN 2 COND	Total/NA	Air	8321A	408821
140-11033-11	E-1219 M0010 RUN 3 COND	Total/NA	Air	8321A	408821
140-11033-15	E-1226 M0010 QC RUN BT COND	Total/NA	Air	8321A	408821
140-11033-17	E-1229 M0010 QC DI WATER RB	Total/NA	Air	8321A	408821
MB 280-408821/1-A	Method Blank	Total/NA	Air	8321A	408821
LCS 280-408821/2-A	Lab Control Sample	Total/NA	Air	8321A	408821
LCSD 280-408821/8-A	Lab Control Sample Dup	Total/NA	Air	8321A	408821
LLCS 280-408821/9-A	Lab Control Sample	Total/NA	Air	8321A	408821

Client Sample ID: E-1201,1202 M0010 RUN 1 FH

Lab Sample ID: 140-11033-1
Matrix: Air
Date Collected: 03/19/18 00:00
Date Received: 03/22/18 16:07
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	55.5	E	0.150	0.150	ug/Sample		03/23/18 06:33	03/30/18 08:54	1
HFPO-DA	55.5		0.750	0.750	ug/Sample		03/23/18 06:33	03/30/18 10:19	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*62*		*50 - 200*	*03/23/18 06:33*	*03/30/18 08:54*	*1*
13C3 HFPO-DA	*76*	*D*	*50 - 200*	*03/23/18 06:33*	*03/30/18 10:19*	*5*

Client Sample ID: E-1203,1204,1206 M0010 RUN 1 BH

Lab Sample ID: 140-11033-2
Matrix: Air
Date Collected: 03/19/18 00:00
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	943		10.0	10.0	ug/Sample		03/23/18 06:38	03/30/18 10:39	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*73*	*D*	*50 - 200*	*03/23/18 06:38*	*03/30/18 10:39*	*50*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	946		10.0	10.0	ug/Sample		03/26/18 07:42	03/30/18 10:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*50 - 200*	*03/26/18 07:42*	*03/30/18 10:06*	*1*

Client Sample ID: E-1205, M0010 RUN 1 COND

Lab Sample ID: 140-11033-3
Matrix: Air
Date Collected: 03/19/18 00:00
Date Received: 03/22/18 16:07
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0125	J	0.0500	0.00255	ug/Sample		04/03/18 19:00	04/04/18 09:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*74*		*50 - 200*	*04/03/18 19:00*	*04/04/18 09:17*	*1*

Client Sample ID: E-1207, M0010 RUN 1 XAD-2

Lab Sample ID: 140-11033-4
Matrix: Air
Date Collected: 03/19/18 00:00
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 10:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*62*		*50 - 200*	*03/23/18 06:38*	*03/30/18 10:42*	*1*

Client Sample ID: E-1208,1209, M0010 RUN 2 FH

Lab Sample ID: 140-11033-5

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	143	E	0.0750	0.0750	ug/Sample		03/23/18 06:33	03/30/18 08:58	1
HFPO-DA	146		1.50	1.50	ug/Sample		03/23/18 06:33	03/30/18 10:22	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*37*	*X*	*50 - 200*	*03/23/18 06:33*	*03/30/18 08:58*	*1*
13C3 HFPO-DA	*74*	*D*	*50 - 200*	*03/23/18 06:33*	*03/30/18 10:22*	*20*

Client Sample ID: E-1210,1211,1213 M0010 RUN 2 BH

Lab Sample ID: 140-11033-6

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	75.1		1.00	1.00	ug/Sample		03/23/18 06:38	03/30/18 10:45	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*52*	*D*	*50 - 200*	*03/23/18 06:38*	*03/30/18 10:45*	*5*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	58.1		10.0	10.0	ug/Sample		03/26/18 07:42	03/30/18 10:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*78*		*50 - 200*	*03/26/18 07:42*	*03/30/18 10:09*	*1*

Client Sample ID: E-1212 M0010 RUN 2 COND

Lab Sample ID: 140-11033-7

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0430	J	0.0500	0.00255	ug/Sample		04/03/18 19:00	04/04/18 09:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*69*		*50 - 200*	*04/03/18 19:00*	*04/04/18 09:20*	*1*

Client Sample ID: E-1214 M0010 RUN 2 XAD-2

Lab Sample ID: 140-11033-8

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 10:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*65*		*50 - 200*	*03/23/18 06:38*	*03/30/18 10:48*	*1*

Client Sample ID: E-1215,1216 M0010 RUN 3 FH

Lab Sample ID: 140-11033-9

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	40.7	E	0.100	0.100	ug/Sample		03/23/18 06:33	03/30/18 09:01	1
HFPO-DA	40.6		0.500	0.500	ug/Sample		03/23/18 06:33	03/30/18 10:25	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*61*		*50 - 200*	*03/23/18 06:33*	*03/30/18 09:01*	*1*
13C3 HFPO-DA	*78*	*D*	*50 - 200*	*03/23/18 06:33*	*03/30/18 10:25*	*5*

Client Sample ID: E-1217,1218,1220 M0010 RUN 3 BH

Lab Sample ID: 140-11033-10

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	97.9		1.00	1.00	ug/Sample		03/23/18 06:38	03/30/18 10:51	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*58*	*D*	*50 - 200*	*03/23/18 06:38*	*03/30/18 10:51*	*5*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	78.9		10.0	10.0	ug/Sample		03/26/18 07:42	03/30/18 10:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*50 - 200*	*03/26/18 07:42*	*03/30/18 10:12*	*1*

Client Sample ID: E-1219 M0010 RUN 3 COND

Lab Sample ID: 140-11033-11

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0565		0.0500	0.00255	ug/Sample		04/03/18 19:00	04/04/18 09:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*69*		*50 - 200*	*04/03/18 19:00*	*04/04/18 09:23*	*1*

Client Sample ID: E-1221 M0010 RUN 3 XAD-2

Lab Sample ID: 140-11033-12

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 10:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*65*		*50 - 200*	*03/23/18 06:38*	*03/30/18 10:55*	*1*

Client Sample ID: E-1222,1223 M0010 QC RUN BT FH

Lab Sample ID: 140-11033-13

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.853		0.0250	0.0250	ug/Sample		03/23/18 06:33	03/30/18 09:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*68*		*50 - 200*	*03/23/18 06:33*	*03/30/18 09:04*	*1*

Client Sample ID: E-1224,1225,1227 M0010 QC RUN BT BH

Lab Sample ID: 140-11033-14

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.465		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 10:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*52*		*50 - 200*	*03/23/18 06:38*	*03/30/18 10:58*	*1*

Client Sample ID: E-1226 M0010 QC RUN BT COND

Lab Sample ID: 140-11033-15

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0120		0.00250	0.000128	ug/Sample		04/03/18 19:00	04/04/18 09:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*26*	*X*	*50 - 200*	*04/03/18 19:00*	*04/04/18 09:26*	*1*

Client Sample ID: E-1228 M0010 QC RUN BT XAD-2

Lab Sample ID: 140-11033-16

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 11:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*66*		*50 - 200*	*03/23/18 06:38*	*03/30/18 11:01*	*1*

Client Sample ID: E-1229 M0010 QC DI WATER RB

Lab Sample ID: 140-11033-17

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		04/03/18 19:00	04/04/18 09:30	1

Client Sample ID: E-1229 M0010 QC DI WATER RB

Lab Sample ID: 140-11033-17

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 250ml - unpreserved

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*71*		*50 - 200*	*04/03/18 19:00*	*04/04/18 09:30*	*1*

Client Sample ID: E-1230 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-11033-18

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/23/18 06:38	03/30/18 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*81*		*50 - 200*	*03/23/18 06:38*	*03/30/18 11:08*	*1*

Client Sample ID: E-1231 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-11033-19

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 11:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*55*		*50 - 200*	*03/23/18 06:38*	*03/30/18 11:11*	*1*

Client Sample ID: E-1232 M0010 QC MEOH WITH 5% NH4OH TB

Lab Sample ID: 140-11033-20

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/23/18 06:38	03/30/18 11:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*80*		*50 - 200*	*03/23/18 06:38*	*03/30/18 11:14*	*1*

Client Sample ID: E-1233 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-11033-21

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 11:17	1

Client Sample ID: E-1233 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-11033-21

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: XAD Resin Tube - Large

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	20	X	50 - 200	03/23/18 06:38	03/30/18 11:17	1

Client Sample ID: E-1236 M0010 QC MEOH/5% HN4OH RINSE PB

Lab Sample ID: 140-11033-22

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.134		0.0250	0.0250	ug/Sample		03/23/18 06:38	03/30/18 11:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	78		50 - 200	03/23/18 06:38	03/30/18 11:21	1

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Division Vent - M0010

TestAmerica Job ID: 140-11033-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.00250	0.00128	ug/Sample	8321A

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.0250	0.0250	ug/Sample	8321A
HFPO-DA	0.100	0.100	ug/Sample	8321A

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Division Vent - M0010

TestAmerica Job ID: 140-11033-1

Method: 8321A - HFPO-DA

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11033-3	E-1205, M0010 RUN 1 COND	74
140-11033-7	E-1212 M0010 RUN 2 COND	69
140-11033-11	E-1219 M0010 RUN 3 COND	69
140-11033-15	E-1226 M0010 QC RUN BT COI	26 X
140-11033-17	E-1229 M0010 QC DI WATER F	71
LCS 280-408821/2-A	Lab Control Sample	69
LCSD 280-408821/8-A	Lab Control Sample Dup	71
LLCS 280-408821/9-A	Lab Control Sample	73
MB 280-408821/1-A	Method Blank	70

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - PFOA and PFOS

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11033-1	E-1201,1202 M0010 RUN 1 FH	62
140-11033-1	E-1201,1202 M0010 RUN 1 FH	76 D
140-11033-2 - REDL	E-1203,1204,1206 M0010 RUN	76
140-11033-2	E-1203,1204,1206 M0010 RUN	73 D
140-11033-4	E-1207, M0010 RUN 1 XAD-2	62
140-11033-5	E-1208,1209, M0010 RUN 2 FH	37 X
140-11033-5	E-1208,1209, M0010 RUN 2 FH	74 D
140-11033-6 - REDL	E-1210,1211,1213 M0010 RUN	78
140-11033-6	E-1210,1211,1213 M0010 RUN	52 D
140-11033-8	E-1214 M0010 RUN 2 XAD-2	65
140-11033-9	E-1215,1216 M0010 RUN 3 FH	61
140-11033-9	E-1215,1216 M0010 RUN 3 FH	78 D
140-11033-10 - REDL	E-1217,1218,1220 M0010 RUN	76
140-11033-10	E-1217,1218,1220 M0010 RUN	58 D
140-11033-12	E-1221 M0010 RUN 3 XAD-2	65
140-11033-13	E-1222,1223 M0010 QC RUN B	68
140-11033-14	E-1224,1225,1227 M0010 QC R	52
140-11033-16	E-1228 M0010 QC RUN BT XAI	66
140-11033-18	E-1230 M0010 QC MEOH WITH	81
140-11033-19	E-1231 M0010 QC XAD-2 RESI	55
140-11033-20	E-1232 M0010 QC MEOH WITH	80
140-11033-21	E-1233 M0010 QC XAD-2 RESI	20 X
140-11033-22	E-1236 M0010 QC MEOH/5% H	78
DLCK 280-404345/13	Lab Control Sample	104
LCS 280-408819/2-A	Lab Control Sample	69
LCS 280-408820/2-A	Lab Control Sample	55
MB 280-408819/1-A	Method Blank	68
MB 280-408820/1-A	Method Blank	54

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-408821/1-A
Matrix: Air
Analysis Batch: 410189

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408821

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		04/03/18 19:00	04/04/18 09:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*70*		*50 - 200*	*04/03/18 19:00*	*04/04/18 09:04*	*1*

Lab Sample ID: LCS 280-408821/2-A
Matrix: Air
Analysis Batch: 410189

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408821

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.05564		ug/Sample		111	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*69*		*50 - 200*

Lab Sample ID: LCSD 280-408821/8-A
Matrix: Air
Analysis Batch: 410189

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 408821

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.05389		ug/Sample		108	50 - 150	3	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*71*		*50 - 200*

Lab Sample ID: LLCS 280-408821/9-A
Matrix: Air
Analysis Batch: 410189

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408821

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.005871		ug/Sample		117	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*73*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-404345/13
Matrix: Air
Analysis Batch: 404345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.250	0.2255		ug/L		90	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*104*		*50 - 200*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-408819/1-A
Matrix: Air
Analysis Batch: 409693

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408819

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/23/18 06:33	03/30/18 08:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*68*		*50 - 200*	*03/23/18 06:33*	*03/30/18 08:48*	*1*

Lab Sample ID: LCS 280-408819/2-A
Matrix: Air
Analysis Batch: 409693

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408819

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.4401		ug/Sample		88	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*69*		*50 - 200*

Lab Sample ID: MB 280-408820/1-A
Matrix: Air
Analysis Batch: 409697

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408820

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/23/18 06:38	03/30/18 10:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*54*		*50 - 200*	*03/23/18 06:38*	*03/30/18 10:32*	*1*

Lab Sample ID: LCS 280-408820/2-A
Matrix: Air
Analysis Batch: 409697

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408820

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.710		ug/Sample		93	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*55*		*50 - 200*

Client Sample ID: E-1201,1202 M0010 RUN 1 FH

Lab Sample ID: 140-11033-1

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	300 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		1			409693	03/30/18 08:54	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	300 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		5			409696	03/30/18 10:19	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1203,1204,1206 M0010 RUN 1 BH

Lab Sample ID: 140-11033-2

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409004	03/26/18 07:42		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409695	03/30/18 10:06	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		50			409697	03/30/18 10:39	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1205, M0010 RUN 1 COND

Lab Sample ID: 140-11033-3

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:17	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1207, M0010 RUN 1 XAD-2

Lab Sample ID: 140-11033-4

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:42	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1208,1209, M0010 RUN 2 FH

Lab Sample ID: 140-11033-5

Date Collected: 03/20/18 00:00

Matrix: Air

Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	150 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		1			409693	03/30/18 08:58	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	150 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		20			409696	03/30/18 10:22	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1210,1211,1213 M0010 RUN 2 BH

Lab Sample ID: 140-11033-6

Date Collected: 03/20/18 00:00

Matrix: Air

Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409004	03/26/18 07:42		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409695	03/30/18 10:09	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		5			409697	03/30/18 10:45	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1212 M0010 RUN 2 COND

Lab Sample ID: 140-11033-7

Date Collected: 03/20/18 00:00

Matrix: Air

Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1214 M0010 RUN 2 XAD-2

Lab Sample ID: 140-11033-8

Date Collected: 03/20/18 00:00

Matrix: Air

Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:48	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1215,1216 M0010 RUN 3 FH

Lab Sample ID: 140-11033-9

Date Collected: 03/20/18 00:00

Matrix: Air

Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	200 mL	408819	03/23/18 06:33		TAL DEN

Client Sample ID: E-1215,1216 M0010 RUN 3 FH

Lab Sample ID: 140-11033-9
Matrix: Air
Date Collected: 03/20/18 00:00
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			409693	03/30/18 09:01	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	200 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		5			409696	03/30/18 10:25	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1217,1218,1220 M0010 RUN 3 BH

Lab Sample ID: 140-11033-10
Matrix: Air
Date Collected: 03/20/18 00:00
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409004	03/26/18 07:42		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409695	03/30/18 10:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		5			409697	03/30/18 10:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1219 M0010 RUN 3 COND

Lab Sample ID: 140-11033-11
Matrix: Air
Date Collected: 03/20/18 00:00
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:23	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1221 M0010 RUN 3 XAD-2

Lab Sample ID: 140-11033-12
Matrix: Air
Date Collected: 03/20/18 00:00
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:55	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1222,1223 M0010 QC RUN BT FH

Lab Sample ID: 140-11033-13
Matrix: Air
Date Collected: 03/20/18 00:00
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408819	03/23/18 06:33		TAL DEN

Client Sample ID: E-1222,1223 M0010 QC RUN BT FH — Lab Sample ID: 140-11033-13

Date Collected: 03/20/18 00:00 — **Matrix: Air**
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			409693	03/30/18 09:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1224,1225,1227 M0010 QC RUN BT BH — Lab Sample ID: 140-11033-14

Date Collected: 03/20/18 00:00 — **Matrix: Air**
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:58	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1226 M0010 QC RUN BT COND — Lab Sample ID: 140-11033-15

Date Collected: 03/20/18 00:00 — **Matrix: Air**
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:26	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1228 M0010 QC RUN BT XAD-2 — Lab Sample ID: 140-11033-16

Date Collected: 03/20/18 00:00 — **Matrix: Air**
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:01	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1229 M0010 QC DI WATER RB — Lab Sample ID: 140-11033-17

Date Collected: 03/20/18 00:00 — **Matrix: Air**
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1230 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-11033-18

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1231 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-11033-19

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:11	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1232 M0010 QC MEOH WITH 5% NH4OH TB

Lab Sample ID: 140-11033-20

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:14	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1233 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-11033-21

Date Collected: 03/20/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:17	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-1236 M0010 QC MEOH/5% HN4OH RINSE PB

Lab Sample ID: 140-11033-22

Date Collected: 03/19/18 00:00
Matrix: Air
Date Received: 03/22/18 16:07

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 11:21	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-408819/1-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		1			409693	03/30/18 08:48	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-408820/1-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:32	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-408821/1-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-404345/13
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			404345	02/08/18 13:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-408819/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	408819	03/23/18 06:33		TAL DEN
Total/NA	Analysis	8321A		1			409693	03/30/18 08:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-408820/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	408820	03/23/18 06:38		TAL DEN
Total/NA	Analysis	8321A		1			409697	03/30/18 10:35	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-408821/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:07	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-408821/8-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:10	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LLCS 280-408821/9-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	408821	04/03/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410189	04/04/18 09:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Laboratory References:
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Division Vent - M0010

TestAmerica Job ID: 140-11033-1

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-18
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-19
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-18
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-18
Kentucky (DW)	State Program	4	90101	12-31-18
Louisiana	NELAP	6	83979	06-30-18
Louisiana (DW)	NELAP	6	LA160005	12-31-18
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-18
New Jersey	NELAP	2	TN001	06-30-18
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-18
North Carolina (WW/SW)	State Program	4	64	12-31-18
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-18
Oregon	NELAP	10	TNI0189	01-01-19
Pennsylvania	NELAP	3	68-00576	12-31-18
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-18
US Fish & Wildlife	Federal		LE-058448-0	07-31-18
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-18
Virginia	NELAP	3	460176	09-14-18
Washington	State Program	10	C593	01-19-19
West Virginia (DW)	State Program	3	9955C	12-31-18
West Virginia DEP	State Program	3	345	04-30-18
Wisconsin	State Program	5	998044300	08-31-18

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18 *
Illinois	NELAP	5	200017	04-30-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Denver (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11033-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 404345

Lab Sample ID: STD001 280-404345/3 IC Client Sample ID:

Date Analyzed: 02/08/18 13:05 Lab File ID: hfpo718B08034.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Assign Peak	meyera	02/08/18 15:19

Lab Sample ID: STD002 280-404345/4 IC Client Sample ID:

Date Analyzed: 02/08/18 13:08 Lab File ID: hfpo718B08035.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:19

Lab Sample ID: DLCK 280-404345/13 Client Sample ID:

Date Analyzed: 02/08/18 13:38 Lab File ID: hfpo718B08044.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11033-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 410189

Lab Sample ID: 140-11033-3 Client Sample ID: E-1205, M0010 RUN 1 COND

Date Analyzed: 04/04/18 09:17 Lab File ID: hfpo718D04025.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.96	Baseline	meyera	04/04/18 12:24

ANALYTICAL REPORT

Job Number: 140-11058-1

Job Description: Fayetteville Semi Works Stack - M0010

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager I
4/11/2018 2:16 PM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
04/11/2018

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Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Semi Works Stack - M0010

TestAmerica Job ID: 140-11058-1

Method	Method Description	Protocol	Laboratory
8321A	PFOA and PFOS	SW846	TAL DEN
8321A	HFPO-DA	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Semi Works Stack - M0010

TestAmerica Job ID: 140-11058-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-11058-1	Q-1801,1802 M0010 RUN 1 FH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-2	Q-1803,1804,1806 M0010 RUN 1 BH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-3	Q-1805 M0010 RUN 1 COND	Air	03/23/18 00:00	03/24/18 11:40
140-11058-4	Q-1807 M0010 RUN 1 XAD-2	Air	03/23/18 00:00	03/24/18 11:40
140-11058-5	Q-1808,1809 M0010 RUN 2 FH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-6	Q-1810,1811,1813 M0010 RUN 2 BH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-7	Q-1812 M0010 RUN 2 COND	Air	03/23/18 00:00	03/24/18 11:40
140-11058-8	Q-1814 M0010 RUN 2 XAD-2	Air	03/23/18 00:00	03/24/18 11:40
140-11058-9	Q-1815,1816 M0010 RUN 3 FH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-10	Q-1817,1818,1820 M0010 RUN 3 BH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-11	Q-1819 M0010 RUN 3 COND	Air	03/23/18 00:00	03/24/18 11:40
140-11058-12	Q-1821 M0010 RUN 3 XAD-2	Air	03/23/18 00:00	03/24/18 11:40
140-11058-13	Q-1822,1823 M0010 QC RUN BT FH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-14	Q-1824,1825,1827 M0010 QC RUN BT BH	Air	03/23/18 00:00	03/24/18 11:40
140-11058-15	Q-1826 M0010 QC RUN BT COND	Air	03/23/18 00:00	03/24/18 11:40
140-11058-16	Q-1828 M0010 QC RUN BT XAD-2	Air	03/23/18 00:00	03/24/18 11:40
140-11058-17	Q-1829 M0010 QC DI WATER RB	Air	03/23/18 00:00	03/24/18 11:40
140-11058-18	Q-1830 M0010 QC MEOH WITH 5%/NH4OH RB	Air	03/23/18 00:00	03/24/18 11:40
140-11058-19	Q-1831 M0010 QC XAD-2 RB	Air	03/23/18 00:00	03/24/18 11:40
140-11058-20	Q-1832 M0010 QC MEOH WITH 5%/NH4OH TB	Air	03/23/18 00:00	03/24/18 11:40
140-11058-21	Q-1833 M0010 QC XAD-2 TB	Air	03/23/18 00:00	03/24/18 11:40
140-11058-22	Q-1836 M0010 QC IMP MEOH/5% NH4OH RINSE PB	Air	03/23/18 00:00	03/24/18 11:40

Job Narrative
140-11058-1

Sample Receipt

The samples were received on March 24, 2018 at 11:40 AM in good condition and properly preserved. The temperatures of the 5 coolers at receipt time were 0.0º C, 0.1º C, 0.2º C, 0.6º C and 1.3º C.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Method 0010/Method 3542 Sampling Train Preparation

Train fractions were extracted and prepared for analysis in TestAmerica's Knoxville laboratory. Extracts and condensate samples were forwarded to the Denver laboratory for HFPO-DA analysis. All results are reported in "Total ug" per sample.

LCMS

Method 8321A: The Surrogate/Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit:

Q-1826 M0010 QC RUN BT COND (140-11058-15)
LCS 280-409035/2-A
LCSD 280-409035/14-A

Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration and LCS/LCSD %R is in control.

Comments

Reporting Limits (RLs) and Method Detection Limits (MDLs) for the HFPO-DA used in this report were derived in Denver for reporting soils and water samples. Method 0010 sampling train matrix specific RLs and MDLs have not been established for HFPO-DA. The soil and water limits are expected to be reasonable approximations of the actual matrix specific limits, under these conditions.

The expanded deliverable section of the package is split into two sections: 8321A_HFPO_DU is specific to condensates, and Method DV-LC-0012 contains the XAD and Filter data. Both methods share the same calibration on 10/10/17. A single instance of this calibration and the associated detection limit check (DLCK) and Initial calibration verification (ICV) can be found in the 8321A_HFPO_DU section of the package as part of our automated package generation procedures.

LCMS

Analysis Batch: 404345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-404345/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 409031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-1 - DL	Q-1801,1802 M0010 RUN 1 FH	Total/NA	Air	None	
140-11058-1	Q-1801,1802 M0010 RUN 1 FH	Total/NA	Air	None	
140-11058-5 - DL	Q-1808,1809 M0010 RUN 2 FH	Total/NA	Air	None	
140-11058-5	Q-1808,1809 M0010 RUN 2 FH	Total/NA	Air	None	
140-11058-9	Q-1815,1816 M0010 RUN 3 FH	Total/NA	Air	None	
140-11058-9 - DL	Q-1815,1816 M0010 RUN 3 FH	Total/NA	Air	None	
140-11058-13	Q-1822,1823 M0010 QC RUN BT FH	Total/NA	Air	None	
MB 280-409031/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409031/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-2	Q-1803,1804,1806 M0010 RUN 1 BH	Total/NA	Air	None	
140-11058-4	Q-1807 M0010 RUN 1 XAD-2	Total/NA	Air	None	
140-11058-6	Q-1810,1811,1813 M0010 RUN 2 BH	Total/NA	Air	None	
140-11058-8	Q-1814 M0010 RUN 2 XAD-2	Total/NA	Air	None	
140-11058-10	Q-1817,1818,1820 M0010 RUN 3 BH	Total/NA	Air	None	
140-11058-12	Q-1821 M0010 RUN 3 XAD-2	Total/NA	Air	None	
140-11058-14	Q-1824,1825,1827 M0010 QC RUN BT BH	Total/NA	Air	None	
140-11058-16	Q-1828 M0010 QC RUN BT XAD-2	Total/NA	Air	None	
140-11058-18	Q-1830 M0010 QC MEOH WITH 5%/NH4OH RB	Total/NA	Air	None	
140-11058-19	Q-1831 M0010 QC XAD-2 RB	Total/NA	Air	None	
140-11058-20	Q-1832 M0010 QC MEOH WITH 5%/NH4OH TB	Total/NA	Air	None	
140-11058-21	Q-1833 M0010 QC XAD-2 TB	Total/NA	Air	None	
140-11058-22	Q-1836 M0010 QC IMP MEOH/5% NH4OH RINS	Total/NA	Air	None	
MB 280-409032/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409032/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409035

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-3	Q-1805 M0010 RUN 1 COND	Total/NA	Air	None	
140-11058-7	Q-1812 M0010 RUN 2 COND	Total/NA	Air	None	
140-11058-11	Q-1819 M0010 RUN 3 COND	Total/NA	Air	None	
140-11058-15	Q-1826 M0010 QC RUN BT COND	Total/NA	Air	None	
140-11058-17	Q-1829 M0010 QC DI WATER RB	Total/NA	Air	None	
MB 280-409035/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409035/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-409035/14-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-409035/15-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-2 - REDL	Q-1803,1804,1806 M0010 RUN 1 BH	Total/NA	Air	None	
140-11058-6 - REDL	Q-1810,1811,1813 M0010 RUN 2 BH	Total/NA	Air	None	
140-11058-10 - REDL	Q-1817,1818,1820 M0010 RUN 3 BH	Total/NA	Air	None	

LCMS (Continued)

Analysis Batch: 409698

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-1	Q-1801,1802 M0010 RUN 1 FH	Total/NA	Air	8321A	409031
140-11058-5	Q-1808,1809 M0010 RUN 2 FH	Total/NA	Air	8321A	409031
140-11058-9	Q-1815,1816 M0010 RUN 3 FH	Total/NA	Air	8321A	409031
140-11058-13	Q-1822,1823 M0010 QC RUN BT FH	Total/NA	Air	8321A	409031
MB 280-409031/1-A	Method Blank	Total/NA	Air	8321A	409031
LCS 280-409031/2-A	Lab Control Sample	Total/NA	Air	8321A	409031

Analysis Batch: 409699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-4	Q-1807 M0010 RUN 1 XAD-2	Total/NA	Air	8321A	409032
140-11058-8	Q-1814 M0010 RUN 2 XAD-2	Total/NA	Air	8321A	409032
140-11058-12	Q-1821 M0010 RUN 3 XAD-2	Total/NA	Air	8321A	409032
140-11058-14	Q-1824,1825,1827 M0010 QC RUN BT BH	Total/NA	Air	8321A	409032
140-11058-16	Q-1828 M0010 QC RUN BT XAD-2	Total/NA	Air	8321A	409032
140-11058-18	Q-1830 M0010 QC MEOH WITH 5%/NH4OH RB	Total/NA	Air	8321A	409032
140-11058-19	Q-1831 M0010 QC XAD-2 RB	Total/NA	Air	8321A	409032
140-11058-20	Q-1832 M0010 QC MEOH WITH 5%/NH4OH TB	Total/NA	Air	8321A	409032
140-11058-21	Q-1833 M0010 QC XAD-2 TB	Total/NA	Air	8321A	409032
140-11058-22	Q-1836 M0010 QC IMP MEOH/5% NH4OH RINS	Total/NA	Air	8321A	409032
MB 280-409032/1-A	Method Blank	Total/NA	Air	8321A	409032
LCS 280-409032/2-A	Lab Control Sample	Total/NA	Air	8321A	409032

Analysis Batch: 409700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-2 - REDL	Q-1803,1804,1806 M0010 RUN 1 BH	Total/NA	Air	8321A	409464
140-11058-6 - REDL	Q-1810,1811,1813 M0010 RUN 2 BH	Total/NA	Air	8321A	409464
140-11058-10 - REDL	Q-1817,1818,1820 M0010 RUN 3 BH	Total/NA	Air	8321A	409464

Analysis Batch: 409720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-1 - DL	Q-1801,1802 M0010 RUN 1 FH	Total/NA	Air	8321A	409031
140-11058-5 - DL	Q-1808,1809 M0010 RUN 2 FH	Total/NA	Air	8321A	409031
140-11058-9 - DL	Q-1815,1816 M0010 RUN 3 FH	Total/NA	Air	8321A	409031

Analysis Batch: 409722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-2	Q-1803,1804,1806 M0010 RUN 1 BH	Total/NA	Air	8321A	409032
140-11058-6	Q-1810,1811,1813 M0010 RUN 2 BH	Total/NA	Air	8321A	409032
140-11058-10	Q-1817,1818,1820 M0010 RUN 3 BH	Total/NA	Air	8321A	409032

Analysis Batch: 410188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11058-3	Q-1805 M0010 RUN 1 COND	Total/NA	Air	8321A	409035
140-11058-7	Q-1812 M0010 RUN 2 COND	Total/NA	Air	8321A	409035
140-11058-11	Q-1819 M0010 RUN 3 COND	Total/NA	Air	8321A	409035
140-11058-15	Q-1826 M0010 QC RUN BT COND	Total/NA	Air	8321A	409035
140-11058-17	Q-1829 M0010 QC DI WATER RB	Total/NA	Air	8321A	409035
MB 280-409035/1-A	Method Blank	Total/NA	Air	8321A	409035
LCS 280-409035/2-A	Lab Control Sample	Total/NA	Air	8321A	409035
LCSD 280-409035/14-A	Lab Control Sample Dup	Total/NA	Air	8321A	409035
LLCS 280-409035/15-A	Lab Control Sample	Total/NA	Air	8321A	409035

Client Sample ID: Q-1801,1802 M0010 RUN 1 FH

Lab Sample ID: 140-11058-1
Matrix: Air
Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	25.5	E	0.125	0.125	ug/Sample		03/26/18 09:21	03/30/18 11:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:34*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	25.5		0.250	0.250	ug/Sample		03/26/18 09:21	03/30/18 14:23	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*	*D*	*50 - 200*	*03/26/18 09:21*	*03/30/18 14:23*	*2*

Client Sample ID: Q-1803,1804,1806 M0010 RUN 1 BH

Lab Sample ID: 140-11058-2
Matrix: Air
Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	16.2		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*69*		*50 - 200*	*03/26/18 09:24*	*03/30/18 14:36*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	14.3		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*03/29/18 07:08*	*03/30/18 13:57*	*1*

Client Sample ID: Q-1805 M0010 RUN 1 COND

Lab Sample ID: 140-11058-3
Matrix: Air
Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0276	J	0.0500	0.00255	ug/Sample		03/26/18 19:00	04/04/18 08:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*54*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:21*	*1*

Client Sample ID: Q-1807 M0010 RUN 1 XAD-2

Lab Sample ID: 140-11058-4
Matrix: Air
Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	69		50 - 200	03/26/18 09:24	03/30/18 12:20	1

Client Sample ID: Q-1808,1809 M0010 RUN 2 FH
Lab Sample ID: 140-11058-5

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	46.6	E	0.150	0.150	ug/Sample		03/26/18 09:21	03/30/18 11:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	75		50 - 200	03/26/18 09:21	03/30/18 11:37	1

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	46.2		0.300	0.300	ug/Sample		03/26/18 09:21	03/30/18 14:27	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	83	D	50 - 200	03/26/18 09:21	03/30/18 14:27	2

Client Sample ID: Q-1810,1811,1813 M0010 RUN 2 BH
Lab Sample ID: 140-11058-6

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	6.68		0.225	0.225	ug/Sample		03/26/18 09:24	03/30/18 14:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	74		50 - 200	03/26/18 09:24	03/30/18 14:40	1

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		11.4	11.4	ug/Sample		03/29/18 07:08	03/30/18 14:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	85		50 - 200	03/29/18 07:08	03/30/18 14:00	1

Client Sample ID: Q-1812 M0010 RUN 2 COND
Lab Sample ID: 140-11058-7

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00853	J	0.0500	0.00255	ug/Sample		03/26/18 19:00	04/04/18 08:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	64		50 - 200	03/26/18 19:00	04/04/18 08:25	1

Client Sample ID: Q-1814 M0010 RUN 2 XAD-2

Lab Sample ID: 140-11058-8

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*68*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:26*	*1*

Client Sample ID: Q-1815,1816 M0010 RUN 3 FH

Lab Sample ID: 140-11058-9

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**156**	**E**	0.125	0.125	ug/Sample		03/26/18 09:21	03/30/18 11:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*55*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:40*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**153**		1.25	1.25	ug/Sample		03/26/18 09:21	03/30/18 14:30	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*	*D*	*50 - 200*	*03/26/18 09:21*	*03/30/18 14:30*	*10*

Client Sample ID: Q-1817,1818,1820 M0010 RUN 3 BH

Lab Sample ID: 140-11058-10

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**8.20**		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*72*		*50 - 200*	*03/26/18 09:24*	*03/30/18 14:43*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 14:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*50 - 200*	*03/29/18 07:08*	*03/30/18 14:04*	*1*

Client Sample ID: Q-1819 M0010 RUN 3 COND

Lab Sample ID: 140-11058-11

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0497	0.00254	ug/Sample		03/26/18 19:00	04/04/18 08:28	1

Client Sample ID: Q-1819 M0010 RUN 3 COND
Lab Sample ID: 140-11058-11

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*56*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:28*	*1*

Client Sample ID: Q-1821 M0010 RUN 3 XAD-2
Lab Sample ID: 140-11058-12

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*72*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:33*	*1*

Client Sample ID: Q-1822,1823 M0010 QC RUN BT FH
Lab Sample ID: 140-11058-13

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.629**		0.0250	0.0250	ug/Sample		03/26/18 09:21	03/30/18 11:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:44*	*1*

Client Sample ID: Q-1824,1825,1827 M0010 QC RUN BT BH
Lab Sample ID: 140-11058-14

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.509**		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*69*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:36*	*1*

Client Sample ID: Q-1826 M0010 QC RUN BT COND
Lab Sample ID: 140-11058-15

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.00121**	**J**	0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*27*	*X*	*50 - 200*	*03/26/18 19:00*	*04/04/18 08:31*	*1*

Client Sample ID: Q-1828 M0010 QC RUN BT XAD-2
Lab Sample ID: 140-11058-16

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*75*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:39*	*1*

Client Sample ID: Q-1829 M0010 QC DI WATER RB
Lab Sample ID: 140-11058-17

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.000412**	**J**	0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*67*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:34*	*1*

Client Sample ID: Q-1830 M0010 QC MEOH WITH 5%/NH4OH RB
Lab Sample ID: 140-11058-18

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 12:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*81*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:46*	*1*

Client Sample ID: Q-1831 M0010 QC XAD-2 RB
Lab Sample ID: 140-11058-19

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*75*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:49*	*1*

Client Sample ID: Q-1832 M0010 QC MEOH WITH 5%/NH4OH TB

Lab Sample ID: 140-11058-20

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 12:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*87*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:52*	*1*

Client Sample ID: Q-1833 M0010 QC XAD-2 TB

Lab Sample ID: 140-11058-21

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*75*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:55*	*1*

Client Sample ID: Q-1836 M0010 QC IMP MEOH/5% NH4OH RINSE PB

Lab Sample ID: 140-11058-22

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.0367**		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 12:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:59*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Semi Works Stack - M0010

TestAmerica Job ID: 140-11058-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.00250	0.00128	ug/Sample	8321A

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.0250	0.0250	ug/Sample	8321A
HFPO-DA	0.100	0.100	ug/Sample	8321A

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Semi Works Stack - M0010

TestAmerica Job ID: 140-11058-1

Method: 8321A - HFPO-DA

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11058-3	Q-1805 M0010 RUN 1 COND	54
140-11058-7	Q-1812 M0010 RUN 2 COND	64
140-11058-11	Q-1819 M0010 RUN 3 COND	56
140-11058-15	Q-1826 M0010 QC RUN BT CO	27 X
140-11058-17	Q-1829 M0010 QC DI WATER F	67
LCS 280-409035/2-A	Lab Control Sample	48 X
LCSD 280-409035/14-A	Lab Control Sample Dup	46 X
LLCS 280-409035/15-A	Lab Control Sample	52
MB 280-409035/1-A	Method Blank	55

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - PFOA and PFOS

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11058-1	Q-1801,1802 M0010 RUN 1 FH	84
140-11058-1 - DL	Q-1801,1802 M0010 RUN 1 FH	89 D
140-11058-2 - REDL	Q-1803,1804,1806 M0010 RUN	84
140-11058-2	Q-1803,1804,1806 M0010 RUN	69
140-11058-4	Q-1807 M0010 RUN 1 XAD-2	69
140-11058-5	Q-1808,1809 M0010 RUN 2 FH	75
140-11058-5 - DL	Q-1808,1809 M0010 RUN 2 FH	83 D
140-11058-6 - REDL	Q-1810,1811,1813 M0010 RUN	85
140-11058-6	Q-1810,1811,1813 M0010 RUN	74
140-11058-8	Q-1814 M0010 RUN 2 XAD-2	68
140-11058-9	Q-1815,1816 M0010 RUN 3 FH	55
140-11058-9 - DL	Q-1815,1816 M0010 RUN 3 FH	84 D
140-11058-10 - REDL	Q-1817,1818,1820 M0010 RUN	83
140-11058-10	Q-1817,1818,1820 M0010 RUN	72
140-11058-12	Q-1821 M0010 RUN 3 XAD-2	72
140-11058-13	Q-1822,1823 M0010 QC RUN B	76
140-11058-14	Q-1824,1825,1827 M0010 QC R	69
140-11058-16	Q-1828 M0010 QC RUN BT XAI	75
140-11058-18	Q-1830 M0010 QC MEOH WITH	81
140-11058-19	Q-1831 M0010 QC XAD-2 RB	75
140-11058-20	Q-1832 M0010 QC MEOH WITH	87
140-11058-21	Q-1833 M0010 QC XAD-2 TB	75
140-11058-22	Q-1836 M0010 QC IMP MEOH/S	83
DLCK 280-404345/13	Lab Control Sample	104
LCS 280-409031/2-A	Lab Control Sample	82
LCS 280-409032/2-A	Lab Control Sample	72
MB 280-409031/1-A	Method Blank	79
MB 280-409032/1-A	Method Blank	63

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-409035/1-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409035

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*55*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:08*	*1*

Lab Sample ID: LCS 280-409035/2-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.05605		ug/Sample		112	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*48*	*X*	*50 - 200*

Lab Sample ID: LCSD 280-409035/14-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.05452		ug/Sample		109	50 - 150	3	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*46*	*X*	*50 - 200*

Lab Sample ID: LLCS 280-409035/15-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.005137		ug/Sample		103	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*52*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-404345/13
Matrix: Air
Analysis Batch: 404345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.250	0.2255		ug/L		90	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*104*		*50 - 200*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-409031/1-A
Matrix: Air
Analysis Batch: 409698

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409031

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:21	03/30/18 11:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*79*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:27*	*1*

Lab Sample ID: LCS 280-409031/2-A
Matrix: Air
Analysis Batch: 409698

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409031

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.500	0.5103		ug/Sample		102	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*82*		*50 - 200*

Lab Sample ID: MB 280-409032/1-A
Matrix: Air
Analysis Batch: 409699

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*63*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:10*	*1*

Lab Sample ID: LCS 280-409032/2-A
Matrix: Air
Analysis Batch: 409699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409032

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	4.00	3.580		ug/Sample		89	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*72*		*50 - 200*

Client Sample ID: Q-1801,1802 M0010 RUN 1 FH

Lab Sample ID: 140-11058-1

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A	DL	2			409720	03/30/18 14:23	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1803,1804,1806 M0010 RUN 1 BH

Lab Sample ID: 140-11058-2

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 13:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1805 M0010 RUN 1 COND

Lab Sample ID: 140-11058-3

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:21	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1807 M0010 RUN 1 XAD-2

Lab Sample ID: 140-11058-4

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1808,1809 M0010 RUN 2 FH

Lab Sample ID: 140-11058-5

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	300 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:37	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	300 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A	DL	2			409720	03/30/18 14:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1810,1811,1813 M0010 RUN 2 BH

Lab Sample ID: 140-11058-6

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0022 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:00	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	450 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1812 M0010 RUN 2 COND

Lab Sample ID: 140-11058-7

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:25	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1814 M0010 RUN 2 XAD-2

Lab Sample ID: 140-11058-8

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:26	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1815,1816 M0010 RUN 3 FH

Lab Sample ID: 140-11058-9

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN

Client Sample ID: Q-1815,1816 M0010 RUN 3 FH

Lab Sample ID: 140-11058-9

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			409698	03/30/18 11:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A	DL	10			409720	03/30/18 14:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1817,1818,1820 M0010 RUN 3 BH

Lab Sample ID: 140-11058-10

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:43	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1819 M0010 RUN 3 COND

Lab Sample ID: 140-11058-11

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05026 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:28	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1821 M0010 RUN 3 XAD-2

Lab Sample ID: 140-11058-12

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1822,1823 M0010 QC RUN BT FH

Lab Sample ID: 140-11058-13

Date Collected: 03/23/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN

Client Sample ID: Q-1822,1823 M0010 QC RUN BT FH — Lab Sample ID: 140-11058-13

Date Collected: 03/23/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			409698	03/30/18 11:44	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1824,1825,1827 M0010 QC RUN BT BH — Lab Sample ID: 140-11058-14

Date Collected: 03/23/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1826 M0010 QC RUN BT COND — Lab Sample ID: 140-11058-15

Date Collected: 03/23/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1828 M0010 QC RUN BT XAD-2 — Lab Sample ID: 140-11058-16

Date Collected: 03/23/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:39	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1829 M0010 QC DI WATER RB — Lab Sample ID: 140-11058-17

Date Collected: 03/23/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1830 M0010 QC MEOH WITH 5%/NH4OH RB

Lab Sample ID: 140-11058-18

Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:46	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1831 M0010 QC XAD-2 RB

Lab Sample ID: 140-11058-19

Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:49	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1832 M0010 QC MEOH WITH 5%/NH4OH TB

Lab Sample ID: 140-11058-20

Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:52	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1833 M0010 QC XAD-2 TB

Lab Sample ID: 140-11058-21

Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:55	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1836 M0010 QC IMP MEOH/5% NH4OH RINSE PB

Lab Sample ID: 140-11058-22

Date Collected: 03/23/18 00:00
Date Received: 03/24/18 11:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:59	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-409031/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-409032/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:10	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-409035/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-404345/13

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			404345	02/08/18 13:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409031/2-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409032/2-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409035/2-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-409035/14-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:15	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LLCS 280-409035/15-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:18	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Laboratory References:
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Semi Works Stack - M0010

TestAmerica Job ID: 140-11058-1

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-18
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-19
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-18
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-18
Kentucky (DW)	State Program	4	90101	12-31-18
Louisiana	NELAP	6	83979	06-30-18
Louisiana (DW)	NELAP	6	LA160005	12-31-18
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-18
New Jersey	NELAP	2	TN001	06-30-18
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-18
North Carolina (WW/SW)	State Program	4	64	12-31-18
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-18
Oregon	NELAP	10	TNI0189	01-01-19
Pennsylvania	NELAP	3	68-00576	12-31-18
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-18
US Fish & Wildlife	Federal		LE-058448-0	07-31-18
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-18
Virginia	NELAP	3	460176	09-14-18
Washington	State Program	10	C593	01-19-19
West Virginia (DW)	State Program	3	9955C	12-31-18
West Virginia DEP	State Program	3	345	04-30-18
Wisconsin	State Program	5	998044300	08-31-18

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18 *
Illinois	NELAP	5	200017	04-30-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Denver (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11058-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 404345

Lab Sample ID: STD001 280-404345/3 IC Client Sample ID:

Date Analyzed: 02/08/18 13:05 Lab File ID: hfpo718B08034.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Assign Peak	meyera	02/08/18 15:19

Lab Sample ID: STD002 280-404345/4 IC Client Sample ID:

Date Analyzed: 02/08/18 13:08 Lab File ID: hfpo718B08035.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:19

Lab Sample ID: DLCK 280-404345/13 Client Sample ID:

Date Analyzed: 02/08/18 13:38 Lab File ID: hfpo718B08044.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11058-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 410188

Lab Sample ID: LLCS 280-409035/15-A Client Sample ID:

Date Analyzed: 04/04/18 08:18 Lab File ID: hfpo718D04007.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.98	Baseline	meyera	04/04/18 12:22

Lab Sample ID: 140-11058-7 Client Sample ID: Q-1812 M0010 RUN 2 COND

Date Analyzed: 04/04/18 08:25 Lab File ID: hfpo718D04009.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.96	Assign Peak	meyera	04/04/18 12:22

Lab Sample ID: 140-11058-15 Client Sample ID: Q-1826 M0010 QC RUN BT COND

Date Analyzed: 04/04/18 08:31 Lab File ID: hfpo718D04011.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.96	Assign Peak	meyera	04/04/18 12:23

ANALYTICAL REPORT

Job Number: 140-11059-1

Job Description: Fayetteville Polymer Stack - M0010

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager I
4/11/2018 2:17 PM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
04/11/2018

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Qualifiers

LCMS

Qualifier	Qualifier Description
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Method	Method Description	Protocol	Laboratory
8321A	PFOA and PFOS	SW846	TAL DEN
8321A	HFPO-DA	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-11059-1	D-2601,2602 M0010 RUN 1 FH	Air	03/21/18 00:00	03/24/18 11:40
140-11059-2	D-2603,2604,2606 M0010 RUN 1 BH	Air	03/21/18 00:00	03/24/18 11:40
140-11059-3	D-2605 M0010 RUN 1 COND	Air	03/21/18 00:00	03/24/18 11:40
140-11059-4	D-2607 M0010 RUN 1 XAD-2	Air	03/21/18 00:00	03/24/18 11:40
140-11059-5	D-2608,2609 M0010 RUN 2 FH	Air	03/21/18 00:00	03/24/18 11:40
140-11059-6	D-2610,2611,2613 M0010 RUN 2 BH	Air	03/21/18 00:00	03/24/18 11:40
140-11059-7	D-2612 M0010 RUN 2 COND	Air	03/21/18 00:00	03/24/18 11:40
140-11059-8	D-2614 M0010 RUN 2 XAD-2	Air	03/21/18 00:00	03/24/18 11:40
140-11059-9	D-2615,2616 M0010 RUN 3 FH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-10	D-2617,2618,2620 M0010 RUN 3 BH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-11	D-2619 M0010 RUN 3 COND	Air	03/22/18 00:00	03/24/18 11:40
140-11059-12	D-2621 M0010 RUN 3 XAD-2	Air	03/22/18 00:00	03/24/18 11:40
140-11059-13	D-2637,2638 M0010 RUN 4 FH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-14	D-2639,2640,2642 M0010 RUN 4 BH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-15	D-2641 M0010 RUN 4 COND	Air	03/22/18 00:00	03/24/18 11:40
140-11059-16	D-2643 M0010 RUN 4 XAD-2	Air	03/22/18 00:00	03/24/18 11:40
140-11059-17	D-2622,2623 M0010 QC RUN BT FH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-18	D-2624,2625,2627 M0010 QC RUN BT BH	Air	03/22/18 00:00	03/24/18 11:40
140-11059-19	D-2626 M0010 QC RUN BT COND	Air	03/22/18 00:00	03/24/18 11:40
140-11059-20	D-2628 M0010 QC RUN BT XAD-2	Air	03/22/18 00:00	03/24/18 11:40
140-11059-21	D-2629 M0010 QC DI WATER RB	Air	03/21/18 00:00	03/24/18 11:40
140-11059-22	D-2630 M0010 QC MEOH WITH 5%/NH4OH RB	Air	03/21/18 00:00	03/24/18 11:40
140-11059-23	D-2631 M0010 QC XAD-2 RB	Air	03/22/18 00:00	03/24/18 11:40
140-11059-24	D-2632 M0010 QC MEOH WITH 5%/NH4OH TB	Air	03/21/18 00:00	03/24/18 11:40
140-11059-25	D-2633 M0010 QC XAD-2 TB	Air	03/22/18 00:00	03/24/18 11:40
140-11059-26	D-2636 M0010 QC IMP MEOH/ 5% NH4OH PB	Air	03/21/18 00:00	03/24/18 11:40

Job Narrative
140-11059-1

Sample Receipt

The samples were received on March 24, 2018 at 11:40 AM in good condition and properly preserved. The temperatures of the 5 coolers at receipt time were 0.0º C, 0.1º C, 0.2º C, 0.6º C and 1.3º C.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Method 0010/Method 3542 Sampling Train Preparation

Train fractions were extracted and prepared for analysis in TestAmerica's Knoxville laboratory. Extracts and condensate samples were forwarded to the Denver laboratory for HFPO-DA analysis. All results are reported in "Total ug" per sample.

LCMS

Method 8321A: The Surrogate/Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit:

D-2605 M0010 RUN 1 COND (140-11059-3)
D-2612 M0010 RUN 2 COND (140-11059-7)
D-2626 M0010 QC RUN BT COND (140-11059-19)
LCS 280-409035/2-A
LCSD 280-409035/14-A
D-2617,2618,2620 M0010 RUN 3 BH (140-11059-10)
D-2639,2640,2642 M0010 RUN 4 BH (140-11059-14)

Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. All detection limits are below the lower calibration and LCS/LCSD %R is in control.

Comments

Reporting Limits (RLs) and Method Detection Limits (MDLs) for the HFPO-DA used in this report were derived in Denver for reporting soils and water samples. Method 0010 sampling train matrix specific RLs and MDLs have not been established for HFPO-DA. The soil and water limits are expected to be reasonable approximations of the actual matrix specific limits, under these conditions.

The expanded deliverable section of the package is split into two sections: 8321A_HFPO_DU is specific to condensates, and Method DV-LC-0012 contains the XAD and Filter data. Both methods share the same calibration on 10/10/17. A single instance of this calibration and the associated detection limit check (DLCK) and Initial calibration verification (ICV) can be found in the 8321A_HFPO_DU section of the package as part of our automated package generation procedures.

LCMS

Analysis Batch: 404345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-404345/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 409031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-1	D-2601,2602 M0010 RUN 1 FH	Total/NA	Air	None	
140-11059-5	D-2608,2609 M0010 RUN 2 FH	Total/NA	Air	None	
140-11059-9	D-2615,2616 M0010 RUN 3 FH	Total/NA	Air	None	
140-11059-13	D-2637,2638 M0010 RUN 4 FH	Total/NA	Air	None	
140-11059-17	D-2622,2623 M0010 QC RUN BT FH	Total/NA	Air	None	
MB 280-409031/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409031/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-2	D-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	None	
140-11059-4	D-2607 M0010 RUN 1 XAD-2	Total/NA	Air	None	
140-11059-6	D-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	
140-11059-8	D-2614 M0010 RUN 2 XAD-2	Total/NA	Air	None	
140-11059-10	D-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	None	
140-11059-12	D-2621 M0010 RUN 3 XAD-2	Total/NA	Air	None	
140-11059-14	D-2639,2640,2642 M0010 RUN 4 BH	Total/NA	Air	None	
140-11059-16	D-2643 M0010 RUN 4 XAD-2	Total/NA	Air	None	
140-11059-18	D-2624,2625,2627 M0010 QC RUN BT BH	Total/NA	Air	None	
140-11059-20	D-2628 M0010 QC RUN BT XAD-2	Total/NA	Air	None	
140-11059-22	D-2630 M0010 QC MEOH WITH 5%/NH4OH RB	Total/NA	Air	None	
140-11059-23	D-2631 M0010 QC XAD-2 RB	Total/NA	Air	None	
140-11059-24	D-2632 M0010 QC MEOH WITH 5%/NH4OH TB	Total/NA	Air	None	
140-11059-25	D-2633 M0010 QC XAD-2 TB	Total/NA	Air	None	
140-11059-26	D-2636 M0010 QC IMP MEOH/ 5% NH4OH PB	Total/NA	Air	None	
MB 280-409032/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409032/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409035

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-3	D-2605 M0010 RUN 1 COND	Total/NA	Air	None	
140-11059-7	D-2612 M0010 RUN 2 COND	Total/NA	Air	None	
140-11059-11	D-2619 M0010 RUN 3 COND	Total/NA	Air	None	
140-11059-15	D-2641 M0010 RUN 4 COND	Total/NA	Air	None	
140-11059-19	D-2626 M0010 QC RUN BT COND	Total/NA	Air	None	
140-11059-21	D-2629 M0010 QC DI WATER RB	Total/NA	Air	None	
MB 280-409035/1-A	Method Blank	Total/NA	Air	None	
LCS 280-409035/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-409035/14-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-409035/15-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 409464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-2 - REDL	D-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	None	
140-11059-6 - REDL	D-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	
140-11059-10 - REDL	D-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	None	
140-11059-14 - REDL	D-2639,2640,2642 M0010 RUN 4 BH	Total/NA	Air	None	

QC Association Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Analysis Batch: 409698

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-1	D-2601,2602 M0010 RUN 1 FH	Total/NA	Air	8321A	409031
140-11059-5	D-2608,2609 M0010 RUN 2 FH	Total/NA	Air	8321A	409031
140-11059-9	D-2615,2616 M0010 RUN 3 FH	Total/NA	Air	8321A	409031
140-11059-13	D-2637,2638 M0010 RUN 4 FH	Total/NA	Air	8321A	409031
140-11059-17	D-2622,2623 M0010 QC RUN BT FH	Total/NA	Air	8321A	409031
MB 280-409031/1-A	Method Blank	Total/NA	Air	8321A	409031
LCS 280-409031/2-A	Lab Control Sample	Total/NA	Air	8321A	409031

Analysis Batch: 409699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-4	D-2607 M0010 RUN 1 XAD-2	Total/NA	Air	8321A	409032
140-11059-8	D-2614 M0010 RUN 2 XAD-2	Total/NA	Air	8321A	409032
140-11059-12	D-2621 M0010 RUN 3 XAD-2	Total/NA	Air	8321A	409032
140-11059-16	D-2643 M0010 RUN 4 XAD-2	Total/NA	Air	8321A	409032
140-11059-18	D-2624,2625,2627 M0010 QC RUN BT BH	Total/NA	Air	8321A	409032
140-11059-20	D-2628 M0010 QC RUN BT XAD-2	Total/NA	Air	8321A	409032
140-11059-22	D-2630 M0010 QC MEOH WITH 5%/NH4OH RB	Total/NA	Air	8321A	409032
140-11059-23	D-2631 M0010 QC XAD-2 RB	Total/NA	Air	8321A	409032
140-11059-24	D-2632 M0010 QC MEOH WITH 5%/NH4OH TB	Total/NA	Air	8321A	409032
140-11059-25	D-2633 M0010 QC XAD-2 TB	Total/NA	Air	8321A	409032
140-11059-26	D-2636 M0010 QC IMP MEOH/ 5% NH4OH PB	Total/NA	Air	8321A	409032
MB 280-409032/1-A	Method Blank	Total/NA	Air	8321A	409032
LCS 280-409032/2-A	Lab Control Sample	Total/NA	Air	8321A	409032

Analysis Batch: 409700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-2 - REDL	D-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	8321A	409464
140-11059-6 - REDL	D-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	409464
140-11059-10 - REDL	D-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	8321A	409464
140-11059-14 - REDL	D-2639,2640,2642 M0010 RUN 4 BH	Total/NA	Air	8321A	409464

Analysis Batch: 409722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-2	D-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	8321A	409032
140-11059-6	D-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	409032
140-11059-10	D-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	8321A	409032
140-11059-14	D-2639,2640,2642 M0010 RUN 4 BH	Total/NA	Air	8321A	409032

Analysis Batch: 410188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-11059-3	D-2605 M0010 RUN 1 COND	Total/NA	Air	8321A	409035
140-11059-7	D-2612 M0010 RUN 2 COND	Total/NA	Air	8321A	409035
140-11059-11	D-2619 M0010 RUN 3 COND	Total/NA	Air	8321A	409035
140-11059-15	D-2641 M0010 RUN 4 COND	Total/NA	Air	8321A	409035
140-11059-19	D-2626 M0010 QC RUN BT COND	Total/NA	Air	8321A	409035
140-11059-21	D-2629 M0010 QC DI WATER RB	Total/NA	Air	8321A	409035
MB 280-409035/1-A	Method Blank	Total/NA	Air	8321A	409035
LCS 280-409035/2-A	Lab Control Sample	Total/NA	Air	8321A	409035
LCSD 280-409035/14-A	Lab Control Sample Dup	Total/NA	Air	8321A	409035
LLCS 280-409035/15-A	Lab Control Sample	Total/NA	Air	8321A	409035

Client Sample ID: D-2601,2602 M0010 RUN 1 FH

Lab Sample ID: 140-11059-1

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	15.3		0.125	0.125	ug/Sample		03/26/18 09:21	03/30/18 11:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*80*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:50*	*1*

Client Sample ID: D-2603,2604,2606 M0010 RUN 1 BH

Lab Sample ID: 140-11059-2

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	9.18		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*61*		*50 - 200*	*03/26/18 09:24*	*03/30/18 14:46*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 14:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*		*50 - 200*	*03/29/18 07:08*	*03/30/18 14:07*	*1*

Client Sample ID: D-2605 M0010 RUN 1 COND

Lab Sample ID: 140-11059-3

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0931		0.0497	0.00254	ug/Sample		03/26/18 19:00	04/04/18 08:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*42*	*X*	*50 - 200*	*03/26/18 19:00*	*04/04/18 08:41*	*1*

Client Sample ID: D-2607 M0010 RUN 1 XAD-2

Lab Sample ID: 140-11059-4

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*77*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:05*	*1*

Client Sample ID: D-2608,2609 M0010 RUN 2 FH

Lab Sample ID: 140-11059-5

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.90		0.125	0.125	ug/Sample		03/26/18 09:21	03/30/18 11:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:53*	*1*

Client Sample ID: D-2610,2611,2613 M0010 RUN 2 BH

Lab Sample ID: 140-11059-6

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	5.38		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*55*		*50 - 200*	*03/26/18 09:24*	*03/30/18 14:50*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 14:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*03/29/18 07:08*	*03/30/18 14:10*	*1*

Client Sample ID: D-2612 M0010 RUN 2 COND

Lab Sample ID: 140-11059-7

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.332		0.0500	0.00255	ug/Sample		03/26/18 19:00	04/04/18 08:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*49*	*X*	*50 - 200*	*03/26/18 19:00*	*04/04/18 08:44*	*1*

Client Sample ID: D-2614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-11059-8

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:12*	*1*

Client Sample ID: D-2615,2616 M0010 RUN 3 FH

Lab Sample ID: 140-11059-9

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	10.5		0.100	0.100	ug/Sample		03/26/18 09:21	03/30/18 11:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:57*	*1*

Client Sample ID: D-2617,2618,2620 M0010 RUN 3 BH

Lab Sample ID: 140-11059-10

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	7.63		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*39*	*X*	*50 - 200*	*03/26/18 09:24*	*03/30/18 14:53*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*03/29/18 07:08*	*03/30/18 14:13*	*1*

Client Sample ID: D-2619 M0010 RUN 3 COND

Lab Sample ID: 140-11059-11

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00948	J	0.0500	0.00255	ug/Sample		03/26/18 19:00	04/04/18 08:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*57*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:47*	*1*

Client Sample ID: D-2621 M0010 RUN 3 XAD-2

Lab Sample ID: 140-11059-12

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*73*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:21*	*1*

Client Sample ID: D-2637,2638 M0010 RUN 4 FH

Lab Sample ID: 140-11059-13

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	8.91		0.150	0.150	ug/Sample		03/26/18 09:21	03/30/18 12:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*		*50 - 200*	*03/26/18 09:21*	*03/30/18 12:00*	*1*

Client Sample ID: D-2639,2640,2642 M0010 RUN 4 BH

Lab Sample ID: 140-11059-14

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	10.1		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*36*	*X*	*50 - 200*	*03/26/18 09:24*	*03/30/18 14:56*	*1*

Method: 8321A - PFOA and PFOS - REDL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		10.0	10.0	ug/Sample		03/29/18 07:08	03/30/18 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*88*		*50 - 200*	*03/29/18 07:08*	*03/30/18 14:17*	*1*

Client Sample ID: D-2641 M0010 RUN 4 COND

Lab Sample ID: 140-11059-15

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0497	0.00254	ug/Sample		03/26/18 19:00	04/04/18 08:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*62*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:51*	*1*

Client Sample ID: D-2643 M0010 RUN 4 XAD-2

Lab Sample ID: 140-11059-16

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*75*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:28*	*1*

Client Sample ID: D-2622,2623 M0010 QC RUN BT FH

Lab Sample ID: 140-11059-17

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.622		0.0250	0.0250	ug/Sample		03/26/18 09:21	03/30/18 12:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*77*		*50 - 200*	*03/26/18 09:21*	*03/30/18 12:03*	*1*

Client Sample ID: D-2624,2625,2627 M0010 QC RUN BT BH

Lab Sample ID: 140-11059-18

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*74*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:31*	*1*

Client Sample ID: D-2626 M0010 QC RUN BT COND

Lab Sample ID: 140-11059-19

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00458		0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*29*	*X*	*50 - 200*	*03/26/18 19:00*	*04/04/18 08:54*	*1*

Client Sample ID: D-2628 M0010 QC RUN BT XAD-2

Lab Sample ID: 140-11059-20

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:34*	*1*

Client Sample ID: D-2629 M0010 QC DI WATER RB

Lab Sample ID: 140-11059-21

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:57	1

Client Sample ID: D-2629 M0010 QC DI WATER RB

Lab Sample ID: 140-11059-21

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*70*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:57*	*1*

Client Sample ID: D-2630 M0010 QC MEOH WITH 5%/NH4OH RB

Lab Sample ID: 140-11059-22

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 13:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:38*	*1*

Client Sample ID: D-2631 M0010 QC XAD-2 RB

Lab Sample ID: 140-11059-23

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*71*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:41*	*1*

Client Sample ID: D-2632 M0010 QC MEOH WITH 5%/NH4OH TB

Lab Sample ID: 140-11059-24

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 13:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*88*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:44*	*1*

Client Sample ID: D-2633 M0010 QC XAD-2 TB

Lab Sample ID: 140-11059-25

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 13:47	1

Client Sample ID: D-2633 M0010 QC XAD-2 TB

Lab Sample ID: 140-11059-25

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: XAD Resin Tube - Large

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*73*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:47*	*1*

Client Sample ID: D-2636 M0010 QC IMP MEOH/ 5% NH4OH PB

Lab Sample ID: 140-11059-26

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0883		0.0250	0.0250	ug/Sample		03/26/18 09:24	03/30/18 13:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*03/26/18 09:24*	*03/30/18 13:51*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.00250	0.00128	ug/Sample	8321A

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.0250	0.0250	ug/Sample	8321A
HFPO-DA	0.100	0.100	ug/Sample	8321A

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Method: 8321A - HFPO-DA

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11059-3	D-2605 M0010 RUN 1 COND	42 X
140-11059-7	D-2612 M0010 RUN 2 COND	49 X
140-11059-11	D-2619 M0010 RUN 3 COND	57
140-11059-15	D-2641 M0010 RUN 4 COND	62
140-11059-19	D-2626 M0010 QC RUN BT CO	29 X
140-11059-21	D-2629 M0010 QC DI WATER F	70
LCS 280-409035/2-A	Lab Control Sample	48 X
LCSD 280-409035/14-A	Lab Control Sample Dup	46 X
LLCS 280-409035/15-A	Lab Control Sample	52
MB 280-409035/1-A	Method Blank	55

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - PFOA and PFOS

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-11059-1	D-2601,2602 M0010 RUN 1 FH	80
140-11059-2 - REDL	D-2603,2604,2606 M0010 RUN	89
140-11059-2	D-2603,2604,2606 M0010 RUN	61
140-11059-4	D-2607 M0010 RUN 1 XAD-2	77
140-11059-5	D-2608,2609 M0010 RUN 2 FH	84
140-11059-6 - REDL	D-2610,2611,2613 M0010 RUN	86
140-11059-6	D-2610,2611,2613 M0010 RUN	55
140-11059-8	D-2614 M0010 RUN 2 XAD-2	76
140-11059-9	D-2615,2616 M0010 RUN 3 FH	84
140-11059-10 - REDL	D-2617,2618,2620 M0010 RUN	86
140-11059-10	D-2617,2618,2620 M0010 RUN	39 X
140-11059-12	D-2621 M0010 RUN 3 XAD-2	73
140-11059-13	D-2637,2638 M0010 RUN 4 FH	85
140-11059-14 - REDL	D-2639,2640,2642 M0010 RUN	88
140-11059-14	D-2639,2640,2642 M0010 RUN	36 X
140-11059-16	D-2643 M0010 RUN 4 XAD-2	75
140-11059-17	D-2622,2623 M0010 QC RUN B	77
140-11059-18	D-2624,2625,2627 M0010 QC R	74
140-11059-20	D-2628 M0010 QC RUN BT XAI	76
140-11059-22	D-2630 M0010 QC MEOH WITH	86
140-11059-23	D-2631 M0010 QC XAD-2 RB	71
140-11059-24	D-2632 M0010 QC MEOH WITH	88
140-11059-25	D-2633 M0010 QC XAD-2 TB	73
140-11059-26	D-2636 M0010 QC IMP MEOH/	84
DLCK 280-404345/13	Lab Control Sample	104
LCS 280-409031/2-A	Lab Control Sample	82
LCS 280-409032/2-A	Lab Control Sample	72
MB 280-409031/1-A	Method Blank	79
MB 280-409032/1-A	Method Blank	63

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-409035/1-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409035

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		03/26/18 19:00	04/04/18 08:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*55*		*50 - 200*	*03/26/18 19:00*	*04/04/18 08:08*	*1*

Lab Sample ID: LCS 280-409035/2-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.05605		ug/Sample		112	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*48*	*X*	*50 - 200*

Lab Sample ID: LCSD 280-409035/14-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.05452		ug/Sample		109	50 - 150	3	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*46*	*X*	*50 - 200*

Lab Sample ID: LLCS 280-409035/15-A
Matrix: Air
Analysis Batch: 410188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409035

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.005137		ug/Sample		103	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*52*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-404345/13
Matrix: Air
Analysis Batch: 404345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.250	0.2255		ug/L		90	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*104*		*50 - 200*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-409031/1-A
Matrix: Air
Analysis Batch: 409698

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409031

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		03/26/18 09:21	03/30/18 11:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*79*		*50 - 200*	*03/26/18 09:21*	*03/30/18 11:27*	*1*

Lab Sample ID: LCS 280-409031/2-A
Matrix: Air
Analysis Batch: 409698

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409031

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.5103		ug/Sample		102	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*82*		*50 - 200*

Lab Sample ID: MB 280-409032/1-A
Matrix: Air
Analysis Batch: 409699

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		03/26/18 09:24	03/30/18 12:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*63*		*50 - 200*	*03/26/18 09:24*	*03/30/18 12:10*	*1*

Lab Sample ID: LCS 280-409032/2-A
Matrix: Air
Analysis Batch: 409699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409032

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.580		ug/Sample		89	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*72*		*50 - 200*

Client Sample ID: D-2601,2602 M0010 RUN 1 FH — Lab Sample ID: 140-11059-1

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:50	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2603,2604,2606 M0010 RUN 1 BH — Lab Sample ID: 140-11059-2

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:07	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:46	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2605 M0010 RUN 1 COND — Lab Sample ID: 140-11059-3

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05026 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:41	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2607 M0010 RUN 1 XAD-2 — Lab Sample ID: 140-11059-4

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:05	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2608,2609 M0010 RUN 2 FH — Lab Sample ID: 140-11059-5

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2610,2611,2613 M0010 RUN 2 BH — Lab Sample ID: 140-11059-6

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:10	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:50	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2612 M0010 RUN 2 COND — Lab Sample ID: 140-11059-7

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:44	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2614 M0010 RUN 2 XAD-2 — Lab Sample ID: 140-11059-8

Date Collected: 03/21/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2615,2616 M0010 RUN 3 FH — Lab Sample ID: 140-11059-9

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	200 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2617,2618,2620 M0010 RUN 3 BH — Lab Sample ID: 140-11059-10

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2617,2618,2620 M0010 RUN 3 BH — Lab Sample ID: 140-11059-10

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2619 M0010 RUN 3 COND — Lab Sample ID: 140-11059-11

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:47	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2621 M0010 RUN 3 XAD-2 — Lab Sample ID: 140-11059-12

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:21	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2637,2638 M0010 RUN 4 FH — Lab Sample ID: 140-11059-13

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	300 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 12:00	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2639,2640,2642 M0010 RUN 4 BH — Lab Sample ID: 140-11059-14

Date Collected: 03/22/18 00:00 — **Matrix: Air**
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None	REDL		0.0025 Sample	50 mL	409464	03/29/18 07:08		TAL DEN
Total/NA	Analysis	8321A	REDL	1			409700	03/30/18 14:17	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409722	03/30/18 14:56	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2641 M0010 RUN 4 COND

Lab Sample ID: 140-11059-15

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05026 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2643 M0010 RUN 4 XAD-2

Lab Sample ID: 140-11059-16

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:28	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2622,2623 M0010 QC RUN BT FH

Lab Sample ID: 140-11059-17

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 12:03	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2624,2625,2627 M0010 QC RUN BT BH

Lab Sample ID: 140-11059-18

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2626 M0010 QC RUN BT COND

Lab Sample ID: 140-11059-19

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:54	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2628 M0010 QC RUN BT XAD-2

Lab Sample ID: 140-11059-20

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2629 M0010 QC DI WATER RB

Lab Sample ID: 140-11059-21

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2630 M0010 QC MEOH WITH 5%/NH4OH RB

Lab Sample ID: 140-11059-22

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2631 M0010 QC XAD-2 RB

Lab Sample ID: 140-11059-23

Date Collected: 03/22/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:41	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2632 M0010 QC MEOH WITH 5%/NH4OH TB

Lab Sample ID: 140-11059-24

Date Collected: 03/21/18 00:00
Matrix: Air
Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:44	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2633 M0010 QC XAD-2 TB

Lab Sample ID: 140-11059-25

Date Collected: 03/22/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:47	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: D-2636 M0010 QC IMP MEOH/ 5% NH4OH PB

Lab Sample ID: 140-11059-26

Date Collected: 03/21/18 00:00

Matrix: Air

Date Received: 03/24/18 11:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 13:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-409031/1-A

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-409032/1-A

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:10	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-409035/1-A

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-404345/13
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			404345	02/08/18 13:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409031/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	409031	03/26/18 09:21		TAL DEN
Total/NA	Analysis	8321A		1			409698	03/30/18 11:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409032/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	409032	03/26/18 09:24		TAL DEN
Total/NA	Analysis	8321A		1			409699	03/30/18 12:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-409035/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-409035/14-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:15	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample

Date Collected: N/A
Date Received: N/A

Lab Sample ID: LLCS 280-409035/15-A

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	409035	03/26/18 19:00	AAH	TAL DEN
Total/NA	Analysis	8321A		1			410188	04/04/18 08:18	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Chemours Company FC, LLC The
Project/Site: Fayetteville Polymer Stack - M0010

TestAmerica Job ID: 140-11059-1

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-18
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-19
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-18
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-18
Kentucky (DW)	State Program	4	90101	12-31-18
Louisiana	NELAP	6	83979	06-30-18
Louisiana (DW)	NELAP	6	LA160005	12-31-18
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-18
New Jersey	NELAP	2	TN001	06-30-18
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-18
North Carolina (WW/SW)	State Program	4	64	12-31-18
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-18
Oregon	NELAP	10	TNI0189	01-01-19
Pennsylvania	NELAP	3	68-00576	12-31-18
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-18
US Fish & Wildlife	Federal		LE-058448-0	07-31-18
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-18
Virginia	NELAP	3	460176	09-14-18
Washington	State Program	10	C593	01-19-19
West Virginia (DW)	State Program	3	9955C	12-31-18
West Virginia DEP	State Program	3	345	04-30-18
Wisconsin	State Program	5	998044300	08-31-18

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18 *
Illinois	NELAP	5	200017	04-30-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Denver (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11059-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 404345

Lab Sample ID: STD001 280-404345/3 IC Client Sample ID:

Date Analyzed: 02/08/18 13:05 Lab File ID: hfpo718B08034.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Assign Peak	meyera	02/08/18 15:19

Lab Sample ID: STD002 280-404345/4 IC Client Sample ID:

Date Analyzed: 02/08/18 13:08 Lab File ID: hfpo718B08035.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:19

Lab Sample ID: DLCK 280-404345/13 Client Sample ID:

Date Analyzed: 02/08/18 13:38 Lab File ID: hfpo718B08044.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	02/08/18 15:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-11059-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 410188

Lab Sample ID: LLCS 280-409035/15-A Client Sample ID:

Date Analyzed: 04/04/18 08:18 Lab File ID: hfpo718D04007.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.98	Baseline	meyera	04/04/18 12:22

Lab Sample ID: 140-11059-3 Client Sample ID: D-2605 M0010 RUN 1 COND

Date Analyzed: 04/04/18 08:41 Lab File ID: hfpo718D04014.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.00	Baseline	meyera	04/04/18 12:23

Lab Sample ID: 140-11059-11 Client Sample ID: D-2619 M0010 RUN 3 COND

Date Analyzed: 04/04/18 08:47 Lab File ID: hfpo718D04016.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.98	Baseline	meyera	04/04/18 12:23

APPENDIX D
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS FOR HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 1 | **Test Date: 3/19/2018**
Test Location: Divison | **Test Period: 1613-1808**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$C_1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$C_1 = \frac{1001.5 \times 2.2046 \times 10\text{-}9}{35.854}$$

$$= 6.16E\text{-}08$$

Where:

W = Weight of HFPO Dimer Acid collected in sample in ug.

C_1 = HFPO Dimer Acid concentration, lbs/dscf.

2.2046×10^{-9} = Conversion factor from ug to lbs.

2. HFPO Dimer Acid concentration, ug/dscm.

$C_2 = W / (Vm(std) \times 0.02832)$

$C_2 = 1001.5 / (35.854 \times 0.02832)$

$= 9.86E+02$

Where:

C_2 = HFPO Dimer Acid concentration, ug/dscm.

0.02832 = Conversion factor from cubic feet to cubic meters.

3. HFPO Dimer Acid mass emission rate, lbs/hr.

PMR1 = C_1 x Qs(std) x 60 min/hr

PMR1 = 6.16E-08 x 27945 x 60

= 1.03E-01

Where:

PMR1 = HFPO Dimer Acid mass emission rate, lbs/hr.

4. HFPO Dimer Acid mass emission rate, g/sec.

PMR2 = PMR1 x 453.59 / 3600

PMR2 = 1.03E-01 x 453.59 /3600

= 1.30E-02

Where:

PMR2 = HFPO Dimer Acid mass emission rate, g/sec.

453.6 = Conversion factor from pounds to grams.

3600 = Conversion factor from hours to seconds.

SAMPLE CALCULATIONS FOR
FLOW, MOISTURE AND ISO

Client: Chemours	**Plant: Fayetteville, NC**
Test Number: Run 1	**Test Date: 3/19/2018**
Test Location: Divison	**Test Period: 1613-1808**

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{delta\ H}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 0.9890 \times 37.067 \times \left(29.78 + \frac{0.534}{13.6} \right)}{77.83 + 460} = 35.854$$

Where:

Vm(std) =	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Vm =	Volume of gas sample measured by the dry gas meter at meter conditions, dcf.
Pb =	Barometric Pressure, in Hg.
delt H =	Average pressure drop across the orifice meter, in H_2O
Tm =	Average dry gas meter temperature , deg F.
Y =	Dry gas meter calia!bration factor.
17.64 =	Factor that includes ratio of standard temperature (528 deg R) to standard pressure (29.92 in. Hg), deg R/in. Hg.
13.6 =	Specific gravity of mercury.

2. Volume of water vapor in the gas sample corrected to standard conditions, scf.

$$Vw(std) = (0.04707 \times Vwc) + (0.04715 \times Wwsg)$$

$$Vw(std) = (0.04707 \times 8.0) + (0.04715 \times 13.5) = 1.013$$

Where:

Vw(std) =	Volume of water vapor in the gas sample corrected to standard conditions, scf.
Vwc =	Volume of liquid condensed in impingers, ml.
Wwsg =	Weight of water vapor collected in silica gel, g.
0.04707 =	Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.
0.04715 =	Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{1.013}{1.013 + 35.854} = 0.027$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$Md = 1 - bws$$

$$Md = 1 - 0.027 = 0.973$$

Where:

Md = Mole fraction of dry gas, dimensionless.

5. Dry molecular weight of gas stream, lb/lb-mole.

$$MWd = (0.440 \times \%\ CO_2) + (0.320 \times \%\ O_2) + (0.280 \times (\%\ N_2 + \%\ CO))$$

$$MWd = (0.440 \times 0.0) + (0.320 \times 20.9) + (0.280 \times (79.1 + 0.00))$$

$$= 28.84$$

Where:

MWd = Dry molecular weight , lb/lb-mole.
% CO2 = Percent carbon dioxide by volume, dry basis.
$\%\ O_2$ = Percent oxygen by volume, dry basis.
$\%\ N_2$ = Percent nitrogen by volume, dry basis.
% CO = Percent cara!bon monoxide by volume, dry basis.
0.440 = Molecular weight of carbon dioxide, divided by 100.
0.320 = Molecular weight of oxygen, divided by 100.
0.280 = Molecular weight of nitrogen or cara!bon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

$$MWs = (MWd \times Md) + (18 \times (1 - Md))$$

$$MWs = (28.84 \times 0.973) +(18 (1 - 0.973)) = 28.54$$

Where:

MWs = Molecular weight of wet gas, lb/lb-mole.
18 = Molecular weight of water, lh/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 1.233327 \times \left(\frac{554}{29.72 \times 28.54} \right)^{\wedge}1/2 = 71.6$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, $\frac{\text{ft/sec} \times \text{(lb/lb-mole)(in. Hg)}^{1/2}}{\text{(deg R)(in } H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = $Pb + \frac{P(static)}{13.6}$

delta p = Velocity head of stack, in. H_2O

8. Average gas stream volumetric flowrate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 71.6 \times 7.07 = 30364$$

Where:

Qs(act) = Volumetric flowrate of wet stack gas at actual conditions, wacf/min.

As = Cross-sectional area of stack, ft^2.

60 = Conversion factor from seconds to minutes.

9. Average gas stream dry volumetric flowrate at standard conditions, dscf/min.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.973 \times \frac{29.72}{554} \times 30364$$

$$= 27945$$

Where:

Qs(std) = Volumetric flowrate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 554 \times 35.854}{71.6 \times 90 \times 29.72 \times 0.973 \times (0.135)^{\wedge}2} = 101.4$$

Where:

I =	Percent of isokinetic sampling.
O =	Total sampling time, minutes.
Dn =	Diameter of nozzle, inches.
17.327 =	Factor which includes standard temperature (528 deg R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $D^{2/4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator PM | **Meter Box Number** 30 | **Ambient Temp** 71

Date 4-Feb-18 | **Wet Test Meter Number** P-2952 | **Temp Reference Source** Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 17485131

Baro Press, in Hg (Pb)	29.84

Setting	Gas Volume		Temperatures					Calibration Results	
Orifice Manometer	Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter					
in H_20 (ΔH)	ft^3 (Vw)	ft^3 (Vd)	°F (Tw)	Outlet, °F (Td_o)	Inlet, °F (Td_i)	Average, °F (Td)	Time, min (O)	Y	ΔH
0.5	5.0	561.946	70.0	67.00	67.00	68.0	12.7	0.9974	1.8231
		566.934		69.00	69.00				
		4.988		68.00	68.00				
1.0	5.0	566.934	70.0	69.00	69.00	70.0	9.0	0.9957	1.8242
		571.943		71.00	71.00				
		5.009		70.00	70.00				
1.5	10.0	571.943	70.0	71.00	71.00	72.5	15.3	0.9875	1.9677
		582.080		74.00	74.00				
		10.137		72.50	72.50				
2.0	10.0	582.080	70.0	74.00	74.00	74.5	13.3	0.9845	1.9751
		592.273		75.00	75.00				
		10.193		74.50	74.50				
3.0	10.00	592.273	70.0	75.00	75.00	76.0	10.8	0.9798	1.9481
		602.519		77.00	77.00				
		10.246		76.00	76.00				
							Average	**0.9890**	**1.9077**

Vw - Gas Volume passing through the wet test meter
Vd - Gas Volume passing through the dry gas meter
Tw - Temp of gas in the wet test meter
Tdi - Temp of the inlet gas of the dry gas meter
Tdo - Temp of the outlet gas of the dry gas meter
Td - Average temp of the gas in the dry gas meter

0 - Time of calibration run
Pb - Barometric Pressure
ΔH - Pressure differential across orifice
Y - Ratio of accuracy of wet test meter to dry gas meter

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

Reference Temperature	Temperature Reading from Individual Thermocouple Input [1]						Average Temperature Reading	Temp Difference [2] (%)
Select Temperature ○ °C ◉ °F	Channel Number							
	1	2	3	4	5	6		
32	32	32	32	32	32		32.0	0.0%
212	212	213	213	212	212		212.4	-0.1%
932	932	933	933	932	932		932.4	0.0%
1832	1832	1832	1832	1832	1832		1832.0	0.0%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(°F) + 460) - (\text{Test Temp}(°F) + 460)}{\text{Reference Temp}(°F) + 460} \right]$$

Y Factor Calibration Check Calculation

METER BOX NO. 30

3/23/2018

	Run 1	Run 2	Run 3
MWd = Dry molecular weight source gas, lb/lb-mole.			
0.32 = Molecular weight of oxygen, divided by 100.			
0.44 = Molecular weight of carbon dioxide, divided by 100.			
0.28 = Molecular weight of nitrogen or carbon monoxide, divided by 100.			
% CO_2 = Percent carbon dioxide by volume, dry basis.	0.0	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9	20.9

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84	28.84

Tma = Source Temperature, absolute($^{\circ}$R)			
Tm = Average dry gas meter temperature , deg F.	58.0	72.7	79.7

$$Tma = Ts + 460$$

$$Tma = 58.03 + 460$$

Tma =	518.03	532.72	539.66

Ps = Absolute meter pressure, inches Hg.			
13.60 = Specific gravity of mercury.			
delta H = Avg pressure drop across the orifice meter during sampling, in H2O	1.261	1.330	1.349
Pb = Barometric Pressure, in Hg.	30.29	30.29	30.21

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.29 + (1.260625 / 13.6)$$

Pm =	30.38	30.39	30.31

Yqa = dry gas meter calibration check value, dimensionless.			
0.03 = (29.92/528)(0.75)2 (in. Hg/°/R) cfm2.			
29.00 = dry molecular weight of air, lb/lb-mole.			
Vm = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.	58.024	60.895	60.905
Y = Dry gas meter calibration factor (based on full calibration)	0.9890	0.9890	0.9890
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	1.9077	1.9077	1.9077
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.1228	1.1533	1.1616
O = Total sampling time, minutes.	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 58.02) * SQRT (0.0319 * 518.03 * 29) / (1.91 * 30.38 * 28.84) * 1.12$$

$$Yqa = 1.654 * SQRT\ 479.231 / 1{,}671.217 * 1.12$$

Yqa =	0.995	0.987	1.002

Diff = Absolute difference between Yqa and Y			

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((0.989 - 0.995) / 0.989) * 100$$

Diff =	**0.61**	**0.20**	**1.31**

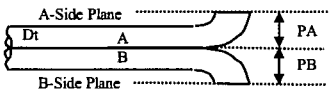
Average Diff = 0.71
Allowable = 5.0

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-563**

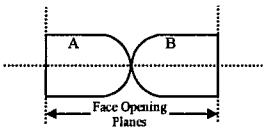
Inspection Date 2/19/18 Individual Conducting Inspection KS

If all Criteria PASS Cp is equal to 0.84

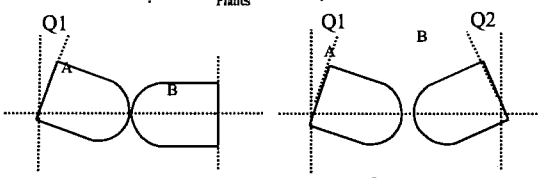


		PASS/FAIL
Distance to A Plane (PA) - inches	0.469	PASS
Distance to B Plane (PB) - inches	0.469	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

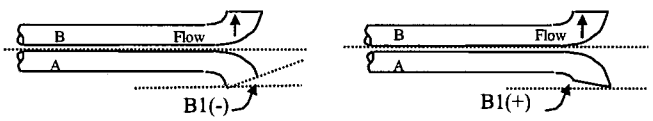


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS

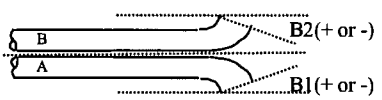


Angle of Q1 from vertical A Tube- degrees (absolute)	1	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	1	PASS

Q1 and Q2 must be ≤ 10°

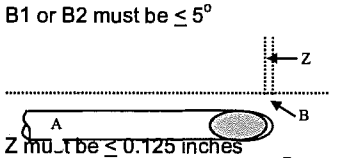


Angle of B1 from vertical A Tube- degrees (absolute)	2	PASS

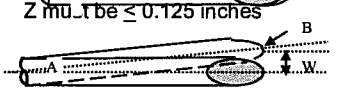


Angle of B1 from vertical B Tube- degrees (absolute)	1	PASS

B1 or B2 must be ≤ 5°

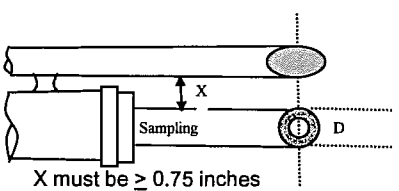


Horizontal offset between A and B Tubes (Z) - inches	0.006	PASS

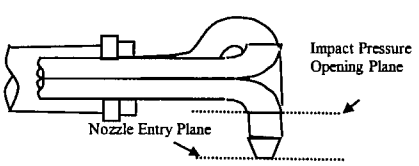


Vertical offset between A and B Tubes (W) - inches	0.012	PASS

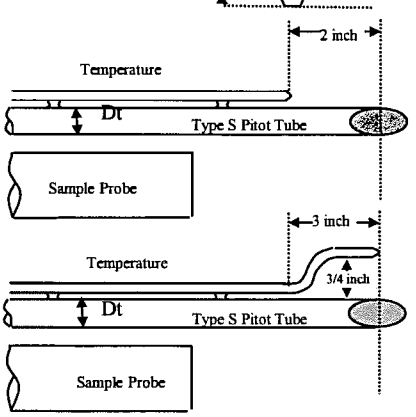
W must be ≤ 0.03125 inches



Distance between Sample Nozzle and Pitot (X) - inches	0.9325	PASS



Impact Pressure Opening Plane is above the Nozzle Entry Plane: ◉ YES ○ NO ○ NA



Thermocouple meets the Distance Criteria in the adjacent figure: ◉ YES ○ NO ○ NA

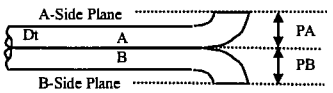
Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-694**

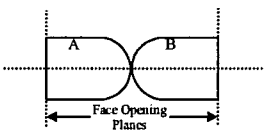
Inspection Date 2/19/18 Individual Conducting Inspection KS

If all Criteria PASS Cp is equal to 0.84

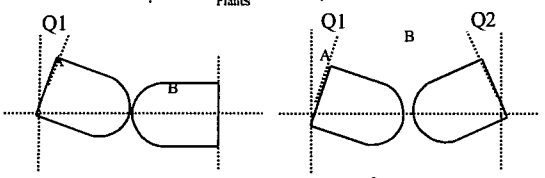


		PASS/FAIL
Distance to A Plane (PA) - inches	0.432	PASS
Distance to B Plane (PB) - inches	0.432	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

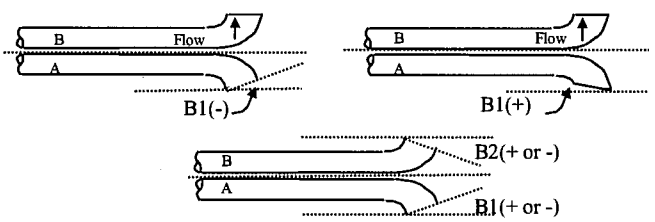


Are Open Faces Aligned Perpendicular to the Tube Axis ◉ YES ○ NO PASS



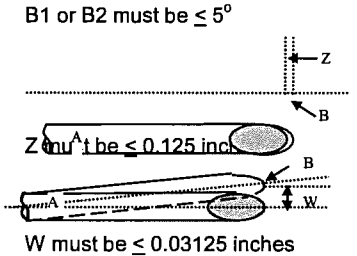
Angle of Q1 from vertical A Tube- degrees (absolute)	4	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	3	PASS

Q1 and Q2 must be ≤ 10°



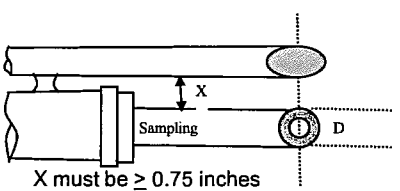
Angle of B1 from vertical A Tube- degrees (absolute)	4	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	2	PASS

B1 or B2 must be ≤ 5°



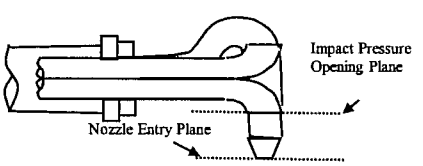
Horizontal offset between A and B Tubes (Z) - inches	0.024	PASS
Vertical offset between A and B Tubes (W) - inches	0.028	PASS

W must be ≤ 0.03125 inches

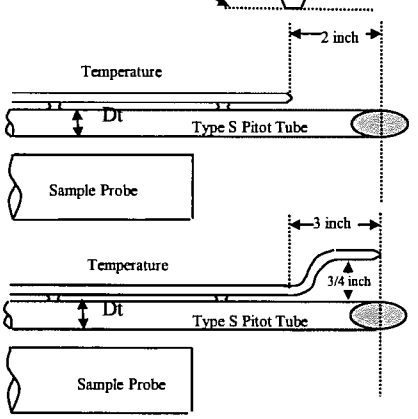


Distance between Sample Nozzle and Pitot (X) - inches	0.962	PASS

X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane ◉ YES ○ NO ○ NA



Thermocouple meets the Distance Criteria in the adjacent figure ◉ YES ○ NO ○ NA

Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ◉ NA

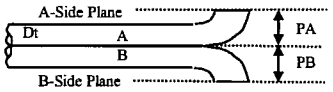
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-695**

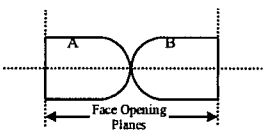
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS Cp is equal to 0.84

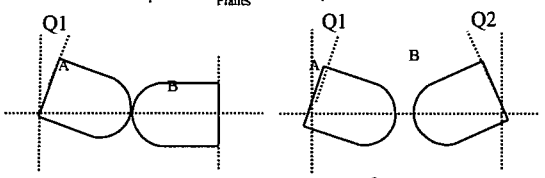
		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	



$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

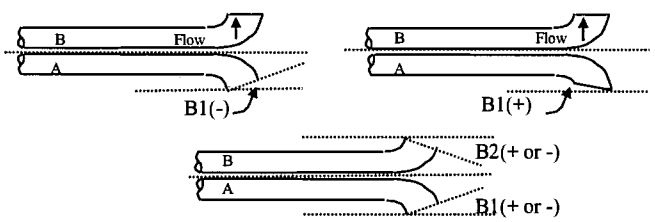


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



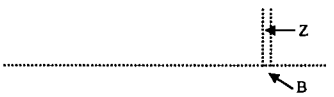
Q1 and Q2 must be ≤ 10°

Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	1	PASS

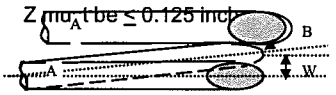


B1 or B2 must be ≤ 5°

Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

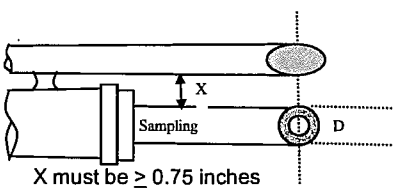


Z must be ≤ 0.125 inch



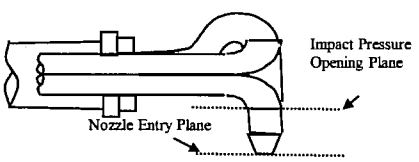
W must be ≤ 0.03125 inches

Horizontal offset between A and B Tubes (Z) - inches	0.006	PASS
Vertical offset between A and B Tubes (W) - inches	0.018	PASS

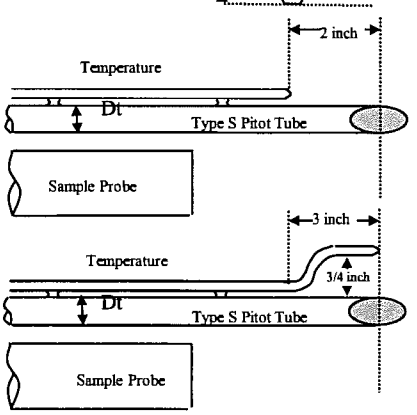


X must be ≥ 0.75 inches

Distance between Sample Nozzle and Pitot (X) - inches	0.78	PASS



Impact Pressure Opening Plane is above the Nozzle Entry Plane: ◉ YES ○ NO ○ NA



Thermocouple meets the Distance Criteria in the adjacent figure: ◉ YES ○ NO ○ NA

Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

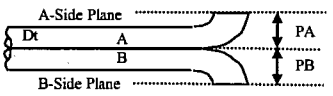
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-696**

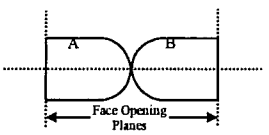
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS Cp is equal to 0.84

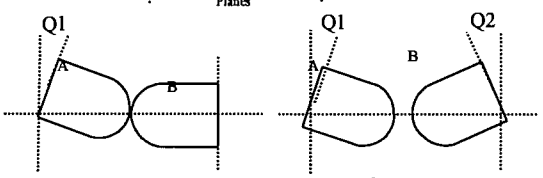
		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	



$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

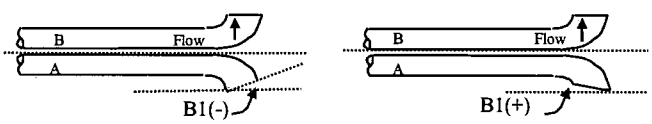


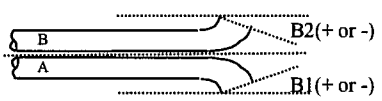
Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



Q1 and Q2 must be ≤ 10°

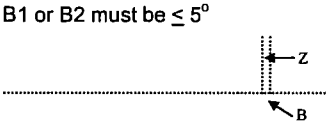
Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS



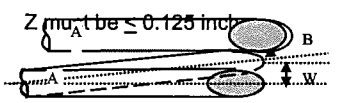


B1 or B2 must be ≤ 5°

Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

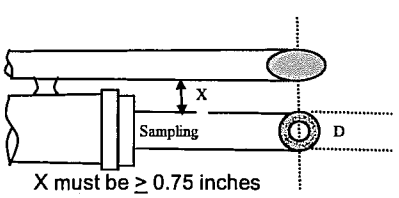


Z must be ≤ 0.125 inch



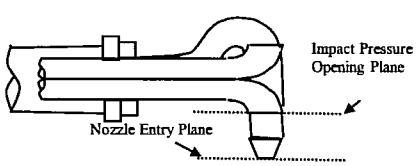
W must be ≤ 0.03125 inches

Horizontal offset between A and B Tubes (Z) - inches	0.005	PASS
Vertical offset between A and B Tubes (W) - inches	0.014	PASS

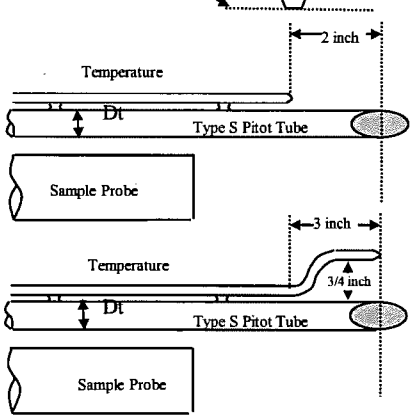


X must be ≥ 0.75 inches

Distance between Sample Nozzle and Pitot (X) - inches	0.8	PASS



Impact Pressure Opening Plane is above the Nozzle Entry Plane: ◉ YES ○ NO ○ NA



Thermocouple meets the Distance Criteria in the adjacent figure: ◉ YES ○ NO ○ NA

Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

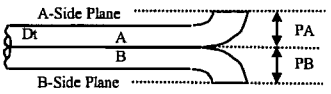
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-697**

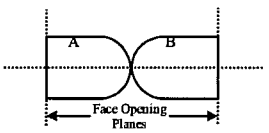
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS Cp is equal to 0.84

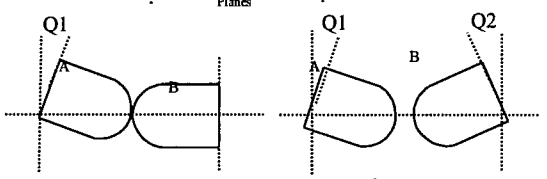
		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	



$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

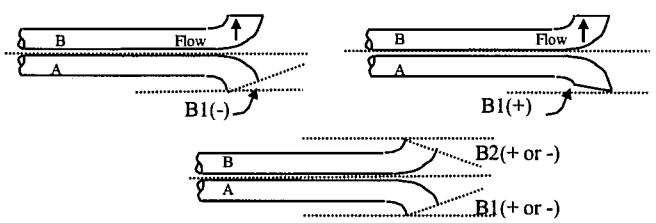


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



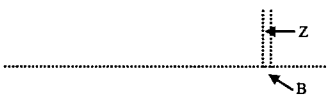
Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be ≤ 10°



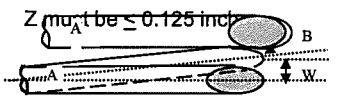
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°



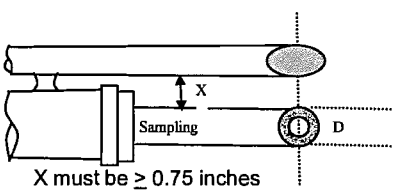
Horizontal offset between A and B Tubes (Z) - inches	0.007	PASS

Z must be ≤ 0.125 inch



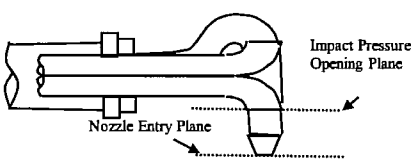
Vertical offset between A and B Tubes (W) - inches	0.018	PASS

W must be ≤ 0.03125 inches

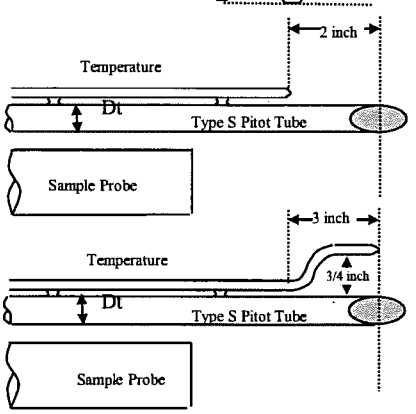


Distance between Sample Nozzle and Pitot (X) - inches	0.8	PASS

X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: ◉ YES ○ NO ○ NA



Thermocouple meets the Distance Criteria in the adjacent figure: ◉ YES ○ NO ○ NA

Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A00E4	Reference Number:	82-401002887-1
Cylinder Number:	CC351431	Cylinder Volume:	150.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Oct 02, 2017

Expiration Date: Oct 02, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	9.000 %	8.898 %	G1	+/- 0.7% NIST Traceable	10/02/2017
OXYGEN	12.00 %	12.01 %	G1	+/- 0.4% NIST Traceable	10/02/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061336	CC360792	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRMplus	09060208	CC262337	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Sep 28, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Sep 28, 2017

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A00E4	Reference Number:	82-401002887-1
Cylinder Number:	CC317774	Cylinder Volume:	150.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Oct 02, 2017

Expiration Date: Oct 02, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	9.000 %	8.944 %	G1	+/- 0.7% NIST Traceable	10/02/2017
OXYGEN	12.00 %	11.99 %	G1	+/- 0.5% NIST Traceable	10/02/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061336	CC360792	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRMplus	09060208	CC262337	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Sep 28, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Sep 28, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI62E15A0224	Reference Number:	82-401044874-1
Cylinder Number:	SG9169108	Cylinder Volume:	157.2 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Nov 18, 2017

Expiration Date: Nov 18, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	17.00 %	16.58 %	G1	+/- 0.7% NIST Traceable	11/18/2017
OXYGEN	21.00 %	21.00 %	G1	+/- 0.5% NIST Traceable	11/18/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061336	CC360792	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRM	09061415	CC273526	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Oct 30, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Oct 27, 2017

Triad Data Available Upon Request

Signature on file
Approved for Release

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - O_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 21.09 %
Pollutant: 21.09% O_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[a]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	0.00	-0.01	0.00
NO (445 ppm CC346681)	0.00	0.02	0.11
NO_2 (23.78 ppm CC500749)	NA	NA	NA
N_2O (90.4 ppm CC352661)	0.00	0.05	0.24
CO (461.5 ppm XC006064B)	0.00	0.02	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.05	0.23
CH_4 (453.1 ppm SG901795)	NA	NA	NA
H_2 (552 ppm ALM048043)	0.00	0.09	0.44
HCl (45.1 ppm CC17830)	0.00	0.03	0.14
NH_3 (9.69 ppm CC58181)	0.00	0.01	0.03
TOTAL INTERFERENCE RESPONSE			**1.20**
METHOD SPECIFICATION			**<2.5%**

[a] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - CO_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 16.65%
Pollutant: 16.65% CO_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[(a)]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	NA	NA	NA
NO (445 ppm CC346681)	0.00	0.02	0.10
NO_2 (23.78 ppm CC500749)	0.00	0.00	0.02
N_2O (90.4 ppm CC352661)	0.00	0.01	0.04
CO (461.5 ppm XC006064B)	0.00	0.01	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.11	0.64
CH_4 (453.1 ppm SG901795)	0.00	0.07	0.44
H_2 (552 ppm ALM048043)	0.00	0.04	0.22
HCl (45.1 ppm CC17830)	0.10	0.06	0.60
NH_3 (9.69 ppm CC58181)	0.00	0.02	0.14
TOTAL INTERFERENCE RESPONSE			**2.19**
METHOD SPECIFICATION			**< 2.5%**

[(a)] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

NOZZLE CALIBRATION DATA FORM

Date: 3/19/18 **Calibrated by:** SR

Nozzle Identification Number	Nozzle Diameter, Inches[1]			ΔD,[2]	D_{avg}[3]
	D_1	D_2	D_3		
6.135	0.135	0.134	0.135	0.001	0.135
6.215	0.215	0.215	0.215	0	0.215
6.235	0.235	0.234	0.236	0.002	0.235

Where:

1 D1,2,3 = Three different nozzle diameters, inches; each diameter must be measured to nearest 0.001 in.

2 ΔD = Maximum difference between any two diameters, inches. ΔD must be ≤ 0.004 in.

3 D_{avg} = Nozzle diameter = average of D_1, D_2, and D_3.

APPENDIX F
LIST OF PROJECT PARTICIPANTS

The following WESTON employees participated in this project.

Paul Meeter	Senior Project Manager
Steve Rathfon	Team Leader
Kyle Schweitzer	Team Member
Matt Winkeler	Team Member