FLUOROMONOMERS, IXM AND PPA MANUFACTURING PROCESSES EMISSIONS TEST REPORT TEST DATES: 22-25 JANUARY 2018

THE CHEMOURS COMPANY FAYETTEVILLE, NORTH CAROLINA

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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 Polymer Processing Aid (PPA) manufacturing areas, Wastewater Treatment, and Powerhouse.

Chemours contracted Weston Solutions, Inc. (WESTON) to perform HFPO Dimer Acid emission testing on two sources at the facility (Division Stack and the PPA Stack). Testing was performed on 22-25 January 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 from the Division stack and PPA stack which are located in the Fluoromonomers, Nafion® and PPA 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 were measured on two sources (Division and PPA Stacks).

Tables 1-1 and 1-2 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 (HFPO-DA)	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 PPA Stack

Sampling Point & Location	**PPA Stack**				
Number of Tests:	3				
Parameters To Be Tested:	HFPO Dimer Acid (HFPO-DA)	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

Three test runs were performed on each source. One additional test run (Run No. 4) was performed on the PPA building room exhaust. Table 2-1 provides a summary of the HFPO Dimer Acid emission test results. Detailed test results summaries are provided in Section 6.

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
PPA Stack[1]	1	2.58E-2	3.25E-3
	2	7.15E-1	9.00E-2
	3	2.52E-2	3.17E-3
	Average[2]	2.55E-2	3.21E-3
PPA Bldg. Exhaust	4	5.80E-3	7.30E-4
Division Stack	1	2.46E-1	3.10E-2
	2	4.04E-1	5.09E-2
	3	2.38E-1	3.00E-2
	Average	2.96E-1	3.73E-2

1. Run No. 2 was performed at a different operating condition than Run Nos. 1 and 3. See Section 6 for a detailed description.
2. Average of Run Nos. 1 and 3 only.

3. PROCESS DESCRIPTIONS

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

3.1 POLYMER PROCESSING AID (PPA) AREA

The PPA facility produces surfactants used to produce fluoropolymer products at other Chemours facilities, such as Teflon®, as well as sales to outside producers of fluoropolymers.

Process streams are vented to a caustic wet scrubber (ACD-A1) and vented to a process stack (AEP-A1). The process inside the building is under negative pressure and the building air is vented to the process stack (AEP-A1).

3.2 FLUOROMONOMERS & IXM AREAS

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

3.3 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
PPA	AF Column Reboiler/Virgin	Continuous once it starts taking off to feed tank (Wed – Fri)
	Pressure Transfers/Virgin or Purified	Batch (pressure transfers from one vessel to another – every 2 hours)
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

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

- PPA Process
  - Caustic Wet Scrubber (ACD-A1)
    - Caustic recirculation flow rate
    - Differential pressure across the packing
- Fluoromonomers & IXM Processes
  - Division Waste Gas Scrubber
    - Caustic recirculation flow rate

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.

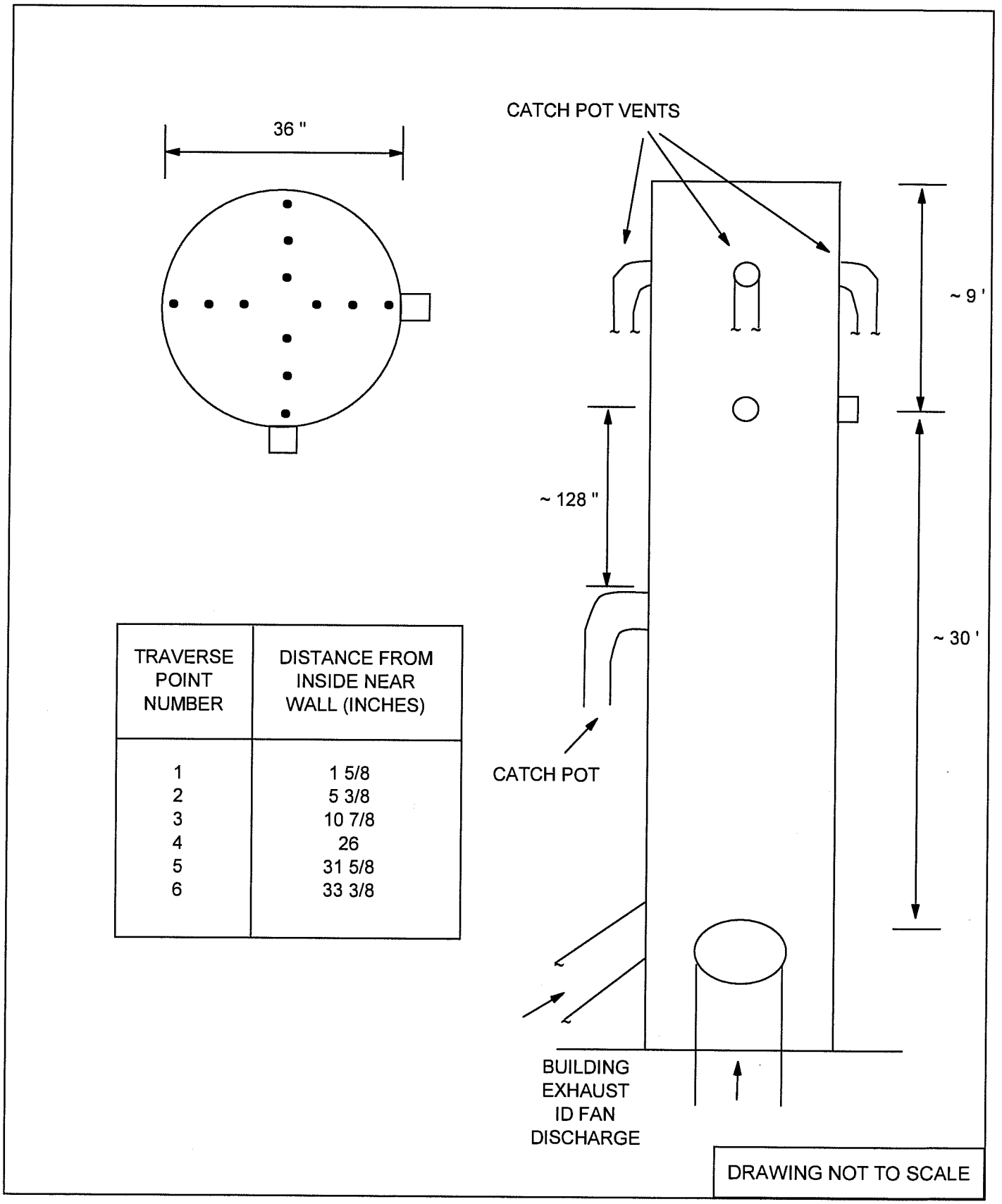
Per EPA Method 1, a total of 12 traverse points (6 per axis) were used for M-0010 isokinetic sampling. Figure 4-1 provides a schematic of the test ports and traverse point locations.

4.2 PPA PROCESS STACK

Two 4“ ID test ports are in place on the 30” ID fiberglass stack. The ports are 12’ (4.8 diameters) from the nearest downstream disturbance (waste gas scrubber demister duct) and 32’ (12.8 diameters) from the nearest upstream disturbance (stack exit.)

Per EPA Method 1, a total of 24 traverse points (12 per axis) were used for M0010 isokinetic sampling. See Figure 4-2 for a schematic of the test port and traverse point locations.

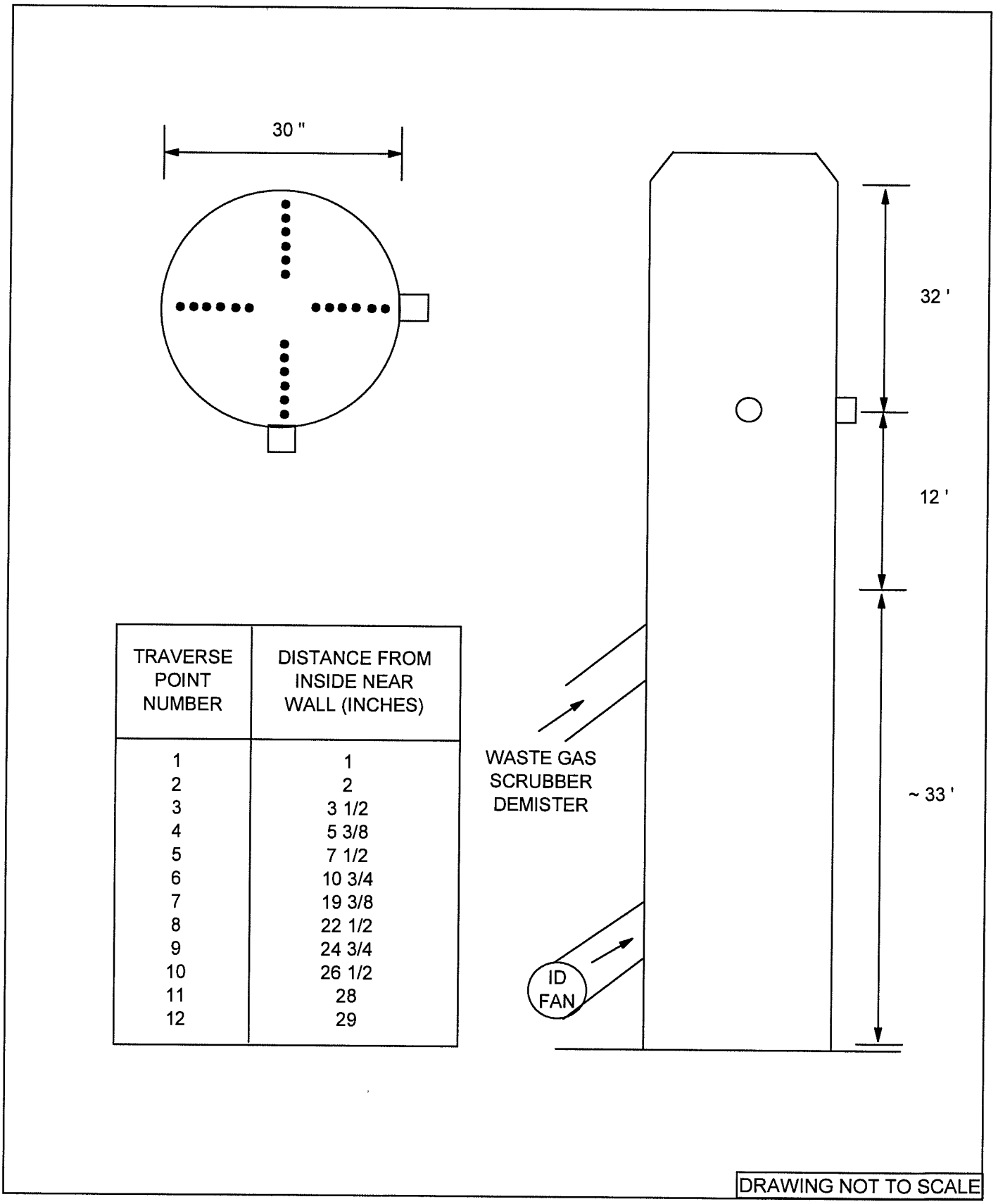
Note: All measurements at the test locations were confirmed prior to sampling.



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

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

IASDATA\CHEMOURS\15418.002.002\FIGURE 4-1 DIVISION STACK



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

FIGURE 4-2
PPA EXHAUST STACK TEST PORT
AND TRAVERSE POINT LOCATION

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.

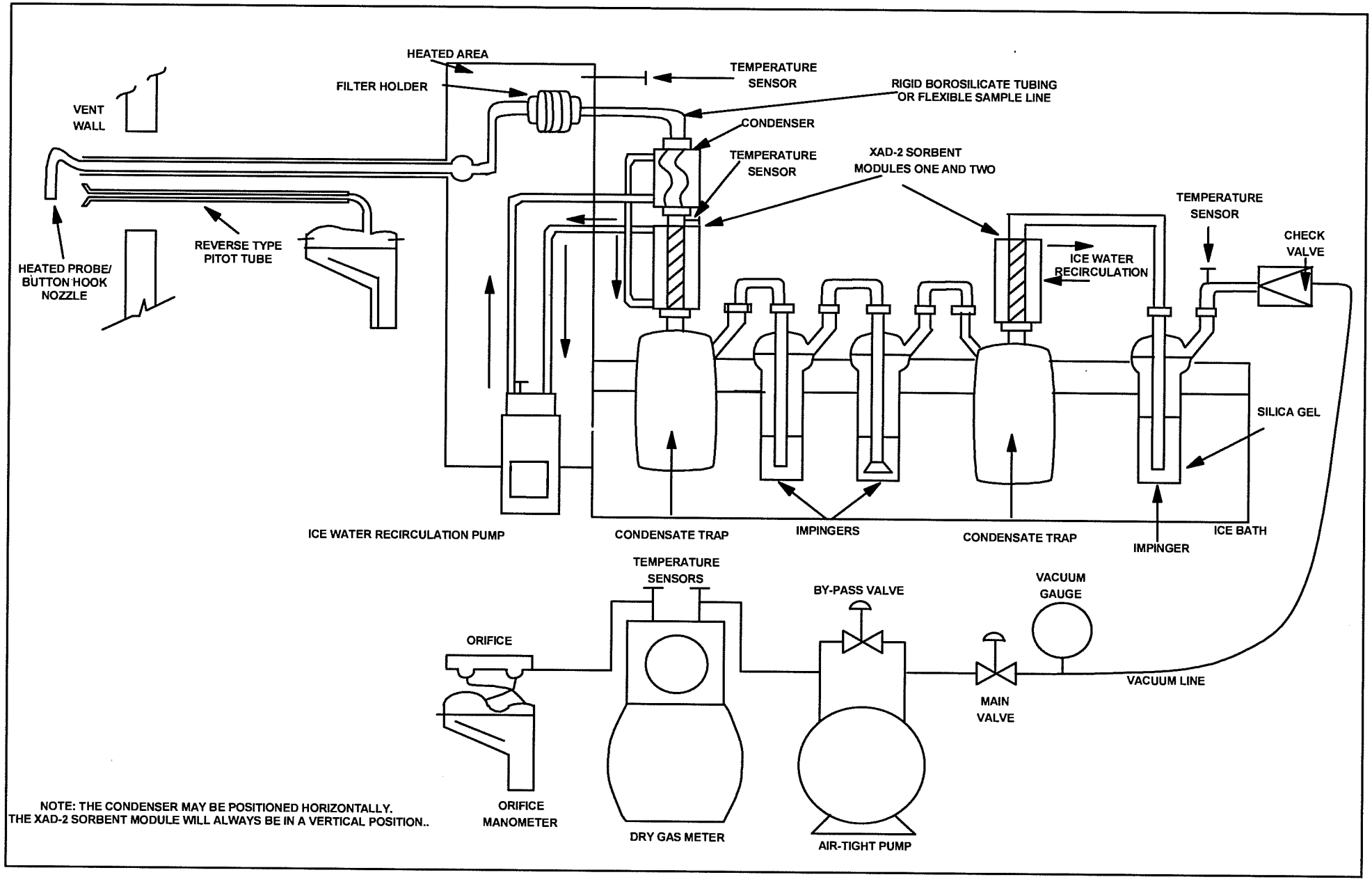


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

A section of borosilicate glass [or flexible polyethylene tubing (Division Stack 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.

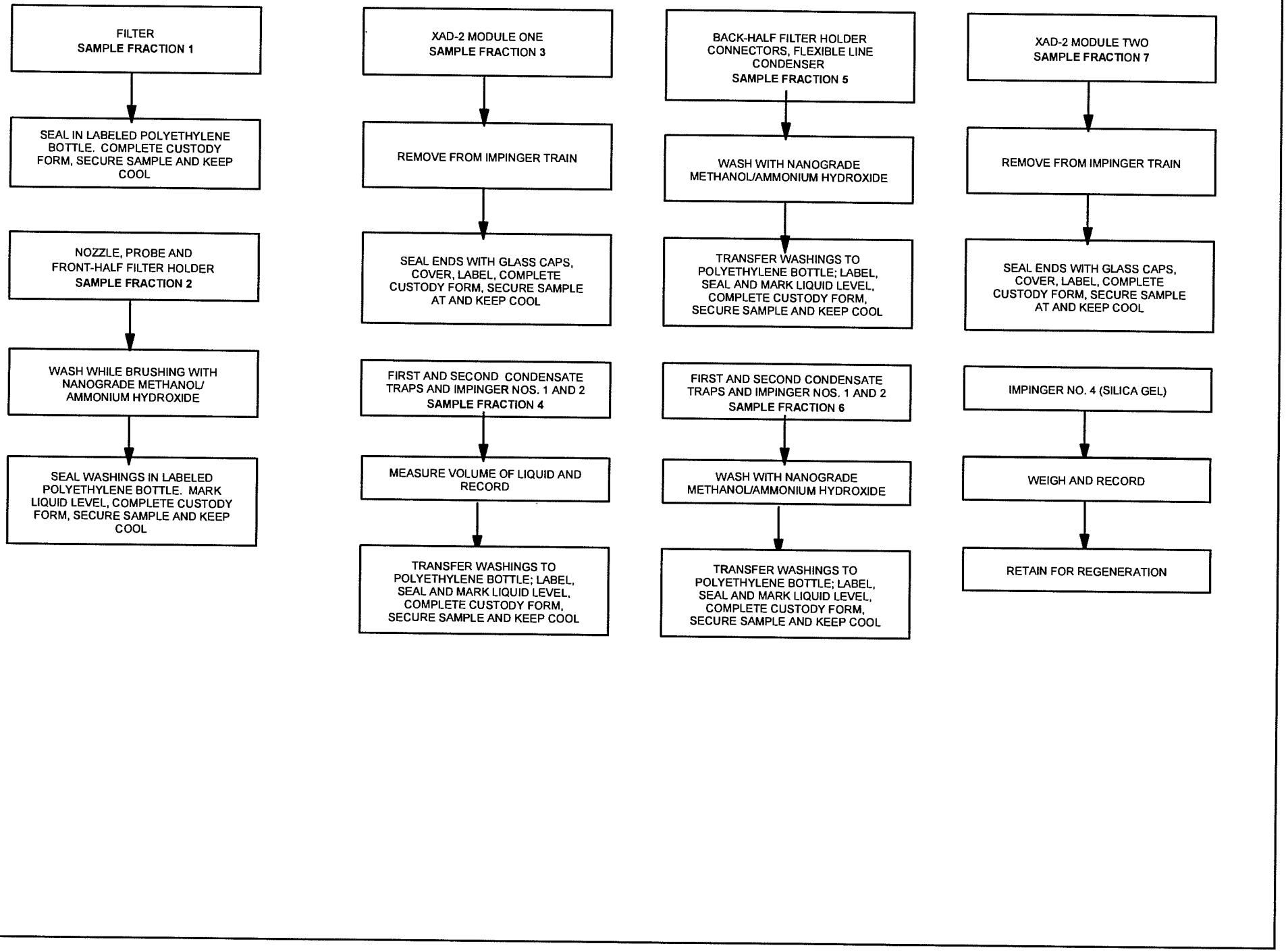


FIGURE 5-2
HFPO DIMER ACID SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

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.

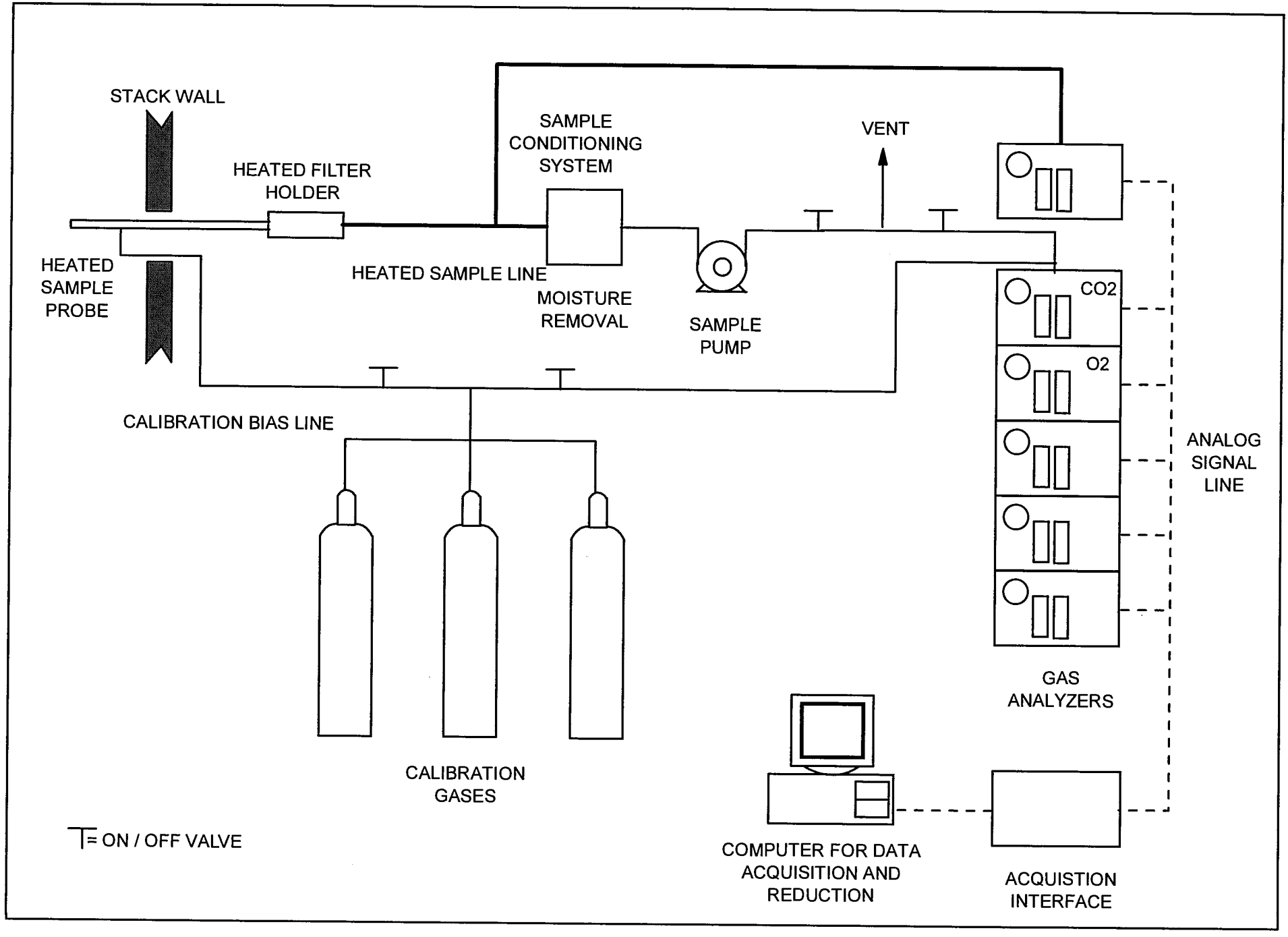


FIGURE 5-3
WESTON SAMPLING SYSTEM

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 per location were performed.

Tables 6-1 and 6-2 provide detailed test data and test results for the PPA and Division stack, 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.

During Run No. 2 on the PPA Stack, two additional batch operations occurred that did not occur during test Runs 1 and 3. The batch operations were 1) a transfer of the HFPO Dimer Acid Fluoride from a holding tank to the Hydrolysis unit and operation of the Hydrolysis operation, and 2) transfer to and operation of the vaporizer. Since the contribution of HFPO Dimer Acid Fluoride and HFPO Dimer Acid emissions from these two operations is not known, another stack test was planned and carried out the week of 26 February 2018 to test these two batch operations separately. Results from this follow-up test will be provided to NCDEQ as they become available.

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

Test Data				
Run number	1	2	3	4
Location	PPA	PPA	PPA	Bldg Exh.
Date	1/24/2018	1/24/2018	1/25/2018	1/25/2018
Time period	1152-1348	1443-1642	0900-1100	1252-1428
SAMPLING DATA:				
Sampling duration, min.	96.0	96.0	96.0	96.0
Nozzle diameter, in.	0.191	0.191	0.191	0.191
Cross sectional nozzle area, sq.ft.	0.000199	0.000199	0.000199	0.000199
Barometric pressure, in. Hg	30.14	30.14	30.42	30.47
Avg. orifice press. diff., in H_2O	0.94	0.95	0.90	0.60
Avg. dry gas meter temp., deg F	61.1	74.3	43.6	51.8
Avg. abs. dry gas meter temp., deg. R	521	534	504	512
Total liquid collected by train, ml	26.2	24.9	20.3	18.4
Std. vol. of H_2O vapor coll., cu.ft.	1.2	1.2	1.0	0.9
Dry gas meter calibration factor	0.9934	0.9934	0.9934	0.9934
Sample vol. at meter cond., dcf	50.307	50.838	47.135	40.424
Sample vol. at std. cond., dscf [(1)]	51.103	50.375	49.999	42.238
Percent of isokinetic sampling	102.7	101.5	100.9	104.4
GAS STREAM COMPOSITION DATA:				
CO_2, % by volume, dry basis	0.0	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.024	0.023	0.019	0.020
Mole fraction of dry gas	0.976	0.977	0.981	0.980
Molecular wt. of wet gas, lb/lb mole	28.58	28.59	28.63	28.62
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:				
Static pressure, in. H_2O	3.10	3.10	3.00	3.00
Absolute pressure, in. Hg	30.37	30.37	30.64	30.69
Avg. temperature, deg. F	69	68	64	66
Avg. absolute temperature, deg.R	529	528	524	526
Pitot tube coefficient	0.84	0.84	0.84	0.84
Total number of traverse points	24	24	24	24
Avg. gas stream velocity, ft./sec.	43.9	43.7	42.8	35.0
Stack/duct cross sectional area, sq.ft.	4.90	4.90	4.90	4.90
Avg. gas stream volumetric flow, wacf/min.	12913	12843	12569	10285
Avg. gas stream volumetric flow, dscf/min.	12764	12738	12714	10380

[(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	4
Location	PPA	PPA	PPA	Bldg Exh.
Date	1/24/2018	1/24/2018	1/25/2018	1/25/2018
Time period	1152-1348	1443-1642	0900-1100	1252-1428
SEMIVOLATILE ORGANICS LABORATORY REPORT DATA, ug.				
HFPO Dimer Acid	782.0	21378.2	748.9	178.3
SEMIVOLATILE ORGANICS EMISSION RESULTS, ug/dscm.				
HFPO Dimer Acid	540.3	14983.8	528.9	149.0
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/dscf.				
HFPO Dimer Acid	3.37E-08	9.36E-07	3.30E-08	9.31E-09
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/hr.				
HFPO Dimer Acid	2.58E-02	7.15E-01	2.52E-02	5.80E-03
SEMIVOLATILE ORGANICS EMISSION RESULTS, g/sec.				
HFPO Dimer Acid	3.25E-03	9.00E-02	3.17E-03	7.30E-04

TABLE 6-2
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	1/22/2018	1/23/2018	1/23/2018
Time period	1607-1807	1017-1208	1437-1628
SAMPLING DATA:			
Sampling duration, min.	90.0	90.0	90.0
Nozzle diameter, in.	0.151	0.151	0.180
Cross sectional nozzle area, sq.ft.	0.000124	0.000124	0.000177
Barometric pressure, in. Hg	30.19	29.78	29.72
Avg. orifice press. diff., in H_2O	0.70	0.73	1.49
Avg. dry gas meter temp., deg F	67.0	71.5	73.8
Avg. abs. dry gas meter temp., deg. R	527	532	534
Total liquid collected by train, ml	28.4	33.1	33.0
Std. vol. of H_2O vapor coll., cu.ft.	1.3	1.6	1.6
Dry gas meter calibration factor	0.9542	0.9934	0.9934
Sample vol. at meter cond., dcf	42.352	42.531	58.662
Sample vol. at std. cond., dscf [1,2]	40.908	41.835	57.441
Percent of isokinetic sampling	101.6	103.2	98.3
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.	0.032	0.036	0.026
Mole fraction of dry gas	0.968	0.964	0.974
Molecular wt. of wet gas, lb/lb mole	28.49	28.45	28.55
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-0.64	-0.64	-0.64
Absolute pressure, in. Hg	30.14	29.73	29.67
Avg. temperature, deg. F	88	93	95
Avg. absolute temperature, deg.R	548	553	555
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	63.8	66.0	66.7
Stack/duct cross sectional area, sq.ft.	7.07	7.07	7.07
Avg. gas stream volumetric flow, wacf/min.	27060	27996	28300
Avg. gas stream volumetric flow, dscf/min.	25448	25606	25987

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

[2] Post calibration check value used in calculations for run no.1, meter box changed for run nos. 2 and 3

TABLE 6-2(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	1/22/2018	1/23/2018	1/23/2018
Time period	1607-1807	1017-1208	1437-1628
SEMIVOLATILE ORGANICS LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	2988.6	4990.5	3983.0
SEMIVOLATILE ORGANICS EMISSION RESULTS, ug/dscm			
HFPO Dimer Acid	2579.4	4211.8	2448.2
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/dscf			
HFPO Dimer Acid	1.61E-07	2.63E-07	1.53E-07
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	2.46E-01	4.04E-01	2.38E-01
SEMIVOLATILE ORGANICS EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	3.10E-02	5.09E-02	3.00E-02

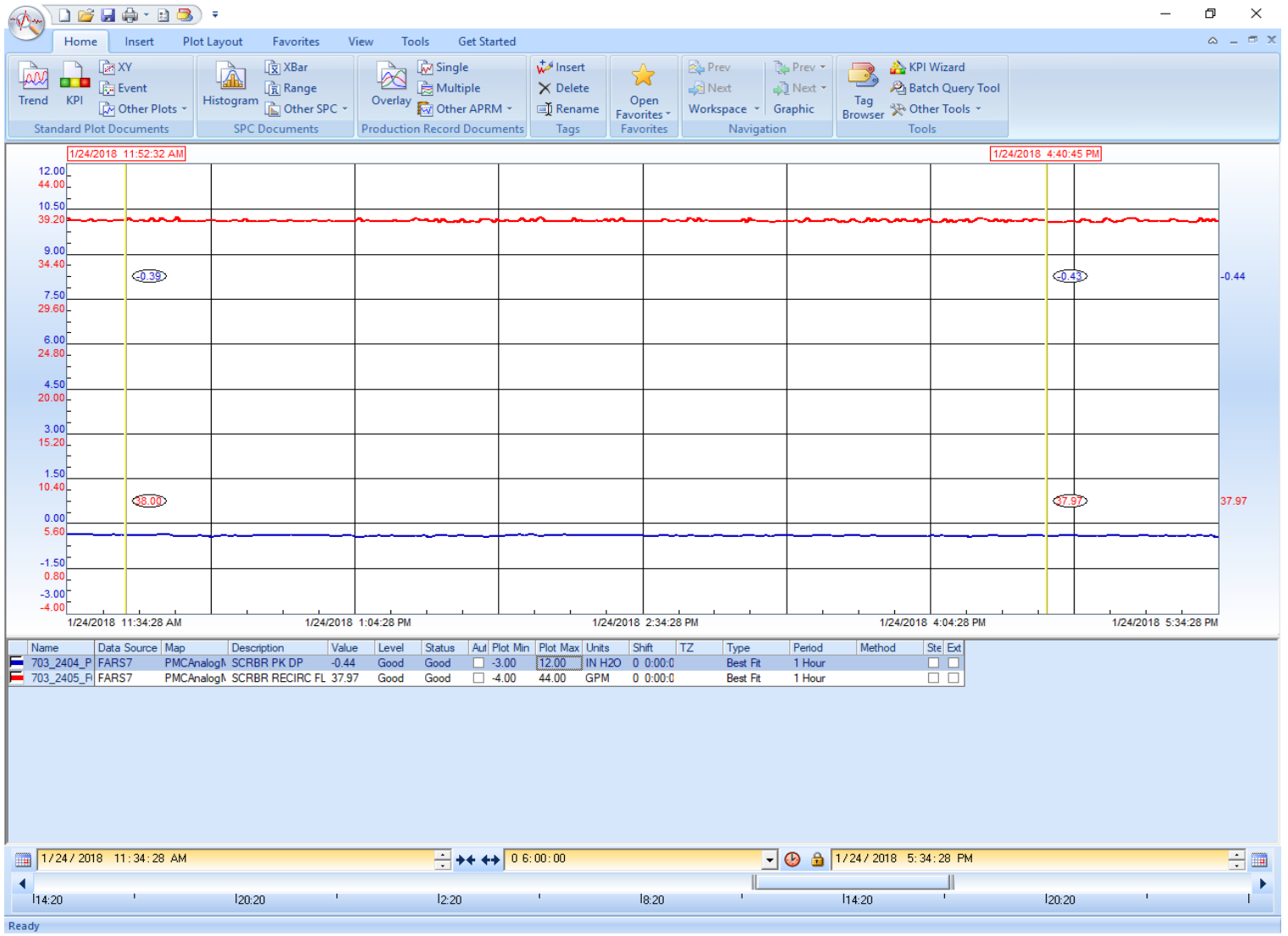
APPENDIX A
PROCESS OPERATIONS DATA

	Start date and time	End data and time	HFPO (kg/hr)	VEN			
				Condensation (kg/hr HFPO)	ABR (kg/hr Dimer)	Refining (kg/hr Crude VE)	Product
Shakedown Division	1/11/18 10:10	1/11/2018 11:40	243.97	150	200	50	PPVE
Run 1 - Division	1/22/2018 16:07	1/22/2017 18:07	297.74	150	0	50	PPVE
Run 2 - Division	1/23/2018 10:17	1/23/2018 12:08	297.9	150	200	50	PPVE
Run 3 - Division	1/23/2018 14:37	1/23/2018 16:28	304.37	150	200	50	PPVE

	Start date and time	End data and time	PPA			
			A/F Column Dis. Rate	Hydrolysis	Vaporization	902 Reactor
Shakedown PPA Stack	1/9/2018 9:26	1/9/2018 12:57	150 lb/hr	1 wash tank vent 35-0 psi; phase separate to vaporizer - no venting dropped wash tank blow-case N. Acid Tank to Hydrolysis venting 12:20 - 12:35 breathing venting feed A/F 12:36 - end of test	pulled Vap & Receiver under Vaccuum from atm - 14 psig 11:05 started steam 12:15 pm to boil and condense	no activity
Shakedown PPA Room Exhaust	1/9/2018 15:17	1/19/2018 18:17	150 lb/hr	15:40 - 16:25Wash Tk. Press tran to Hyd. 16:25 - 16:43 dropped to trailer 16:42 - Hyd. 8 -0 psig 17:13 - 17:30 S. Acid Tank pump to Hyd.	Vacuum jet pulling - finish 16:33 transfer Rec. to 902 Rx. 16:50 - 17:20 - venting to scrubber	16:47 transferred Rec. to 902 Reactor - vented

	Start date and time	End data and time	PPA			
			A/F Column Dis. Rate	Hydrolysis	Vaporization	902 Reactor
Run 1 - PPA Stack	1/24/2018 11:52	1/24/2018 13:48	200 lb/hr steady	11:59 - 12:08 Wash Tk Press Tran to Hyd 12:08 -12:28 Phase settle 12:38 - 13:26 Phase sep Hyd to Vap no venting 13:26 - end of test- gravity tran hyd to south acid tank no venting	11:52 - 11:59 Vap heels pressure transfer 13:26 - end of test - started vap cycle - pulling vacuum vent	no activity
Run 2 - PPA Stack	1/24/2018 14:43	1/24/2018 16:42	200 lb/hr steady	14:43 - 14:56 venting after press tran from North Acid tank to Hyd 14:57 - 16:11 AF tran to Hyd - venting during transfer 16:11 - 16:20 - Hyd mixing - no venting 16:20 - end of test - phase settling - no venting	14:43 - end of test - vaporization with normal venting	no activity

	Start date and time	End data and time	PPA			
			A/F Column Dis. Rate	Hydrolysis	Vaporization	902 Reactor
Run 3 - PPA Stack	1/25/2018 9:00	1/25/2018 11:00	200 lb/hr steady	9:00 - 9:06 charging water to Hyd - venting 9:06 - 9:28 charging Sulfuric acid - venting 9:28 - 9:35 vap heels to hyd press tran - venting 9:35 - 9:45 wash tank press tran to hyd - venting 9:45 - 10:05 phase settling - venting 10:05 - end of test - gravity trans to vap - no venting	9:00 to end of test - Vacuum jet vent closed	no activity
Run 4 - PPA Room Exhaust	1/25/2018 12:52	1/25/2018 14:28	200 lb/hr steady	12:52 - no venting 14:08 - end of test A/F feed - venting	12:52 - end of test - vaporization with normal venting	no activity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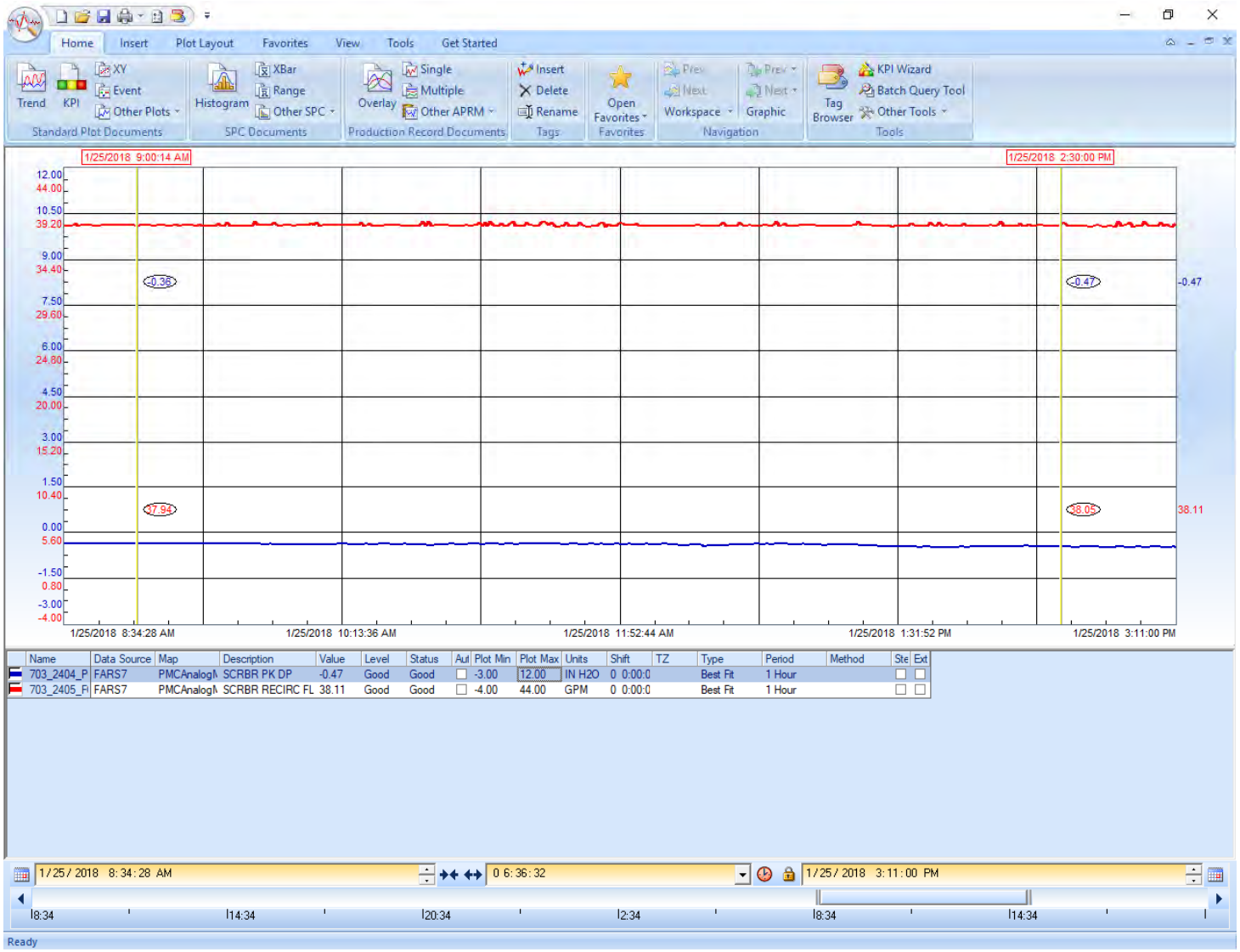
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PMCAnalogM
SCRBR RECIRC FL
38.11
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Good
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GPM
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Best Fit
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8:34
14:34
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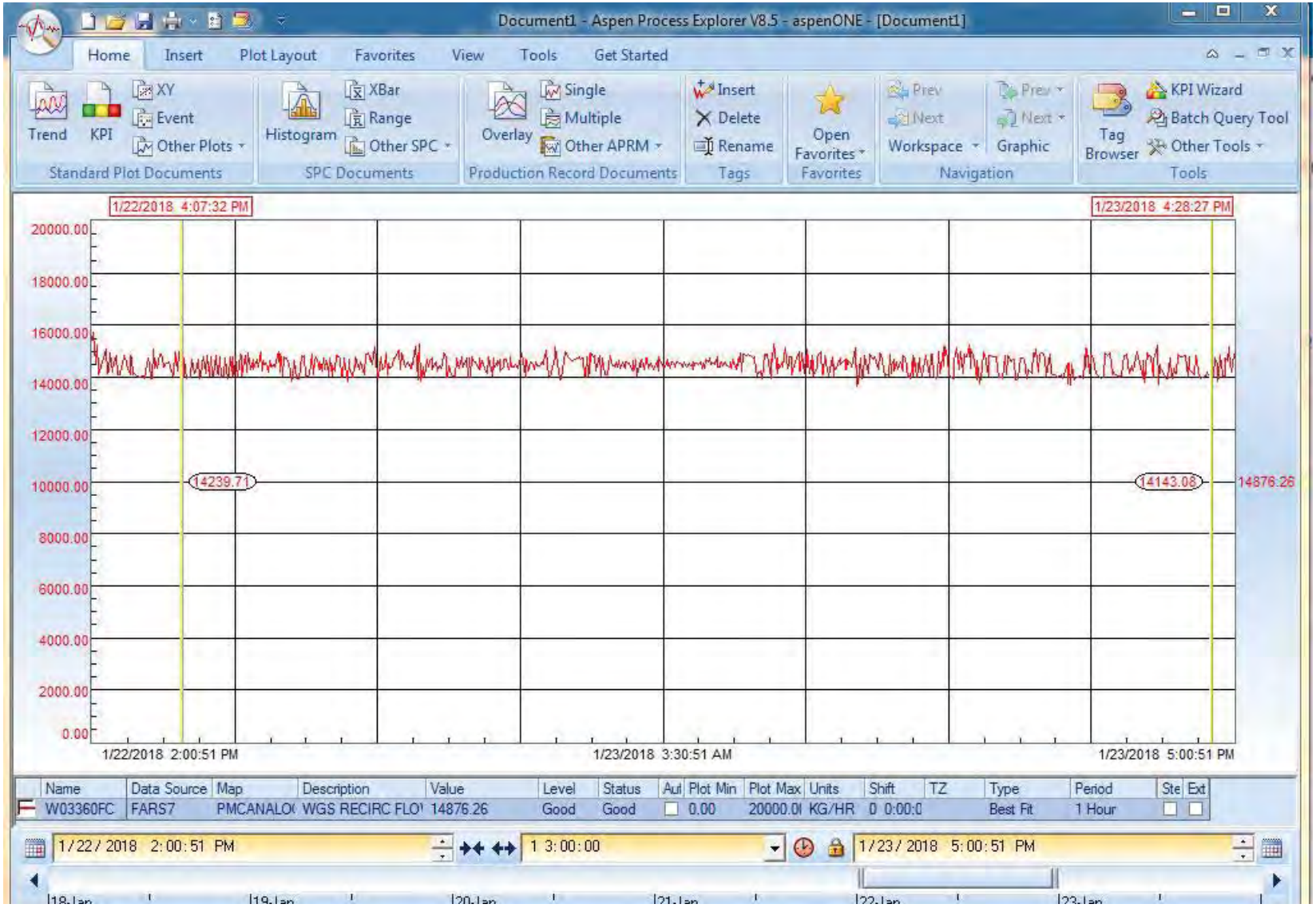
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1/23/2018 5:00:51 PM

APPENDIX B
RAW AND REDUCED TEST DATA

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR DIMER ACID CALCULATIONS

Test Data				
Run number	1	2	3	4
Location	PPA	PPA	PPA	BLDG AIR
Date	1/24/2018	1/24/2018	1/25/2018	1/25/2018
Time period	1152-1348	1443-1642	0900-1100	1252-1428
Operator	MW	MW	MW	MW
Inputs For Calcs.				
Sq. rt. delta P	0.78333	0.78018	0.77010	0.62972
Delta H	0.9413	0.9458	0.8954	0.5992
Stack temp. (deg.F)	69.2	67.8	64.3	65.7
Meter temp. (deg.F)	61.1	74.3	43.6	51.8
Sample volume (act.)	50.307	50.838	47.135	40.424
Barometric press. (in.Hg)	30.14	30.14	30.42	30.47
Volume H_2O imp. (ml)	15.0	13.0	10.0	9
Weight change sil. gel (g)	11.2	11.9	10.3	9.4
% CO_2	0.0	0.0	0.0	0
% O_2	20.9	20.9	20.9	20.9
% N_2	79.1	79.1	79.1	79.1
Area of stack (sq.ft.)	4.900	4.900	4.900	4.900
Sample time (min.)	96.0	96.0	96.0	96
Static pressure (in.H_2O)	3.10	3.10	3.00	3
Nozzle dia. (in.)	0.191	0.191	0.191	0.191
Meter box cal.	0.9934	0.9934	0.9934	0.9934
Cp of pitot tube	0.84	0.84	0.84	0.84
Traverse points	24	24	24	24

Sample and Velocity Traverse Point Data Sheet - Method 1

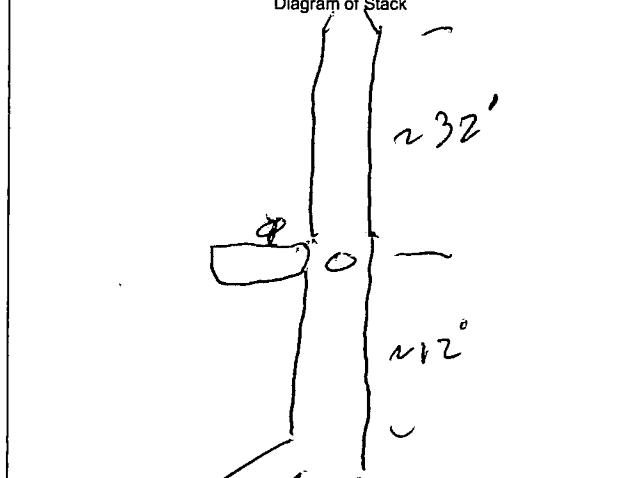
Client: Chemours
Loaction/Plant: Fayetteville NC
Source: PPA Stack
Operator: Paul
Date: 11/8/18
W.O. Number: 15418.002.002

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	45
Port Depth (in.) = D	15
Depth of Duct, diameter (in.) = C-D	30
Area of Duct (ft²)	4.90
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) —(Flange-Threaded-Hole)	4"
Monorail Length	—
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	NA
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Flow Disturbances	
Upstream - A (ft)	~32
Downstream - B (ft)	~12
Upstream - A (duct diameters)	~12.8
Downstream - B (duct diameters)	~4.8

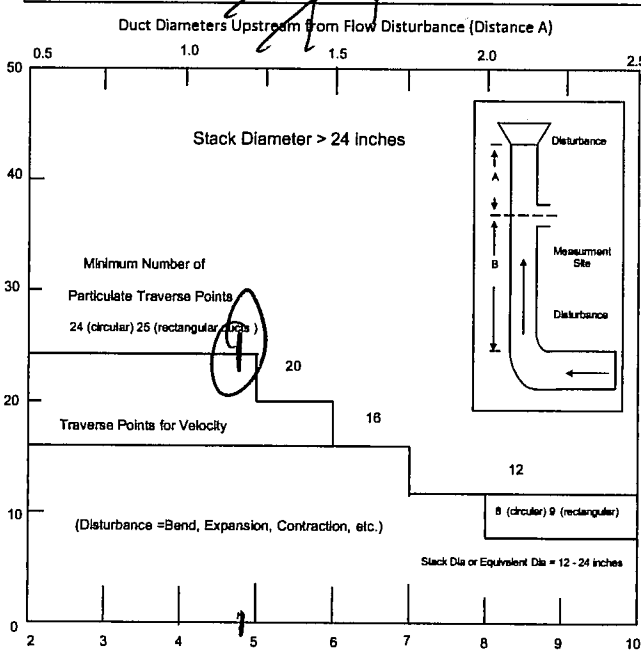
Diagram of Stack



Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	2.1	.63	16
2	6.7	2.0	17
3	11.8	3.5	18 1/2
4	17.7	5.3	20 3/8
5	25	7.5	22 1/2
6	35.6	10.7	25 3/4
7	64.4	19.3	34 3/8
8	75	22.5	37 1/2
9	82.3	24.7	39 3/4
10	88.2	26.5	41 1/2
11	93.3	28.0	43
12	97.9	29.4	44
CEM 3 Point(Long Measurment Line) Stratificaton 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

WESTON

Determination of Stack Gas Velocity - Method 2

Client: Chevron | Operator: KS/MW | Pitot Coeff (Cp): ~~0.84~~ .8
Location/Plant: Fayetteville | Date: 1/08/2018 | Stack Area, ft² (As): 4.90
Source: PPA | W.O. Number: 18[illegible] | Pitot Tube/Thermo ID: P696

Run Number	Pre 1		
Time	1727 - 1740		
Barometric Press, in Hg (Pb)			
Static Press, in H_20 (Pstatic)			
Source Moisture, % (BWS)			
O_2, %			
CO_2, %			

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)
0.07	5	A	1	0.14	65				
0.07	5		2	0.14	65				
0.08	5		3	0.44	67				
0.08	5		4	0.49	68				
0.07	5		5	0.54	69				
0.08	5		6	0.70	70				
0.08	5		7	0.73	70				
0.10	5		8	0.76	70				
0.08	5		9	0.76	71				
0.09	5		10	0.76	71				
0.08	5		11	0.77	71				
0.08	5		12	0.72	71				
-	-	-	-	-	-				
0	0	B	1	0.17	67				
0	0		2	0.17	67				
0	0		3	0.17	67				
0	0		4	0.38	68				
0	0		5	0.51	68				
0	0		6	0.59	69				
0	0		7	0.73	69				
0	0		8	0.79	68				
0	0		9	0.78	70				
0.08	5		10	0.77	70				
0.07	5		11	0.77	70				
0.07	5		12	0.74	70				
Avg Angle		Avg Delta P & Temp		0.5633	69				
		avg $\sqrt{DeltaP}$		0.7273					
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
method2.xls

Sample and Velocity Traverse Point Data Sheet - Method 1

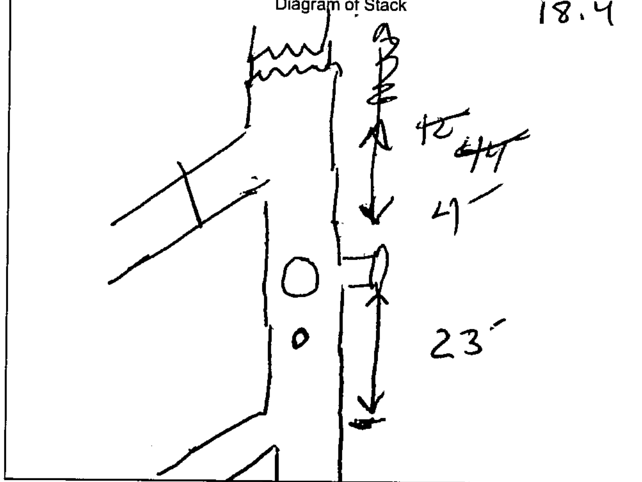
Client: Chemours
Loaction/Plant: Fayetteville, N.C.
Source: PPA Stack - BOLG Air
Operator: MW
Date: 1/08/18
W.O. Number: 15418.[illegible]

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	15
Depth of Duct, diameter (in.) = C-D	30
Area of Duct (ft²)	4.90
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) ---(Flange-Threaded-Hole)	4"
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)	~~44~~ 44
Downstream - B (ft)	12
Upstream - A (duct diameters)	≈ ~~16~~ 3.2
Downstream - B (duct diameters)	≈ 9.2

Diagram of Stack



Traverse Point Locations

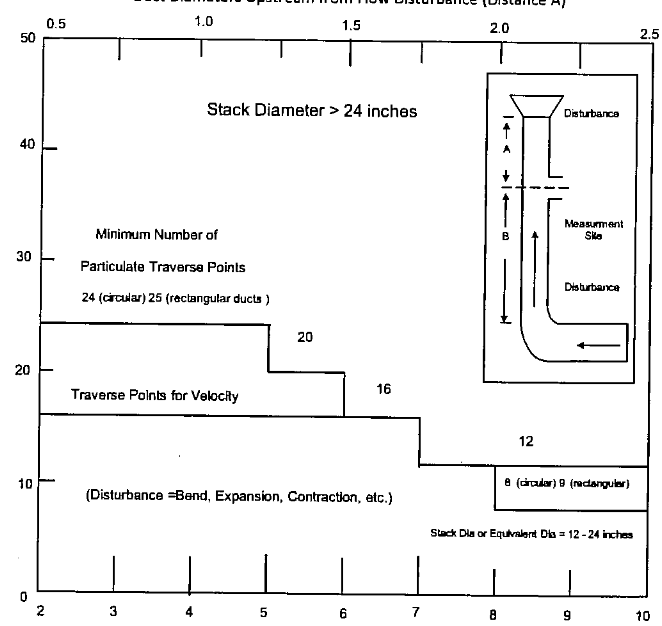
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	2.1	6.3	16
2	6.7	2.0	17
3	11.8	3.5	18.5
4	17.7	5.3	20 3/8
5	25	7.5	22 1/2
6	35.6	10.67	25 3/4
7	64.4	19.3	34 3/8
8	75	22.5	37 1/2
9	82.3	24.7	39 3/4
10	88.2	26.5	41 1/2
11	93.3	28.0	43
12	97.9	29.4	44

CEM 3 Point(Long Measurment Line) Stratificaton 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 Location	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

(Columns: Number of Traverse Points)

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	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

(Columns: Number of Traverse Points)

WESTON

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

Client	The Chemours Company
W.O.#	15418.002.001
Project ID	Chemours
Mode/Source ID	Gas
Samp. Loc. ID	PPA
Run No.ID	1
Test Method ID	M0010
Date ID	22JAN2018
Source/Location	Scrubber Stack
Sample Date	1/24/18
Baro. Press (in Hg)	30.14
Operator	MP

Stack Conditions

	Assumed	Actual
% Moisture	12.0	
Impinger Vol (ml)		15
Silica gel (g)		11.2
CO2, % by Vol	0.1	0.0
O2, % by Vol	20.9	20.9
Temperature (°F)	65	
Meter Temp (°F)	53	
Static Press (in H_2O)	2.8	3.1
Ambient Temp (°F)	55	

Meter Box ID	29		
Meter Box Y	0.9934		
Meter Box Del H	1.9750		
Probe ID / Length	P697	6'	
Probe Material	Boro		
Pitot / Thermocouple ID	P697		
Pitot Coefficient	0.84		
Nozzle ID	G191		
Nozzle Measurements	0.191	0.191	0.191
Avg Nozzle Dia (in)	0.191		
Area of Stack (ft²)	4.90		
Sample Time	96		
Total Traverse Pts	24		

K Factor 1.50

	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.001	0.002
Leak Check @ (in Hg)	15	5	5
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	53	60
Reference Temp	53	61
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 OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	1152			894.640									
A	1	4		0.80	1.20	896.70	68	55	100	100	46	3	49		
	2	8		0.80	1.20	899.12	68	55	100	100	41	3	44		
	3	12		0.82	1.23	901.68	69	56	99	99	40	3	38		
	4	16		0.80	1.20	904.10	69	57	99	99	41	4	40		
	5	20		0.80	1.20	906.43	69	58	98	99	44	4	41		K-FACTOR
	6	24		0.78	1.17	908.82	69	58	99	100	45	4	41	←	1.51
	7	28		0.61	0.92	910.83	70	58	100	100	45	3	40		
	8	32		0.52	0.78	912.75	71	58	99	99	45	3	40		25.21
	9	36		0.52	0.78	914.70	71	58	99	99	45	3	40		
	10	40		0.45	0.68	916.43	70	58	99	100	45	3	40		
	11	44		0.42	0.63	918.14	71	59	99	100	42	2	40		
	12	48	1240	0.42	0.63	919.850	72	60	100	99	41	2	39		
			1300			919.923									
B	1	4		0.75	1.13	922.12	69	62	100	100	49	3	45		25.097
	2	8		0.77	1.16	924.39	69	62	100	100	43	3	42		
	3	12		0.77	1.16	926.45	69	62	100	100	41	3	42		
	4	16		0.78	1.17	928.90	69	62	101	101	41	3	41		
	5	20		0.78	1.17	931.20	69	63	100	101	41	3	42		
	6	24		0.75	1.13	933.69	70	65	100	101	41	3	41		
	7	28		0.65	0.98	935.90	69	66	100	100	43	3	41		
	8	32		0.54	0.82	938.08	70	66	100	100	42	3	43		
	9	36		0.40	0.60	940.26	69	66	101	101	42	3	41		
	10	40		0.38	0.57	941.69	68	67	100	101	44	2	43		
	11	44		0.36	0.54	943.45	66	68	101	100	45	2	43		
	12	48	1348	0.36	0.54	945.020	66	68	101	100	44	2	42		

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
0.62625	0.94125	50.307	~~61.1~~ 69.2	61.1	101	101	49	4	49

Avg Sqrt Delta P	Avg Sqrt Del H	Comments:
0.78333	0.96034	

98/101 99/101

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

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			Assumed	Actual					
Client	The Chemours Company				Meter Box ID	29			
W.O.#	15418.002.001				Meter Box Y	0.9934			
Project ID	Chemours	% Moisture	2		Meter Box Del H	1.9750			
Mode/Source ID	Gas	Impinger Vol (ml)		13	Probe ID / Length	P563	6'	Sample Train (ft³)	
Samp. Loc. ID	PPA	Silica gel (g)		11.9	Probe Material		Boro	Leak Check @ (in Hg)	
Run No.ID	2	CO2, % by Vol	0.1		Pitot / Thermocouple ID	P 563		Pitot leak check good	
Test Method ID	M0010	O2, % by Vol	20.8		Pitot Coefficient		0.84	Pitot Inspection good	
Date ID	22JAN2018	Temperature (°F)	70		Nozzle ID		G191	Method 3 System good	
Source/Location	Scrubber Stack	Meter Temp (°F)	58		Nozzle Measurements	0.191	0.191	0.191	Temp Check
Sample Date	1/24/18	Static Press (in H_2O)	3.1	3.1	Avg Nozzle Dia (in)		0.191		
Baro. Press (in Hg)	30.14				Area of Stack (ft²)		4.90		Meter Box Temp
Operator	MW	Ambient Temp (°F)		59	Sample Time		96		Reference Temp
					Total Traverse Pts		24		Pass/Fail (+/- 2°)
									Temp Change Response ?

K Factor 1.51

	Initial	Mid-Point	Final
	0.001	0.021	0.001
	15	5	as
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
	Pre-Test Set		Post-Test Set
Meter Box Temp	58		70
Reference Temp	58		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 (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	1443			945.895									
B	1	4		0.75	1.13	948.20	70	75	104	101	53	3	45		
	2	8		0.75	1.13	950.53	70	75	102	100	52	3	44		
	3	12		0.78	1.17	952.93	70	75	102	100	51	3	42		
	4	16	1.21	0.78	1.17 1.24	955.31	70	75	98	100	47	3	45	←	K-FACTOR CHANGE
	5	20		0.78	1.21	957.73	70	75	101	102	48	4	45		
	6	24		0.72	1.11	960.02	70	75	99	100	48	4	45		1.55
	7	28		0.65	1.00	962.25	70	75	99	100	48	4	45		
	8	32		0.62	0.96	964.44	70	75	99	101	49	3	45		26.20°
	9	36		0.51	0.79	966.60	69	76	100	100	48	3	44		
	10	40		0.42	0.65	968.55	69	76	97	99	47	3	45		
	11	44		0.40	0.62	970.37	68	76	101	103	46	3	43		
	12	48	1531	0.36	0.55	972.103	68	76	100	100	46	3	43		
			1554			972.140									
A	1	4	1	0.80	1.24	974.46	64	72	101	101	46	4	40		
	2	8		0.80	1.24	976.77	65	72	100	100	45	4	40		
	3	12		0.78	1.17	979.06	65	74	100	100	42	3	41	←	K-FACTOR CHANGE
	4	16		0.80	1.20	981.40	65	74	102	100	42	4	41		1.51
	5	20		0.78	1.17	983.68	65	74	98	100	43	3	42		
	6	24		0.74	1.11	985.97	66	74	100	100	43	3	40		
	7	28		0.60	0.90	988.00	67	73	102	101	43	3	39		
	8	32		0.55	0.83	990.00	68	73	98	100	43	3	39		24.63
	9	36		0.44	0.67	991.81	68	73	102	100	43	3	39		
	10	40		0.38	0.57	993.57	67	73	99	102	43	3	40		
	11	44		0.36	0.54	995.20	67	73	100	100	43	3	40		
	12	48	1642	0.36	0.54	996.770	67	73	101	98	42	3	40		
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				0.62125	0.94583	53.	67.8	74.3	104	103	53	4			
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				0.78017	0.96255	50.838									

97/104 98/103

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

Client	The Chemours Company
W.O.#	15418.002.001
Project ID	Chemours
Mode/Source ID	Gas
Samp. Loc. ID	PPA
Run No.ID	3
Test Method ID	M0010
Date ID	22JAN2018
Source/Location	Scrubber Stack
Sample Date	1/25/18
Baro. Press (in Hg)	30.42
Operator	MW Matt Winkeler

Stack Conditions

	Assumed	Actual
% Moisture	1	
Impinger Vol (ml)		10.0
Silica gel (g)		10.3
CO2, % by Vol	0.0	
O2, % by Vol	20.9	
Temperature (°F)	65	
Meter Temp (°F)	32	
Static Press (in H_2O)	3.1	3.0
Ambient Temp (°F)	33	

Meter Box ID	29		
Meter Box Y	0.9934		
Meter Box Del H	1.9750		
Probe ID / Length	P563	6'	
Probe Material	(Boro)		
Pitot / Thermocouple ID	P563		
Pitot Coefficient	(0.84)		
Nozzle ID	0.191		
Nozzle Measurements	0.191	0.191	0.191
Avg Nozzle Dia (in)	0.191		
Area of Stack (ft²)	4.90		
Sample Time	~~24~~ 96 MW 3/8/18		
Total Traverse Pts	~~96~~ 24 MW 3/8/18		

K Factor	1.46	

	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.001	0.001
Leak Check @ (in Hg)	15	5	5
Pitot leak check good	(yes) / no	(yes) / no	(yes) / no
Pitot Inspection good	(yes) / no	(yes) / no	(yes) / no
Method 3 System good	(yes) / no	(yes) / no	(yes) / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	33	46
Reference Temp	33	46
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 OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	0900			999.000									
B	1	4		0.77	1.12	1001.13	65	37	103	100	36	4	35		
	2	8		0.75	1.09	1003.28	64	38	96	99	35	4	36		23.070
	3	12		0.75	1.09	1005.40	64	38	101	100	35	4	35		
	4	16		0.75	1.09	1007.58	64	39	95	99	36	4	36		
	5	20		0.76	1.10	1009.75	64	39	101	100	36	~~4~~ 4	36		
	6	24	MW 3/8/2018	0.76	1.10	1011.92	64	40	96	100	37	4	36		
	7	28		0.65	0.95	1014.04	64	40	101	101	38	3	36		
	8	32		0.55	0.80	1016.00	64	41	94	99	38	3	37		
	9	36		0.42	0.61	1017.61	62	41	103	100	38	3	36		
	10	40		0.36	0.52	1019.15	61	42	98	97	38	3	38		
	11	44		0.32	0.46	1020.61	60	42	103	100	38	3	36		
	12	48	0948	0.32	0.46	1022.010	59	42	98	100	38	3	37		
			1012			22.150									
A	1	4		0.78	1.13	24.30	64	46	102	100	41	3	39		
	2	8		0.79	1.17	26.61	64	46	97	99	37	4	37	←	K-Factor 1.50
	3	12		0.78	1.17	28.70	64	46	101	99	37	4	37		
	4	16		0.80	1.20	31.10	65	47	98	100	37	4	37		
	5	20		0.80	1.20	33.40	65	47	100	102	37	4	37		
	6	24		0.75	1.12	35.69	66	48	100	102	39	4	39		
	7	28		0.65	0.97	37.73	66	48	100	102	39	3	39		
	8	32		0.54	0.81	39.67	67	48	100	102	39	3	39		
	9	36		0.45	0.67	41.42	67	48	98	100	41	3	40		
	10	40		0.45	0.67	43.18	67	48	103	98	40	3	40		24.065
	11	44		0.34	0.51	44.70	67	48	94	100	41	3	41		
	12	48	1100	0.32	0.48	46.215	67	48	98	100	41	3	41		

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
0.6083 ✓	0.89542	47.135 ✓	64.3 ✓	43.6 ✓	94/103	98/102	41	4	41
Avg Sqrt Delta P	Avg Sqrt Del H								
0.77809 ✓	0.93417								

Comments: Monitored meter ~~console~~ turn over console MW 1/25/18

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

SRV

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client: The Chemours Company | W.O. #: 15418.002.001
Location/Plant: Fayetteville, NC | Source & Loaction: Scrubber Stack

Run No. ___ | Sample Date 1/24/18 | Recovery Date 1/24/18
Sample I.D. Chemours - Gas - PPA - 1 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	3	100	100	12					312	
Initial	0	100	100	0					300	
Gain	3	0	0	12				15	12	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Run No. ___ | Sample Date 1/24/18 | Recovery Date 1/24/18
Sample I.D. Chemours - Gas - PPA - 2 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	2	96	110	5					311.9	
Initial	0	100	100	0					300	
Gain	2	-4	10	5				13	11.9	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Run No. ___ | Sample Date 1/25/18 | Recovery Date 1/25/18
Sample I.D. Chemours - Gas - PPA - 3 - M0010 - | Analyst PMM | Filter Number NA.

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	2	102	103	3					310.3	
Initial	0	100	100	0					300	
Gain	2	2	3	3				10	10.3	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Check COC for Sample IDs of Media Blanks

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

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		Stack Conditions	Assumed	Actual
Client	The Chemours Company			
W.O.#	15418.002.001			
Project ID	Chemours	% Moisture	1	
Mode/Source ID	Gas	Impinger Vol (ml)		9
Samp. Loc. ID	PPA PM4	Silica gel (g)		9.4
Run No.ID	4	CO2, % by Vol	0.0	
Test Method ID	M0010	O2, % by Vol	20.9	
Date ID	22JAN2018	Temperature (°F)	≈ 65	
Source/Location	Scrubber Stack	Meter Temp (°F)	49	
Sample Date	1/25/18	Static Press (in H_2O)	3.0	3.0
Baro. Press (in Hg)	30.47			
Operator	MW/KS	Ambient Temp (°F)	50	

Meter Box ID	29			
Meter Box Y	0.9934			
Meter Box Del H	1.9750			
Probe ID / Length	P 563		Sample Train (ft^3)	
Probe Material			Leak Check @ (in Hg)	Boro
Pitot / Thermocouple ID	P 563		Pitot leak check good	yes / no
Pitot Coefficient	0.84		Pitot Inspection good	yes / no
Nozzle ID	G191		Method 3 System good	yes / no
Nozzle Measurements	0.191	0.191	0.191	Temp Check
Avg Nozzle Dia (in)	0.191			Meter Box Temp
Area of Stack (ft^2)	4.90			Reference Temp
Sample Time	96			Pass/Fail (+/- 2°)
Total Traverse Pts	24			Temp Change Response ?

K Factor 1.51

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.002		0.001
Leak Check @ (in Hg)	c15		c5
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	49		50
Reference Temp	49		50
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 OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1252			46,695									
12	4		0.45	0.67	48.550	67	50	100	100	48	3	44		
11	8		0.44	0.66	50.49	67	50	99	99	47	3	44		
10	12		0.44	0.66	52.21	67	50	101	99	46	3	40		
9	16		0.45	0.67	53.87	67	50	100	101	44	3	39		
8	20		0.46	0.69	55.95	67	51	100	103	44	3	40		
7	24		0.46	0.69	57.50	67	51	98	99	40	3	36		
6	28		0.40	0.60	59.10	67	51	100	96	43	3	40		
5	32		0.38	0.57	60.81	67	51	100	100	43	3	40		
4	36		0.38	0.57	62.52	65	51	100	101	44	3	40		
3	40		0.30	0.45	64.03	63	52	100	100	43	2	40		
2	44		0.30	0.45	65.44	62	51	100	99	43	2	40		
1	48	1340	0.30	0.45	66.85	62	52	100	101	43	2	40		
		1340												40.424
1	4		0.30	0.45	68.45	62	52	100	99	43	2	41		
2	8		0.30	0.45	69.86	62	53	100	100	44	2	40		
3	12		0.30	0.45	71.36	62	53	100	100	43	2	41		
4	16		0.38	0.57	72.94	64	52	100	96	43	3	41		
5	20		0.38	0.57	74.58	64	52	100	96	43	3	41		
6	24		0.36	0.54	76.17	67	52	100	98	43	3	40		
7	28		0.51	0.77	78.06	67	52	100	96	43	3	41		
8	32		0.51	0.77	80.08	68	52	100	103	43	3	41		
9	36		0.46	0.69	81.78	68	53	100	103	43	3	39		
10	40		0.44	0.67	83.54	68	53	100	103	44	3	40		
11	44		0.44	0.66	85.32	68	54	100	101	44	3	40		
12	48	1428	0.45	0.67	87.119	68	54	100	101	44	3	40		
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			0.39958	0.59910	40.424	65.7	51.8	101	103	48	3			
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:			98/101	96/103					
			0.62972	0.77110										

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EPA Method 0010 from EPA SW-846

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client: The Chemours Company | W.O. #: 15418.002.001

Location/Plant: Fayetteville, NC | Source & Location: Scrubber Stack

Run No. 4 | Sample Date 1/25/18 | Recovery Date 1/26/18

Sample I.D. Chemours - Gas - PPA - 1 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty					Silica Gel	
Final	2	97	108	2					308.4	
Initial	0	100	100	0					300	
Gain	2	-3	8	2				9	8.4	

Impinger Color: Clear | Labeled? ✓

Silica Gel Condition: Good | Sealed? ✓

Run No. 2 | Sample Date | Recovery Date

Sample I.D. Chemours - Gas - PPA - 2 - M0010 - | Analyst | Filter Number

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

Impinger Color | Labeled?

Silica Gel Condition | Sealed?

Run No. 3 | Sample Date | Recovery Date

Sample I.D. Chemours - Gas - PPA - 3 - M0010 - | Analyst | Filter Number

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

Impinger Color | Labeled?

Silica Gel Condition | Sealed?

Check COC for Sample IDs of Media Blanks

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR DIMER ACID CALCULATIONS

Test Data			
Run number	1	2	3
Location	Division	Division	Division
Date	1/22/2018	1/23/2018	1/23/2018
Time period	1607-1807	1017-1208	1437-1628
Operator	MW	MW	MW
Inputs For Calcs.			
Sq. rt. delta P	1.11258	1.13675	1.14779
Delta H	0.7036	0.7347	1.4917
Stack temp. (deg.F)	87.5	92.8	95.0
Meter temp. (deg.F)	67.0	71.5	73.8
Sample volume (act.)	42.352	42.531	58.662
Barometric press. (in.Hg)	30.19	29.78	29.72
Volume H_2O imp. (ml)	17.0	16.0	12.0
Weight change sil. gel (g)	11.4	17.1	21.0
% 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)	-0.64	-0.64	-0.64
Nozzle dia. (in.)	0.151	0.151	0.180
Meter box cal.	0.9542	0.9934	0.9934
Cp of pitot tube	0.84	0.84	0.84
Traverse points	12	12	12

Sample and Velocity Traverse Point Data Sheet - Method 1

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

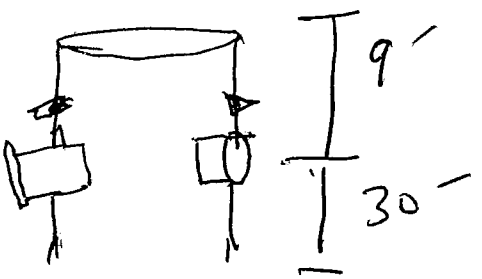
Operator MW/KS
Date 1/22/18
W.O. Number 10418.002.002

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	13 1/4
Depth of Duct, diameter (in.) = C-D	3-0
Area of Duct (ft²) 3/07/18 MW	7.07 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)	2
Downstream - B (duct diameters)	8

Diagram of Stack



Traverse Point Locations

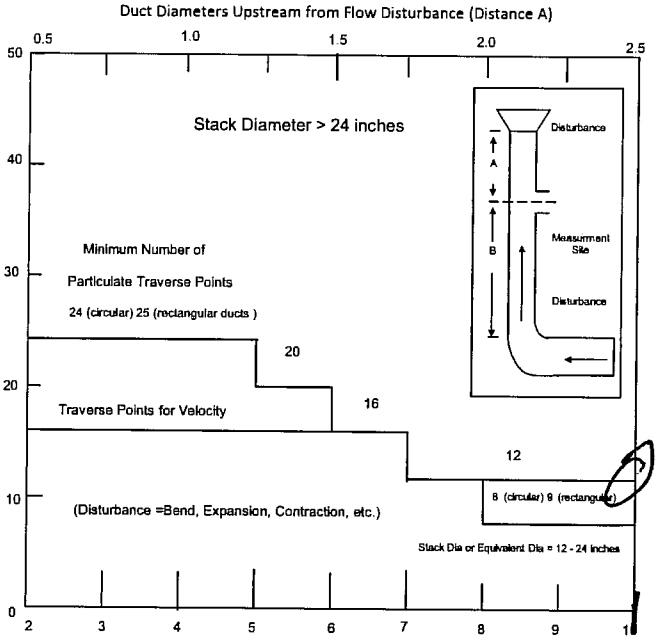
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	4.4	1.62	19 3/8 20 5/8
2	14.6	5.40	23 1/4 24 3/8
3	29.6	10.95	28 7/8 29 7/8
4	70.4	26.04	44.0 45
5	85.4	31.59	49 3/8 50 5/8
6	95.6	35.37	53 1/4 54 3/8
7			
8			
9			
10			
11			
12			

CEM 3 Point(Long Measurment Line) Stratificaton 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

Determination of Stack Gas Velocity - Method 2

Client: Chemours
Location/Plant: Fayetteville, NC
Source: Division Stack
Operator: MW / KS
Date: 1/22/18
W.O. Number: 15418.002.004
Pitot Coeff (Cp): 0.84
Stack Area, ft^2 (As): ~~7.46~~ 7.0 MW 3/08/20
Pitot Tube/Thermo ID: P645

Run Number	1		
Time	1450-1520		
Barometric Press, in Hg (Pb)	30.19		
Static Press, in H_2O (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 $\sqrt{DeltaP}$	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 SOLUTIONS

Comments ____________________

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

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		Stack Conditions	Assumed	Actual
Client	The Chemours Company			
W.O.#	15418.002.001			
Project ID	Chemours	% Moisture	1.8	
Mode/Source ID	Gas	Impinger Vol (ml)		
Samp. Loc. ID	Division	Silica gel (g)		
Run No.ID	1	CO2, % by Vol	0.1	
Test Method ID	M0010	O2, % by Vol	20.9	
Date ID	22JAN2018	Temperature (°F)	83	
Source/Location	Scrubber Stack	Meter Temp (°F)	65	
Sample Date	1/22/18	Static Press (in H_2O)	-0.64	-0.64
Baro. Press (in Hg)	30.19			
Operator	MB	Ambient Temp (°F)	66	

				Sample Train (ft³)	Initial	Mid-Point	Final
Meter Box ID	25						
Meter Box Y	1.0045						
Meter Box Del H	1.9138						
Probe ID / Length	P695	6'			0.002	0.001	0.001
Probe Material	Boro			Leak Check @ (in Hg)	11	5	5
Pitot / Thermocouple ID	P695			Pitot leak check good	yes / no	yes / no	yes / no
Pitot Coefficient	0.84			Pitot Inspection good	yes / no	yes / no	yes / no
Nozzle ID	G151			Method 3 System good	yes / no	yes / no	yes / no
Nozzle Measurements	0.151	0.151	0.151	**Temp Check**	Pre-Test Set		Post-Test Set
Avg Nozzle Dia (in)	0.151			Meter Box Temp	65		63
Area of Stack (ft²)	MB 7.466		7.07	Reference Temp	65		63
Sample TIme	3/08/2018 90			Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Total Traverse Pts	12			Temp Change Response ?	yes / no		yes / no

K Factor 0.569

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 OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1607			63.530									
A 1	7.5		1.2	0.682	66.92	86	69	100	100	58	4	47		
2	15.0		1.4	0.796	70.75	88	69	100	103	53	4	47		
3	22.5		1.5	0.853	74.70	88	69	100	100	52	4	46		
4	30.0		1.3	0.739	78.40	88	69	96	100	52	4	50		
5	37.5		1.2	0.682	81.90	88	68	96	98	52	4	49		
6	45.0	1652	1.1	0.625	85.350	87	68	96	100	51	4	43		
					85.845	2	68							
		1722	+											
B 1	7.5		1.1	0.625	88.70	86	66	104	101	54	3	50		
2	15.0		1.2	0.682	92.30	87	66	100	101	50	4	48		
3	22.5		1.3	0.739	95.88	88	66	100	98	50	4	50		
4	30.0		1.4	0.769	99.75	88	65	100	100	49	4	49		
5	37.5		1.2	0.682	103.14	88	64	100	99	49	3	49		
6	45.0	1807	1.0	0.569	106.377	88	65	100	100	50	3	50		
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			1.24166	0.70358	42.847	87.5	67.0	104	101	58	4	50		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments: 60									
			1.11257	0.83756	42.352			96/104	98/101					

EPA Method 0010 from EPA SW-846

21.032
21.815

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

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		Stack Conditions	Assumed	Actual
Client	The Chemours Company	% Moisture	2.5	
W.O.#	15418.002.001	Impinger Vol (ml)		
Project ID	Chemours	Silica gel (g)		
Mode/Source ID	Gas	CO2, % by Vol	0.0	
Samp. Loc. ID	Division	O2, % by Vol	20.8	
Run No.ID	2	Temperature (°F)	85	
Test Method ID	M0010	Meter Temp (°F)	67 ~~85~~	
Date ID	22JAN2018	Static Press (in H_2O)	-0.64	-0.64
Source/Location	Scrubber Stack			
Sample Date	1/23/18			
Baro. Press (in Hg)	29.78	Ambient Temp (°F)	67	
Operator	MD			

Meter Box ID	29		
Meter Box Y	0.9934		
Meter Box Del H	1.9750		
Probe ID / Length	P695		Sample Train (ft^3)
Probe Material	Boro		Leak Check @ (in Hg)
Pitot / Thermocouple ID	P695		Pitot leak check good
Pitot Coefficient	0.84		Pitot Inspection good
Nozzle ID	GT51		Method 3 System good
Nozzle Measurements	0.151	0.151 / 0.151	**Temp Check**
Avg Nozzle Dia (in)	0.151		Meter Box Temp
Area of Stack (ft^2)	7.07		Reference Temp
Sample Time	90		Pass/Fail (+/- 2°)
Total Traverse Pts	12		Temp Change Response ?

K Factor 0.567

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.001	0.001	0.001
Leak Check @ (in Hg)	15	@ 5	5
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	67		73
Reference Temp	67		73
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 OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1017			787.515									
A 1	7.5		1.2	0.680	790.75	92	70	102	105	67	3	58		
2	15.0		~~1.6~~ 1.6	0.907	794.81	92	70	100	102	63	4	56		
3	22.5		1.6	0.907	798.70	92	71	100	102	64	4	61		
4	30.0		1.41	0.793	802.50	94	72	100	98	60	4	58		21.646
5	37.5		1.3	0.737	806.03	93	72	100	101	58	4	54		
6	45.0	1102	1.0	0.567	809.161	93	72	100	98	57	3	51		
		1123			809.240									
B 1	7.5		1.1	0.623	812.50	91	71	100	100	61	3	53		
2	15.0		1.2	0.675	815.93	92	72	100	100	58	3	51	←	K-FACTOR CHANG 0.563
3	22.5		1.5	0.845	819.79	93	72	100	102	58	4	51		
4	30.0		1.4	0.788	823.40	94	72	100	97	57	4	50		
5	37.5		1.3	0.731	826.91	94	72	100	101	57	4	50		
6	45.0	1208	1.0	0.563	830.125	94	72	100	101	57	3	51		
														20.805

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
1.30000	~~0.73467~~	42.531	92.8	71.5	102	105	67	4	61
Avg Sqrt Delta P	Avg Sqrt Del H	Comments:							
1.13675	~~0.85725~~								

0.73467
0.85454

100/102 91/105

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET

EPA Method 0010

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Field	Value
Client	The Chemours Company
W.O.#	15418.002.001
Project ID	Chemours
Mode/Source ID	Gas
Samp. Loc. ID	Division
Run No.ID	3
Test Method ID	M0010
Date ID	22JAN2018
Source/Location	Scrubber Stack
Sample Date	1/23/18
Baro. Press (in Hg)	29.72
Operator	MZ

Stack Conditions

	Assumed	Actual
% Moisture	3.0	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0.1	
O2, % by Vol	20.9	
Temperature (°F)	93	
Meter Temp (°F)	74	
Static Press (in H_2O)	-0.64	-0.64
Ambient Temp (°F)	67	

Field	Value		
Meter Box ID	29		
Meter Box Y	0.9934		
Meter Box Del H	1.9750		
Probe ID / Length	P695		
Probe Material	Boro		
Pitot / Thermocouple ID	P695		
Pitot Coefficient	0.84		
Nozzle ID	G180		
Nozzle Measurements	.180	.180	.180
Avg Nozzle Dia (in)	0.180		
Area of Stack (ft²)	~~7.466~~ 7.07 (MZ 3/08/18)		
Sample Time	90		
Total Traverse Pts	12		

K Factor 1.13

	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.001	0.002
Leak Check @ (in Hg)	@15	@8	@8
Pitot leak check good	yes	yes	yes
Pitot Inspection good	yes	yes	yes
Method 3 System good	yes	yes	yes

Temp Check

	Pre-Test Set	Post-Test Set
Meter Box Temp	73	73
Reference Temp	73	73
Pass/Fail (+/- 2°)	Pass	Pass
Temp Change Response ?	yes	yes

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 OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1437			831.450									
A 1	7.5		~~1.2~~ 1.2	1.35	835.70	92	75	100	100	67	5	55		
2	15.0		1.2	1.35	840.51	95	74	100	101	59	5	50		28.56
3	22.5		1.6	1.80	845.83	95	74	100	100	59	7	50		
4	30.0		1.4	1.58	851.03	95	74	100	101	61	7	51		
5	37.5		1.2	1.35	855.95	96	74	100	101	61	6	52		
6	~~30.0~~ 45.0	1522	1.1	1.24	860.013	95	74	100	102	63	5	59		
		1543			860.451									
B 1	7.5		1.3	1.46	865.23	94	73	100	100	62	6	51		
2	15.0		1.5	1.69	870.56	95	74	100	98	60	6	52		30.09
3	22.5		1.6	1.80	876.17	95	73	100	99	60	7	50		
4	30.0		1.6	1.80	881.65	96	74	100	99	61	7	51		
5	37.5		1.2	1.35	886.34	96	74	100	98	62	6	52		
6	45.0	1628	1.0	1.13	890.550	96	73	100	102	64	5	52		

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
1.32500	1.49166	58.662	95.0	~~95.0~~ 73.8	100/100	98/102	67	7	59

Avg Sqrt Delta P	Avg Sqrt Del H
1.14778	1.21786

Comments:

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client: The Chemours Company | W.O. #: 15418.002.001
Location/Plant: Fayetteville, NC | Source & Location: Scrubber Stack

Run No. 1 | Sample Date 1/22/18 | Recovery Date 1/22/18
Sample I.D. Chemours - Gas - Division - 1 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty					Silica Gel	
Final	2	104	106	5					311.4	
Initial	0	100	100	0					300	
Gain	2	4	6	5				17.0	11.4	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Run No. 2 | Sample Date 1/23/18 | Recovery Date 1/23/18
Sample I.D. Chemours - Gas - Division - 2 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty					Silica Gel	
Final	10	102	96	8					317.4	
Initial	0	100	100	0					300	
Gain	10	2	-4	8				16	17.1	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Run No. 3 | Sample Date 1/23/18 | Recovery Date 1/23/18
Sample I.D. Chemours - Gas - Division - 3 - M0010 - | Analyst PMM | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty					Silica Gel	
Final	2	97	107	6					321.0	
Initial	0	100	100	0					300	
Gain	2	-3	7	6				12	21.0	

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: Good | Sealed? ✓

Check COC for Sample IDs of Media Blanks

METHODS AND ANALYZERS

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

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

File: C:\DATA\Chemours\fayetteville\012218 division run1.cem
Program Version: 2.0, built 21 Feb 2015 **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, %	**16.8**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

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

Start Time: 14:11

O_2

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

Calibration Standards

%	**Cylinder ID**
12.0	CC62094
21.0	CC349225

Calibration Results

Zero	11 mv
Span, 21.0 %	8026 mv

Curve Coefficients

Slope	**Intercept**
381.5	11

CO_2

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

Calibration Standards

%	**Cylinder ID**
8.9	CC62094
16.8	CC349225

Calibration Results

Zero	-1 mv
Span, 16.8 %	8383 mv

Curve Coefficients

Slope	**Intercept**
500.5	-1

CALIBRATION ERROR DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

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

Start Time: 14:11

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 381.5 **Intercept** 11.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.1	0.1	0.5	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %
Slope 500.5 **Intercept** -1.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.9	0.0	0.0	Pass
16.8	16.8	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **22 Jan 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	0.2	0.2	1.0	Pass
Span	12.1	12.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

RUN SUMMARY

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

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

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

Time: 16:07 to 18:07

Run Averages

	20.7	0.0

Pre-run Bias at 14:15

Zero Bias	0.2	0.1
Span Bias	12.1	8.8
Span Gas	12.0	8.9

Post-run Bias at 19:05

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

Averages corrected for the average of the pre-run and post-run bias

	20.8	0.0

Use ambient air 20.9 0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** Project Number:
Location: **Fayetteville, NC** Operator: **SR**
Source: **Division** Calibration **1** Date: **22 Jan 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	12.1	11.9	-0.2	-1.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.2	0.0	-0.2	-1.0	Pass
Span	12.1	11.9	-0.2	-1.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.6	Pass
Span	8.8	8.9	0.1	0.6	Pass

*Bias No. 1

METHODS AND ANALYZERS

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

File: C:\DATA\Chemours\fayetteville\012318 division run23.cem
Program Version: 2.0, built 21 Feb 2015 **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, %	**16.8**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

Start Time: 07:51

O_2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC62094
21.0	CC349225

Calibration Results

Zero	1 mv
Span, 21.0 %	8005 mv

Curve Coefficients

Slope	**Intercept**
381.0	1

CO_2

Method: EPA 3A

Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC62094
16.8	CC349225

Calibration Results

Zero	4 mv
Span, 16.8 %	8386 mv

Curve Coefficients

Slope	**Intercept**
500.4	4

CALIBRATION ERROR DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

Start Time: 07:51

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 381.0 **Intercept** 1.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.1	0.1	0.5	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %
Slope 500.4 **Intercept** 4.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.8	-0.1	-0.6	Pass
16.8	16.8	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

Start Time: 08:02

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	12.1	12.0	-0.1	-0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.8	8.7	-0.1	-0.6	Pass

RUN SUMMARY

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

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

Time: 10:17 to 12:08

Run Averages

	20.8	0.0

Pre-run Bias at 08:02

Zero Bias	0.0	0.0
Span Bias	12.0	8.7
Span Gas	12.0	8.9

Post-run Bias at 12:53

Zero Bias	0.0	0.0
Span Bias	11.8	8.5
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

	21.0	0.0
Use Ambient Air	20.9	0.0

WESTON SOLUTIONS

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

Start Time: 12:53

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	12.1	11.8	-0.3	-1.4	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.8	-0.2	-1.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.8	8.5	-0.3	-1.8	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.7	8.5	-0.2	-1.2	Pass

*Bias No. 1

RUN SUMMARY

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

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

Time: 14:36 to 16:28

Run Averages

	20.8	0.1

Pre-run Bias at 12:53

Zero Bias	0.0	0.0
Span Bias	11.8	8.5
Span Gas	12.0	8.9

Post-run Bias at 17:34

Zero Bias	0.0	0.0
Span Bias	11.9	8.6
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

	21.1	0.1

use Ambient Air 20.9 0.0

WESTON SOLUTIONS SM

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **Division**

Calibration **1**

Project Number:
Operator: **SR**
Date: **23 Jan 2018**

Start Time: 17:34

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	12.1	11.9	-0.2	-1.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.8	11.9	0.1	0.5	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.8	8.6	-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	8.6	0.1	0.6	Pass

*Bias No. 2

WESTON SOLUTIONS

METHODS AND ANALYZERS

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

File: C:\DATA\Chemours\fayetteville\012418 ppa 5.cem
Program Version: 2.0, built 21 Feb 2015 **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, %	**16.8**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

Start Time: 15:22

O_2

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

Calibration Standards

%	**Cylinder ID**
12.0	CC62094
21.0	CC349225

Calibration Results

Zero	5 mv
Span, 21.0 %	8013 mv

Curve Coefficients

Slope	**Intercept**
381.2	5

CO_2

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

Calibration Standards

%	**Cylinder ID**
8.9	CC62094
16.8	CC349225

Calibration Results

Zero	5 mv
Span, 16.8 %	8389 mv

Curve Coefficients

Slope	**Intercept**
500.5	5

CALIBRATION ERROR DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

Start Time: 15:22

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 381.2 **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. 16.8 %
Slope 500.5 **Intercept** 5.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.7	-0.2	-1.2	Pass
16.8	16.8	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

Start Time: 15:27

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	12.1	0.1	0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.7	8.8	0.1	0.6	Pass

RUN SUMMARY

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

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

Time: 15:32 to 17:00

Run Averages

	20.9	0.0

Pre-run Bias at 15:27

Zero Bias	0.0	0.1
Span Bias	12.1	8.8
Span Gas	12.0	8.9

Post-run Bias at 17:02

Zero Bias	0.1	0.0
Span Bias	12.0	8.7
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

	20.8	0.0
Use Ambient Air	20.9	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **24 Jan 2018**

Start Time: 17:02

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

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.7	8.7	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.6	Pass
Span	8.8	8.7	-0.1	-0.6	Pass

*Bias No. 1

METHODS AND ANALYZERS

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

File: C:\DATA\Chemours\fayetteville\012518 ppa run 3 room.cem
Program Version: 2.0, built 21 Feb 2015 **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, %	**16.8**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

Start Time: 07:48

O_2

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

Calibration Standards

%	**Cylinder ID**
12.0	CC62094
21.0	CC349225

Calibration Results

Zero	17 mv
Span, 21.0 %	8019 mv

Curve Coefficients

Slope	**Intercept**
380.9	17

CO_2

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

Calibration Standards

%	**Cylinder ID**
8.9	CC62094
16.8	CC349225

Calibration Results

Zero	-1 mv
Span, 16.8 %	8388 mv

Curve Coefficients

Slope	**Intercept**
500.8	-1

CALIBRATION ERROR DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

Start Time: 07:48

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.9 **Intercept** 17.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.1	0.1	0.5	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %
Slope 500.8 **Intercept** -1.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.9	0.0	0.0	Pass
16.8	16.8	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

Start Time: 07:55

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	12.1	12.0	-0.1	-0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

RUN SUMMARY

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

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

Time: 08:59 to 11:00

Run Averages

	21.0	0.0

Pre-run Bias at 07:55

Zero Bias	0.0	0.1
Span Bias	12.0	8.8
Span Gas	12.0	8.9

Post-run Bias at 11:01

Zero Bias	0.0	0.1
Span Bias	12.0	8.7
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

	21.0	0.0
use ambient air	20.9	0.0

WESTON SOLUTIONS

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **PPA** | Calibration **1** | Date: **25 Jan 2018**

Start Time: 11:01

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	12.1	12.0	-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	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.7	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.8	8.7	-0.1	-0.6	Pass

*Bias No. 1

RUN SUMMARY

Number 4

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **PPA**

Calibration **1**

Project Number:
Operator: **SR**
Date: **25 Jan 2018**

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

Time: 12:51 to 14:28

Run Averages

	21.0	0.0

Pre-run Bias at 11:01

Zero Bias	0.0	0.1
Span Bias	12.0	8.7
Span Gas	12.0	8.9

Post-run Bias at 14:42

Zero Bias	0.0	0.1
Span Bias	12.0	8.7
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

	21.0	0.0
Use Ambient Air	20.9	0.0

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours** | Project Number:
Location: **Fayetteville, NC** | Operator: **SR**
Source: **PPA** | Calibration **1** | Date: **25 Jan 2018**

Start Time: 14:42

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	12.1	12.0	-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	12.0	0.0	0.0	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.8 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.7	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.7	8.7	0.0	0.0	Pass

*Bias No. 2

WESTON SOLUTIONS

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: 140-10529-1

Job Description: Division Stack Emissions Test

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
2/20/2018 10:19 AM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
02/20/2018

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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: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

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: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-10529-1	Q-1601,1602 M0010 RUN 1 FH	Air	01/22/18 00:00	01/23/18 11:00
140-10529-2	Q-1603,1604,1606 M0010 RUN 1 BH	Air	01/22/18 00:00	01/24/18 17:25
140-10529-3	Q-1605 M0010 RUN 1 COND	Air	01/22/18 00:00	01/24/18 17:25
140-10529-4	Q-1607 M0010 RUN 1 XAD-2	Air	01/22/18 00:00	01/24/18 17:25
140-10529-5	Q-1608,1609 M0010 RUN 2 FH	Air	01/23/18 00:00	01/24/18 17:25
140-10529-6	Q-1610,1611,1613 M0010 RUN 2 BH	Air	01/23/18 00:00	01/24/18 17:25
140-10529-7	Q-1612 M0010 RUN 2 COND	Air	01/23/18 00:00	01/24/18 17:25
140-10529-8	Q-1614 M0010 RUN 2 XAD-2	Air	01/23/18 00:00	01/24/18 17:25
140-10529-9	Q-1615,1616 M0010 RUN 3 FH	Air	01/23/18 00:00	01/24/18 17:25
140-10529-10	Q-1617,1618,1620 M0010 RUN 3 BH	Air	01/23/18 00:00	01/24/18 17:25
140-10529-11	Q-1619 M0010 RUN 3 COND	Air	01/23/18 00:00	01/24/18 17:25
140-10529-12	Q-1621 M0010 RUN 3 XAD-2	Air	01/23/18 00:00	01/24/18 17:25
140-10529-14	Q-1622,1623 M0010 RUN QC FH BT	Air	01/23/18 00:00	01/24/18 17:25
140-10529-15	Q-1624,1625.1627 M0010 RUN QC BH BT	Air	01/23/18 00:00	01/24/18 17:25
140-10529-16	Q-1626 M0010 RUN QC COND BT	Air	01/23/18 00:00	01/24/18 17:25
140-10529-17	Q-1628 M0010 RUN QC XAD-2 BT	Air	01/23/18 00:00	01/24/18 17:25
140-10529-18	Q-1629 M0010 QC DI WATER RB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-19	Q-1630 M0010 QC MEOH WITH 5% NH4OH RB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-20	Q-1631 M0010 QC XAD-2 RESIN TUBE RB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-21	Q-1632 M0010 QC METHANOL TB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-22	Q-1633 M0010 QC XAD-2 RESIN TUBE TB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-23	Q-1635 M0010 QC FH FILTER HOLDER & PROBE MEOH 55 NH4OH RINSE PB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-24	Q-1637 M0010 QC BH FILTER HOLDER & COIL COND MEOH 5% NH4OH RINSE PB	Air	01/23/18 00:00	01/24/18 17:25
140-10529-25	Q-1639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RINSE PB	Air	01/23/18 00:00	01/24/18 17:25

Job Narrative
140-10529-1

Sample Receipt

The samples were received on January 24, 2018 at 5:25 PM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 0.2º C and 0.3º 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

Samples associated with this analytical batch were originally analyzed with an "E" flag to indicate that the HFPO-DA exceeded the calibration curve of the method. Project specific calculations are provided as an addendum to this narrative.

Organic Prep

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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.

Chemours Division Stack Emissions Test Analytical Report
TestAmerica Job No. 140-10529-1
February 9, 2018

The following samples exceeded the Method 8321A calibration range for HFPO-DA and required that dilution of the extracts be performed:

- Q-1601, Q-1602 (Division Stack) Run #1 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- Q-1603, Q-1604 and Q-1606 (Division Stack) Run #1 Back-Half Composite (XAD-2 Resin and Glassware Rinses)
- Q-1608, Q-1609 (Division Stack) Run #2 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- Q-1610, Q-1611 and Q-1613 (Division Stack) Run #2 Back-Half Composite (XAD-2 Resin and Glassware Rinses)
- Q-1615, Q-1616 (Division Stack) Run #3 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- Q-1617, Q-1618 and Q-1620 (Division Stack) Run #3 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

The original analysis concentration which displays the “E” flag is provided with the data set indicating that the value provided is estimated. The $^{13}C_3$ – HFPO-DA isotope dilution internal standard (IDA) recovery percentage (%) however, is provided with this analysis run.

A second and third analysis concentrations displays an accurate concentration of the HFPO-DA in the diluted sample extract, but the value is uncorrected for the IDA recovery percentage from the original matrix. The recovery percentage presented with the second or third concentration represents a post-spike of IDA to benchmark the instrument quantification of native HFPO-DA.

Final recovery-corrected concentrations of the native HFPO-DA are provided by calculation using the original recovery value of the IDA and the diluted extract values of the native HFPO-DA. The final concentrations are calculated as follows:

- Q-1601, Q-1602 (Division Stack) Run #1 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(46.7\,ug) \times \left(\frac{114}{94}\right) = 56.6\,ug$$

- Q-1603, Q-1604 and Q-1606 (Division Stack) Run #1 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

$$(855\,ug) \times \left(\frac{96}{29}\right) = 2{,}830\,ug$$

- Q-1608, Q-1609 (Division Stack) Run #2 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(87.8\,ug)\ \times\ \left(\frac{101}{81}\right)\ =\ 109\ ug$$

- Q-1610, Q-1611 and Q-1613 (Division Stack) Run #2 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

$$(3800\,ug)\ \times\ \left(\frac{112}{89}\right)\ =\ 4{,}780\ ug$$

- Q-1615, Q-1616 (Division Stack) Run #3 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(128\,ug)\ \times\ \left(\frac{104}{73}\right)\ =\ 182\ ug$$

- Q-1617, Q-1618 and Q-1620 (Division Stack) Run #3 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

$$(2910\,ug)\ \times\ \left(\frac{111}{85}\right)\ =\ 3800\ ug$$

Chemours Testing Results
Division Stack Test Final Report
FINAL – February 9, 2018

Division Stack Test – Run #1

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	56.6	
Back Half XAD-2 Resin Composite	2830	Recovery Corrected
Condensate Composite	102	
Breakthrough XAD-2	ND (0.2)	

Division Stack Test – Run #2

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	109	Recovery Corrected
Back Half XAD-2 Resin Composite	4780	Recovery Corrected
Condensate Composite	101	
Breakthrough XAD-2	0.468	

Division Stack Test – Run #3

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	182	Recovery Corrected
Back Half XAD-2 Resin Composite	3800	Recovery Corrected
Condensate Composite	0.122	
Breakthrough XAD-2	0.901	

Division Stack Test – Blank Train

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	0.154	
Back Half XAD-2 Resin Composite	ND (0.200)	
Condensate Composite	0.586	
Breakthrough XAD-2	ND (0.0200)	

Division Stack Test – Other Blanks

Train Component	HFPO-DA Result (ug)	Comments
DI Water Reagent Blank	0.00134	
MeOH/5% NH_4OH Reagent Blank	ND (0.025)	
XAD-2 Reagent Blank	ND (0.200)	
MeOH Trip Blank	ND (0.025)	
XAD-2 Trip Blank	ND (0.200)	
Front Half Proof Blank	ND (0.025)	
Back Half Proof Blank	0.0985	
Impinger Glassware Proof Blank	ND (0.025)	

LCMS

Analysis Batch: 390728

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-390728/12	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 402754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-1	Q-1601,1602 M0010 RUN 1 FH	Total/NA	Air	None	
140-10529-1 - DL	Q-1601,1602 M0010 RUN 1 FH	Total/NA	Air	None	
140-10529-5	Q-1608,1609 M0010 RUN 2 FH	Total/NA	Air	None	
140-10529-5 - DL	Q-1608,1609 M0010 RUN 2 FH	Total/NA	Air	None	
140-10529-9	Q-1615,1616 M0010 RUN 3 FH	Total/NA	Air	None	
140-10529-9 - DL	Q-1615,1616 M0010 RUN 3 FH	Total/NA	Air	None	
140-10529-14	Q-1622,1623 M0010 RUN QC FH BT	Total/NA	Air	None	
140-10529-23	Q-1635 M0010 QC FH FILTER HOLDER & PROI	Total/NA	Air	None	
MB 280-402754/1-A	Method Blank	Total/NA	Air	None	
LCS 280-402754/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 402757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-2	Q-1603,1604,1606 M0010 RUN 1 BH	Total/NA	Air	None	
140-10529-2 - DL	Q-1603,1604,1606 M0010 RUN 1 BH	Total/NA	Air	None	
140-10529-4	Q-1607 M0010 RUN 1 XAD-2	Total/NA	Air	None	
140-10529-6 - DL	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	None	
140-10529-6	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	None	
140-10529-8	Q-1614 M0010 RUN 2 XAD-2	Total/NA	Air	None	
140-10529-10	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	None	
140-10529-10 - DL	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	None	
140-10529-12	Q-1621 M0010 RUN 3 XAD-2	Total/NA	Air	None	
140-10529-15	Q-1624,1625.1627 M0010 RUN QC BH BT	Total/NA	Air	None	
140-10529-17	Q-1628 M0010 RUN QC XAD-2 BT	Total/NA	Air	None	
140-10529-19	Q-1630 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	None	
140-10529-20	Q-1631 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	None	
140-10529-21	Q-1632 M0010 QC METHANOL TB	Total/NA	Air	None	
140-10529-22	Q-1633 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	None	
140-10529-24	Q-1637 M0010 QC BH FILTER HOLDER & COIL	Total/NA	Air	None	
140-10529-25	Q-1639 M0010 QC IMP GLASSWARE MEOH / 5	Total/NA	Air	None	
MB 280-402757/1-A	Method Blank	Total/NA	Air	None	
LCS 280-402757/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 402923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-3	Q-1605 M0010 RUN 1 COND	Total/NA	Air	None	
140-10529-16 - DL	Q-1626 M0010 RUN QC COND BT	Total/NA	Air	None	
140-10529-16	Q-1626 M0010 RUN QC COND BT	Total/NA	Air	None	
140-10529-18	Q-1629 M0010 QC DI WATER RB	Total/NA	Air	None	
MB 280-402923/1-A	Method Blank	Total/NA	Air	None	
LCS 280-402923/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-402923/8-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-402923/9-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 403013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-6 - RE	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	None	

LCMS (Continued)

Prep Batch: 403013 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-10 - RE	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	None	

Analysis Batch: 403263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-1	Q-1601,1602 M0010 RUN 1 FH	Total/NA	Air	8321A	402754
140-10529-5	Q-1608,1609 M0010 RUN 2 FH	Total/NA	Air	8321A	402754
140-10529-9	Q-1615,1616 M0010 RUN 3 FH	Total/NA	Air	8321A	402754
MB 280-402754/1-A	Method Blank	Total/NA	Air	8321A	402754
LCS 280-402754/2-A	Lab Control Sample	Total/NA	Air	8321A	402754

Analysis Batch: 403264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-2	Q-1603,1604,1606 M0010 RUN 1 BH	Total/NA	Air	8321A	402757
140-10529-6	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	8321A	402757
140-10529-10	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	8321A	402757
140-10529-19	Q-1630 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	8321A	402757
140-10529-20	Q-1631 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	8321A	402757
140-10529-21	Q-1632 M0010 QC METHANOL TB	Total/NA	Air	8321A	402757
140-10529-22	Q-1633 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	8321A	402757
140-10529-24	Q-1637 M0010 QC BH FILTER HOLDER & COIL	Total/NA	Air	8321A	402757
140-10529-25	Q-1639 M0010 QC IMP GLASSWARE MEOH / 5	Total/NA	Air	8321A	402757
MB 280-402757/1-A	Method Blank	Total/NA	Air	8321A	402757
LCS 280-402757/2-A	Lab Control Sample	Total/NA	Air	8321A	402757

Analysis Batch: 403405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-6 - RE	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	8321A	403013
140-10529-10 - RE	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	8321A	403013

Analysis Batch: 403406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-1 - DL	Q-1601,1602 M0010 RUN 1 FH	Total/NA	Air	8321A	402754
140-10529-5 - DL	Q-1608,1609 M0010 RUN 2 FH	Total/NA	Air	8321A	402754
140-10529-9 - DL	Q-1615,1616 M0010 RUN 3 FH	Total/NA	Air	8321A	402754
140-10529-14	Q-1622,1623 M0010 RUN QC FH BT	Total/NA	Air	8321A	402754
140-10529-23	Q-1635 M0010 QC FH FILTER HOLDER & PROI	Total/NA	Air	8321A	402754
MB 280-402754/1-A	Method Blank	Total/NA	Air	8321A	402754
LCS 280-402754/2-A	Lab Control Sample	Total/NA	Air	8321A	402754

Analysis Batch: 403407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-2 - DL	Q-1603,1604,1606 M0010 RUN 1 BH	Total/NA	Air	8321A	402757
140-10529-4	Q-1607 M0010 RUN 1 XAD-2	Total/NA	Air	8321A	402757
140-10529-6 - DL	Q-1610,1611,1613 M0010 RUN 2 BH	Total/NA	Air	8321A	402757
140-10529-8	Q-1614 M0010 RUN 2 XAD-2	Total/NA	Air	8321A	402757
140-10529-10 - DL	Q-1617,1618,1620 M0010 RUN 3 BH	Total/NA	Air	8321A	402757
140-10529-12	Q-1621 M0010 RUN 3 XAD-2	Total/NA	Air	8321A	402757
140-10529-15	Q-1624,1625.1627 M0010 RUN QC BH BT	Total/NA	Air	8321A	402757
140-10529-17	Q-1628 M0010 RUN QC XAD-2 BT	Total/NA	Air	8321A	402757

LCMS (Continued)

Analysis Batch: 403426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-3	Q-1605 M0010 RUN 1 COND	Total/NA	Air	8321A	402923
140-10529-16	Q-1626 M0010 RUN QC COND BT	Total/NA	Air	8321A	402923
140-10529-18	Q-1629 M0010 QC DI WATER RB	Total/NA	Air	8321A	402923
MB 280-402923/1-A	Method Blank	Total/NA	Air	8321A	402923
LCS 280-402923/2-A	Lab Control Sample	Total/NA	Air	8321A	402923
LCSD 280-402923/8-A	Lab Control Sample Dup	Total/NA	Air	8321A	402923
LLCS 280-402923/9-A	Lab Control Sample	Total/NA	Air	8321A	402923

Analysis Batch: 403428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-16 - DL	Q-1626 M0010 RUN QC COND BT	Total/NA	Air	8321A	402923

Prep Batch: 403577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-7 - DL	Q-1612 M0010 RUN 2 COND	Total/NA	Air	None	
140-10529-7	Q-1612 M0010 RUN 2 COND	Total/NA	Air	None	
140-10529-11	Q-1619 M0010 RUN 3 COND	Total/NA	Air	None	
MB 280-403577/6-A	Method Blank	Total/NA	Air	None	
LCS 280-403577/7-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-403577/8-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-403577/9-A	Lab Control Sample	Total/NA	Air	None	

Analysis Batch: 404051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10529-7	Q-1612 M0010 RUN 2 COND	Total/NA	Air	8321A	403577
140-10529-7 - DL	Q-1612 M0010 RUN 2 COND	Total/NA	Air	8321A	403577
140-10529-11	Q-1619 M0010 RUN 3 COND	Total/NA	Air	8321A	403577
MB 280-403577/6-A	Method Blank	Total/NA	Air	8321A	403577
LCS 280-403577/7-A	Lab Control Sample	Total/NA	Air	8321A	403577
LCSD 280-403577/8-A	Lab Control Sample Dup	Total/NA	Air	8321A	403577
LLCS 280-403577/9-A	Lab Control Sample	Total/NA	Air	8321A	403577

Client Sample ID: Q-1601,1602 M0010 RUN 1 FH

Lab Sample ID: 140-10529-1
Matrix: Air
Date Collected: 01/22/18 00:00
Date Received: 01/23/18 11:00
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	47.7	E	0.125	0.125	ug/Sample		01/25/18 09:11	01/30/18 13:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*50 - 200*	*01/25/18 09:11*	*01/30/18 13:33*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	46.7		1.25	1.25	ug/Sample		01/25/18 09:11	01/31/18 10:02	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*114*	*D*	*50 - 200*	*01/25/18 09:11*	*01/31/18 10:02*	*10*

Client Sample ID: Q-1603,1604,1606 M0010 RUN 1 BH

Lab Sample ID: 140-10529-2
Matrix: Air
Date Collected: 01/22/18 00:00
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	921	E	0.200	0.200	ug/Sample		01/25/18 09:18	01/30/18 13:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*29*	*X*	*50 - 200*	*01/25/18 09:18*	*01/30/18 13:59*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	855		10.0	10.0	ug/Sample		01/25/18 09:18	01/31/18 10:38	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*96*	*D*	*50 - 200*	*01/25/18 09:18*	*01/31/18 10:38*	*50*

Client Sample ID: Q-1605 M0010 RUN 1 COND

Lab Sample ID: 140-10529-3
Matrix: Air
Date Collected: 01/22/18 00:00
Date Received: 01/24/18 17:25
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	102		12.5	0.638	ug/Sample		01/30/18 16:15	01/31/18 12:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*		*50 - 200*	*01/30/18 16:15*	*01/31/18 12:36*	*1*

Client Sample ID: Q-1607 M0010 RUN 1 XAD-2

Lab Sample ID: 140-10529-4
Matrix: Air
Date Collected: 01/22/18 00:00
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/31/18 10:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	80		50 - 200	01/25/18 09:18	01/31/18 10:22	1

Client Sample ID: Q-1608,1609 M0010 RUN 2 FH

Lab Sample ID: 140-10529-5

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	81.2	E	0.100	0.100	ug/Sample		01/25/18 09:11	01/30/18 13:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	81		50 - 200	01/25/18 09:11	01/30/18 13:36	1

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	87.8		2.00	2.00	ug/Sample		01/25/18 09:11	01/31/18 10:05	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	101	D	50 - 200	01/25/18 09:11	01/31/18 10:05	20

Client Sample ID: Q-1610,1611,1613 M0010 RUN 2 BH

Lab Sample ID: 140-10529-6

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4070	E	0.200	0.200	ug/Sample		01/25/18 09:18	01/30/18 14:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	13	X	50 - 200	01/25/18 09:18	01/30/18 14:06	1

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	3780	E	10.0	10.0	ug/Sample		01/25/18 09:18	01/31/18 10:41	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	89	D	50 - 200	01/25/18 09:18	01/31/18 10:41	50

Method: 8321A - PFOA and PFOS - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	3800		100	100	ug/Sample		01/27/18 09:22	01/31/18 09:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	112		50 - 200	01/27/18 09:22	01/31/18 09:33	1

Client Sample ID: Q-1612 M0010 RUN 2 COND

Lab Sample ID: 140-10529-7

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	103	E	0.131	0.00669	ug/Sample		02/05/18 20:43	02/06/18 09:21	1

Client Sample ID: Q-1612 M0010 RUN 2 COND

Lab Sample ID: 140-10529-7

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 500ml - unpreserved

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	76		50 - 200	02/05/18 20:43	02/06/18 09:21	1

Method: 8321A - HFPO-DA - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	101		1.31	0.0669	ug/Sample		02/05/18 20:43	02/06/18 09:38	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	84	D	50 - 200	02/05/18 20:43	02/06/18 09:38	10

Client Sample ID: Q-1614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-10529-8

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.468		0.200	0.200	ug/Sample		01/25/18 09:18	01/31/18 10:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	64		50 - 200	01/25/18 09:18	01/31/18 10:25	1

Client Sample ID: Q-1615,1616 M0010 RUN 3 FH

Lab Sample ID: 140-10529-9

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	133	E	0.125	0.125	ug/Sample		01/25/18 09:11	01/30/18 13:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	73		50 - 200	01/25/18 09:11	01/30/18 13:40	1

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	128		6.25	6.25	ug/Sample		01/25/18 09:11	01/31/18 10:09	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	104	D	50 - 200	01/25/18 09:11	01/31/18 10:09	50

Client Sample ID: Q-1617,1618,1620 M0010 RUN 3 BH

Lab Sample ID: 140-10529-10

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	3180	E	0.200	0.200	ug/Sample		01/25/18 09:18	01/30/18 14:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	14	X	50 - 200	01/25/18 09:18	01/30/18 14:12	1

Client Sample ID: Q-1617,1618,1620 M0010 RUN 3 BH

Lab Sample ID: 140-10529-10
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2950	E	10.0	10.0	ug/Sample		01/25/18 09:18	01/31/18 10:44	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*	*D*	*50 - 200*	*01/25/18 09:18*	*01/31/18 10:44*	*50*

Method: 8321A - PFOA and PFOS - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2910		100	100	ug/Sample		01/27/18 09:22	01/31/18 09:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*111*		*50 - 200*	*01/27/18 09:22*	*01/31/18 09:36*	*1*

Client Sample ID: Q-1619 M0010 RUN 3 COND

Lab Sample ID: 140-10529-11
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.122	J	0.125	0.00638	ug/Sample		02/05/18 20:43	02/06/18 09:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:24*	*1*

Client Sample ID: Q-1621 M0010 RUN 3 XAD-2

Lab Sample ID: 140-10529-12
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: XAD Resin Tube - Large

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.901		0.200	0.200	ug/Sample		01/25/18 09:18	01/31/18 10:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*58*		*50 - 200*	*01/25/18 09:18*	*01/31/18 10:28*	*1*

Client Sample ID: Q-1622,1623 M0010 RUN QC FH BT

Lab Sample ID: 140-10529-14
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.154		0.0750	0.0750	ug/Sample		01/25/18 09:11	01/31/18 10:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*01/25/18 09:11*	*01/31/18 10:12*	*1*

Client Sample ID: Q-1624,1625.1627 M0010 RUN QC BH BT

Lab Sample ID: 140-10529-15
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/31/18 10:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*01/25/18 09:18*	*01/31/18 10:31*	*1*

Client Sample ID: Q-1626 M0010 RUN QC COND BT

Lab Sample ID: 140-10529-16
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.581**	**E**	0.00250	0.000128	ug/Sample		01/30/18 16:15	01/31/18 12:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*50 - 200*	*01/30/18 16:15*	*01/31/18 12:46*	*1*

Method: 8321A - HFPO-DA - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.586**		0.0250	0.00128	ug/Sample		01/30/18 16:15	01/31/18 13:51	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*	*D*	*50 - 200*	*01/30/18 16:15*	*01/31/18 13:51*	*10*

Client Sample ID: Q-1628 M0010 RUN QC XAD-2 BT

Lab Sample ID: 140-10529-17
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/31/18 10:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*88*		*50 - 200*	*01/25/18 09:18*	*01/31/18 10:35*	*1*

Client Sample ID: Q-1629 M0010 QC DI WATER RB

Lab Sample ID: 140-10529-18
Matrix: Air
Date Collected: 01/23/18 00:00
Date Received: 01/24/18 17:25
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.00134**	**J**	0.00250	0.000128	ug/Sample		01/30/18 16:15	01/31/18 12:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*01/30/18 16:15*	*01/31/18 12:49*	*1*

Client Sample ID: Q-1630 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-10529-19

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/30/18 14:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:28*	*1*

Client Sample ID: Q-1631 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-10529-20

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/30/18 14:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*80*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:32*	*1*

Client Sample ID: Q-1632 M0010 QC METHANOL TB

Lab Sample ID: 140-10529-21

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/30/18 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:35*	*1*

Client Sample ID: Q-1633 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-10529-22

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/30/18 14:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*113*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:38*	*1*

Client Sample ID: Q-1635 M0010 QC FH FILTER HOLDER & PROBE MEOH 55 NH4OH RINSE PB

Lab Sample ID: 140-10529-23

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 125mL - 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		01/25/18 09:11	01/31/18 10:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/25/18 09:11*	*01/31/18 10:15*	*1*

Client Sample ID: Q-1637 M0010 QC BH FILTER HOLDER & COIL COND MEOH 5% NH4OH RINSE PB

Lab Sample ID: 140-10529-24

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
Sample Container: Plastic 125mL - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.0985**		0.0250	0.0250	ug/Sample		01/25/18 09:18	01/30/18 14:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:41*	*1*

Client Sample ID: Q-1639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RINSE PB

Lab Sample ID: 140-10529-25

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25
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		01/25/18 09:18	01/30/18 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/25/18 09:18*	*01/30/18 14:45*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

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: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

Method: 8321A - HFPO-DA

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

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-10529-3	Q-1605 M0010 RUN 1 COND	85
140-10529-7 - DL	Q-1612 M0010 RUN 2 COND	84 D
140-10529-7	Q-1612 M0010 RUN 2 COND	76
140-10529-11	Q-1619 M0010 RUN 3 COND	83
140-10529-16	Q-1626 M0010 RUN QC COND	106
140-10529-16 - DL	Q-1626 M0010 RUN QC COND	108 D
140-10529-18	Q-1629 M0010 QC DI WATER F	112
LCS 280-402923/2-A	Lab Control Sample	113
LCS 280-403577/7-A	Lab Control Sample	86
LCSD 280-402923/8-A	Lab Control Sample Dup	115
LCSD 280-403577/8-A	Lab Control Sample Dup	87
LLCS 280-402923/9-A	Lab Control Sample	113
LLCS 280-403577/9-A	Lab Control Sample	86
MB 280-402923/1-A	Method Blank	115
MB 280-403577/6-A	Method Blank	86

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)
140-10529-1	Q-1601,1602 M0010 RUN 1 FH	94
140-10529-1 - DL	Q-1601,1602 M0010 RUN 1 FH	114 D
140-10529-2	Q-1603,1604,1606 M0010 RUN	29 X
140-10529-2 - DL	Q-1603,1604,1606 M0010 RUN	96 D
140-10529-4	Q-1607 M0010 RUN 1 XAD-2	80
140-10529-5	Q-1608,1609 M0010 RUN 2 FH	81
140-10529-5 - DL	Q-1608,1609 M0010 RUN 2 FH	101 D
140-10529-6	Q-1610,1611,1613 M0010 RUN	13 X
140-10529-6 - RE	Q-1610,1611,1613 M0010 RUN	112
140-10529-6 - DL	Q-1610,1611,1613 M0010 RUN	89 D
140-10529-8	Q-1614 M0010 RUN 2 XAD-2	64
140-10529-9	Q-1615,1616 M0010 RUN 3 FH	73
140-10529-9 - DL	Q-1615,1616 M0010 RUN 3 FH	104 D
140-10529-10	Q-1617,1618,1620 M0010 RUN	14 X
140-10529-10 - RE	Q-1617,1618,1620 M0010 RUN	111
140-10529-10 - DL	Q-1617,1618,1620 M0010 RUN	85 D
140-10529-12	Q-1621 M0010 RUN 3 XAD-2	58
140-10529-14	Q-1622,1623 M0010 RUN QC F	121
140-10529-15	Q-1624,1625.1627 M0010 RUN	86
140-10529-17	Q-1628 M0010 RUN QC XAD-2	88
140-10529-19	Q-1630 M0010 QC MEOH WITH	103
140-10529-20	Q-1631 M0010 QC XAD-2 RESI	80
140-10529-21	Q-1632 M0010 QC METHANOL	106
140-10529-22	Q-1633 M0010 QC XAD-2 RESI	113

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

Method: 8321A - PFOA and PFOS (Continued)

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

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HFPODA (50-200)							
140-10529-23	Q-1635 M0010 QC FH FILTER I	103							
140-10529-24	Q-1637 M0010 QC BH FILTER I	103							
140-10529-25	Q-1639 M0010 QC IMP GLASS\	103							
DLCK 280-390728/12	Lab Control Sample	102							
LCS 280-402754/2-A	Lab Control Sample	110							
LCS 280-402754/2-A	Lab Control Sample	122							
LCS 280-402757/2-A	Lab Control Sample	79							
MB 280-402754/1-A	Method Blank	110							
MB 280-402754/1-A	Method Blank	121							
MB 280-402757/1-A	Method Blank	74							

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-402923/1-A
Matrix: Air
Analysis Batch: 403426

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402923

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.625	0.0319	ug/Sample		01/30/18 16:15	01/31/18 12:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*115*		*50 - 200*	*01/30/18 16:15*	*01/31/18 12:23*	*1*

Lab Sample ID: LCS 280-402923/2-A
Matrix: Air
Analysis Batch: 403426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402923

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			12.5	10.97		ug/Sample		88	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Lab Sample ID: LCSD 280-402923/8-A
Matrix: Air
Analysis Batch: 403426

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 402923

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			12.5	11.24		ug/Sample		90	50 - 150	2	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*115*		*50 - 200*

Lab Sample ID: LLCS 280-402923/9-A
Matrix: Air
Analysis Batch: 403426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402923

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			1.25	0.9815		ug/Sample		79	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Lab Sample ID: MB 280-403577/6-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 403577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		02/05/18 20:43	02/06/18 09:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:08*	*1*

Method: 8321A - HFPO-DA (Continued)

Lab Sample ID: LCS 280-403577/7-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.05033		ug/Sample		101	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*86*		*50 - 200*

Lab Sample ID: LCSD 280-403577/8-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.06103		ug/Sample		122	50 - 150	19	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*87*		*50 - 200*

Lab Sample ID: LLCS 280-403577/9-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.003739		ug/Sample		75	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*86*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-390728/12
Matrix: Air
Analysis Batch: 390728

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	0.1941		ug/L		78	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*102*		*50 - 200*

Lab Sample ID: MB 280-402754/1-A
Matrix: Air
Analysis Batch: 403263

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		01/25/18 09:11	01/30/18 13:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*110*		*50 - 200*	*01/25/18 09:11*	*01/30/18 13:27*	*1*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-402754/1-A
Matrix: Air
Analysis Batch: 403406

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		01/25/18 09:11	01/31/18 09:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*01/25/18 09:11*	*01/31/18 09:56*	*1*

Lab Sample ID: LCS 280-402754/2-A
Matrix: Air
Analysis Batch: 403263

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402754

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.4574		ug/Sample		91	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*110*		*50 - 200*

Lab Sample ID: LCS 280-402754/2-A
Matrix: Air
Analysis Batch: 403406

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402754

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.4582		ug/Sample		92	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*122*		*50 - 200*

Lab Sample ID: MB 280-402757/1-A
Matrix: Air
Analysis Batch: 403264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402757

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		01/25/18 09:18	01/30/18 13:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*74*		*50 - 200*	*01/25/18 09:18*	*01/30/18 13:53*	*1*

Lab Sample ID: LCS 280-402757/2-A
Matrix: Air
Analysis Batch: 403264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402757

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.484		ug/Sample		87	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*79*		*50 - 200*

Client Sample ID: Q-1601,1602 M0010 RUN 1 FH

Lab Sample ID: 140-10529-1

Date Collected: 01/22/18 00:00

Matrix: Air

Date Received: 01/23/18 11:00

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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403263	01/30/18 13:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	250 mL	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A	DL	10			403406	01/31/18 10:02	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1603,1604,1606 M0010 RUN 1 BH

Lab Sample ID: 140-10529-2

Date Collected: 01/22/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 13:59	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	400 mL	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A	DL	50			403407	01/31/18 10:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1605 M0010 RUN 1 COND

Lab Sample ID: 140-10529-3

Date Collected: 01/22/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0002 Sample	5 mL	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1607 M0010 RUN 1 XAD-2

Lab Sample ID: 140-10529-4

Date Collected: 01/22/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403407	01/31/18 10:22	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1608,1609 M0010 RUN 2 FH

Lab Sample ID: 140-10529-5

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403263	01/30/18 13:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	200 mL	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A	DL	20			403406	01/31/18 10:05	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1610,1611,1613 M0010 RUN 2 BH

Lab Sample ID: 140-10529-6

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:06	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	RE		0.00025 Sample	50 mL	403013	01/27/18 09:22		TAL DEN
Total/NA	Analysis	8321A	RE	1			403405	01/31/18 09:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	400 mL	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A	DL	50			403407	01/31/18 10:41	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1612 M0010 RUN 2 COND

Lab Sample ID: 140-10529-7

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.01905 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:21	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		0.01905 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A	DL	10			404051	02/06/18 09:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-10529-8

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403407	01/31/18 10:25	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1615,1616 M0010 RUN 3 FH

Lab Sample ID: 140-10529-9

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403263	01/30/18 13:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	250 mL	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A	DL	50			403406	01/31/18 10:09	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1617,1618,1620 M0010 RUN 3 BH

Lab Sample ID: 140-10529-10

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	RE		0.00025 Sample	50 mL	403013	01/27/18 09:22		TAL DEN
Total/NA	Analysis	8321A	RE	1			403405	01/31/18 09:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	400 mL	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A	DL	50			403407	01/31/18 10:44	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1619 M0010 RUN 3 COND

Lab Sample ID: 140-10529-11

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.02 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:24	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1621 M0010 RUN 3 XAD-2

Lab Sample ID: 140-10529-12

Date Collected: 01/23/18 00:00

Matrix: Air

Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403407	01/31/18 10:28	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1622,1623 M0010 RUN QC FH BT — Lab Sample ID: 140-10529-14

Date Collected: 01/23/18 00:00 — **Matrix: Air**
Date Received: 01/24/18 17:25

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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403406	01/31/18 10:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1624,1625.1627 M0010 RUN QC BH BT — Lab Sample ID: 140-10529-15

Date Collected: 01/23/18 00:00 — **Matrix: Air**
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403407	01/31/18 10:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1626 M0010 RUN QC COND BT — Lab Sample ID: 140-10529-16

Date Collected: 01/23/18 00:00 — **Matrix: Air**
Date Received: 01/24/18 17:25

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	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:46	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	5 mL	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A	DL	10			403428	01/31/18 13:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1628 M0010 RUN QC XAD-2 BT — Lab Sample ID: 140-10529-17

Date Collected: 01/23/18 00:00 — **Matrix: Air**
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403407	01/31/18 10:35	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1629 M0010 QC DI WATER RB — Lab Sample ID: 140-10529-18

Date Collected: 01/23/18 00:00 — **Matrix: Air**
Date Received: 01/24/18 17:25

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	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:49	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1630 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-10529-19

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:28	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1631 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-10529-20

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:32	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1632 M0010 QC METHANOL TB

Lab Sample ID: 140-10529-21

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:35	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1633 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-10529-22

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1635 M0010 QC FH FILTER HOLDER & PROBE MEOH 55 NH4OH RINSE PB

Lab Sample ID: 140-10529-23

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403406	01/31/18 10:15	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1637 M0010 QC BH FILTER HOLDER & COIL COND MEOH 5% NH4OH RINSE PB

Lab Sample ID: 140-10529-24

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:41	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RINSE PB

Lab Sample ID: 140-10529-25

Date Collected: 01/23/18 00:00
Matrix: Air
Date Received: 01/24/18 17:25

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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 14:45	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-402754/1-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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403263	01/30/18 13:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	50 mL	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403406	01/31/18 09:56	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-402757/1-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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 13:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-402923/1-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			0.004 Sample	5 mL	402923	01/30/18 16:15		TAL DEN

Client Sample ID: Method Blank
Lab Sample ID: MB 280-402923/1-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	Analysis	8321A		1			403426	01/31/18 12:23	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-403577/6-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-390728/12

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			390728	10/10/17 10:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-402754/2-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	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403263	01/30/18 13:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None			1 Sample	50 mL	402754	01/25/18 09:11		TAL DEN
Total/NA	Analysis	8321A		1			403406	01/31/18 09:59	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-402757/2-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	402757	01/25/18 09:18		TAL DEN
Total/NA	Analysis	8321A		1			403264	01/30/18 13:56	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-402923/2-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			0.004 Sample	5 mL	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:26	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-403577/7-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-402923/8-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			0.004 Sample	5 mL	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:29	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-403577/8-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:15	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LLCS 280-402923/9-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			0.004 Sample	5 mL	402923	01/30/18 16:15		TAL DEN
Total/NA	Analysis	8321A		1			403426	01/31/18 12:32	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample **Lab Sample ID: LLCS 280-403577/9-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:18	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: Division Stack Emissions Test

TestAmerica Job ID: 140-10529-1

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	02-28-18
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	04-13-18
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	03-31-18
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		P330-13-00262	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	04-05-18
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	04-01-18
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.: 140-10529-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 390728

Lab Sample ID: STD001 280-390728/3 IC Client Sample ID:

Date Analyzed: 10/10/17 09:35 Lab File ID: hfpo717J10026.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.89	Baseline	meyera	10/10/17 11:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10529-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403264

Lab Sample ID: 140-10529-20 Client Sample ID: Q-1631 M0010 QC XAD-2 RESIN TUBE RB

Date Analyzed: 01/30/18 14:32 Lab File ID: hfpo718A30050.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.02	Baseline	meyera	01/31/18 08:37

Lab Sample ID: 140-10529-22 Client Sample ID: Q-1633 M0010 QC XAD-2 RESIN TUBE TB

Date Analyzed: 01/30/18 14:38 Lab File ID: hfpo718A30052.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.04	Assign Peak	meyera	01/31/18 08:37

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10529-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403406

Lab Sample ID: 140-10529-23 Client Sample ID: Q-1635 M0010 QC FH FILTER HOLDER & PROBE MEOH 55 NH4OH RINSE

Date Analyzed: 01/31/18 10:15 Lab File ID: hfpo718A31018.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.02	Assign Peak	meyera	01/31/18 14:49

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10529-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403407

Lab Sample ID: 140-10529-15 Client Sample ID: Q-1624,1625.1627 M0010 RUN QC BH BT

Date Analyzed: 01/31/18 10:31 Lab File ID: hfpo718A31023.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.02	Assign Peak	meyera	01/31/18 14:50

Lab Sample ID: 140-10529-17 Client Sample ID: Q-1628 M0010 RUN QC XAD-2 BT

Date Analyzed: 01/31/18 10:35 Lab File ID: hfpo718A31024.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA		Invalid Compound ID	meyera	01/31/18 14:50

Lab Sample ID: 140-10529-6 DL Client Sample ID: Q-1610,1611,1613 M0010 RUN 2 BH DL

Date Analyzed: 01/31/18 10:41 Lab File ID: hfpo718A31026.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3 HFPO-DA	1.00	Baseline	meyera	01/31/18 14:51

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10529-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403426

Lab Sample ID: LLCS 280-402923/9-A Client Sample ID:

Date Analyzed: 01/31/18 12:32 Lab File ID: hfpo718A31060.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.95	Baseline	meyera	01/31/18 14:53

Lab Sample ID: 140-10529-18 Client Sample ID: Q-1629 M0010 QC DI WATER RB

Date Analyzed: 01/31/18 12:49 Lab File ID: hfpo718A31065.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.95	Baseline	meyera	01/31/18 14:54

ANALYTICAL REPORT

Job Number: 140-10553-1

Job Description: PPA Stack Emissions Test

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
2/20/2018 10:21 AM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
02/20/2018

Table of Contents

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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.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

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: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

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: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-10553-1	E-2601,2602 M0010 RUN 1 FH	Air	01/24/18 10:00	01/26/18 11:40
140-10553-2	E-2603,2604,2606 M0010 RUN 1 BH	Air	01/24/18 10:00	01/26/18 11:40
140-10553-3	E-2605 M0010 RUN 1 COND	Air	01/24/18 10:00	01/26/18 11:40
140-10553-4	E-2607 M0010 RUN 1 XAD-2	Air	01/24/18 10:00	01/26/18 11:40
140-10553-5	E-2608,E-2609 M0010 RUN 2 FH	Air	01/24/18 10:00	01/26/18 11:40
140-10553-6	E-2610,2611,2613 M0010 RUN 2 BH	Air	01/24/18 10:00	01/26/18 11:40
140-10553-7	E-2612 M0010 RUN 2 COND	Air	01/24/18 10:00	01/26/18 11:40
140-10553-8	E-2614 M0010 RUN 2 XAD-2	Air	01/24/18 10:00	01/26/18 11:40
140-10553-9	E-2615,2616 M0010 RUN 3 FH	Air	01/25/18 10:00	01/26/18 11:40
140-10553-10	E-2617,2618,2620 M0010 RUN 3 BH	Air	01/25/18 10:00	01/26/18 11:40
140-10553-11	E-2619 M0010 RUN 3 COND	Air	01/25/18 10:00	01/26/18 11:40
140-10553-12	E-2621 M0010 RUN 3 XAD-2	Air	01/25/18 10:00	01/26/18 11:40
140-10553-13	E-2622,2623 M0010 RUN QC FH BT	Air	01/24/18 10:00	01/26/18 11:40
140-10553-14	E-2624,2625,2627 M0010 QC BH	Air	01/24/18 10:00	01/26/18 11:40
140-10553-15	E-2626 M0010 RUN QC COND BT	Air	01/24/18 10:00	01/26/18 11:40
140-10553-16	E-2628 M0010 RUN QC XAD-2 BT	Air	01/24/18 10:00	01/26/18 11:40
140-10553-17	E-2629 M0010 QC DI WATER RB	Air	01/25/18 10:00	01/26/18 11:40
140-10553-18	E-2630 M0010 QC MEOH WITH 5% NH4OH RB	Air	01/25/18 10:00	01/26/18 11:40
140-10553-19	E-2631 M0010 QC XAD-2 RESIN TUBE RB	Air	01/24/18 10:00	01/26/18 11:40
140-10553-20	E-2632 M0010 QC METHANOL TB	Air	01/25/18 10:00	01/26/18 11:40
140-10553-21	E-2633 M0010 QC XAD-2 RESIN TUBE TB	Air	01/24/18 10:00	01/26/18 11:40
140-10553-24	E-2639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RIN PB	Air	01/24/18 10:00	01/26/18 11:40
140-10553-25	E-2640,2641 M0010 RUN 4 FH	Air	01/25/18 10:00	01/26/18 11:40
140-10553-26	E-2642,2643,2645 M0010 RUN 4 BH	Air	01/25/18 10:00	01/26/18 11:40
140-10553-27	E-2644 M0010 RUN 4 COND	Air	01/25/18 10:00	01/26/18 11:40
140-10553-28	E-2646 M0010 RUN 4 XAD-2	Air	01/25/18 10:00	01/26/18 11:40

Job Narrative
140-10553-1

Sample Receipt

The samples were received on January 26, 2018 at 11:40 AM in good condition and properly preserved. The temperatures of the 3 coolers at receipt time were 2.3º 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

Samples associated with this analytical batch were originally analyzed with an "E" flag to indicate that the HFPO-DA exceeded the calibration curve of the method. Project specific calculations are provided as an addendum to this narrative.

Organic Prep

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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.

Chemours PPA Stack Emissions Test Analytical Report
TestAmerica Job No. 140-10553-1
February 9, 2018

The following samples exceeded the Method 8321A calibration range for HFPO-DA and required that dilution of the extracts be performed:

- E-2601, E-2602 (PPA Stack) Run #1 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- E-2608, E-2609 (PPA Stack) Run #2 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- E-2610, E-2611 and E-2613 (PPA Stack) Run #2 Back-Half Composite (XAD-2 Resin and Glassware Rinses)
- E-2615, E-2616 (PPA Stack) Run #3 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- E-2640, E-2641 (PPA Stack) Run #4 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)
- E-2642, E-2643 and E-2645 (PPA Stack) Run #4 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

The original analysis concentration which displays the “E” flag is provided with the data set indicating that the value provided is estimated. The $^{13}C_3$ – HFPO-DA isotope dilution internal standard (IDA) recovery percentage (%) however, is provided with this analysis run.

A second and third analysis concentrations displays an accurate concentration of the HFPO-DA in the diluted sample extract, but the value is uncorrected for the IDA recovery percentage from the original matrix. The recovery percentage presented with the second or third concentration represents a post-spike of IDA to benchmark the instrument quantification of native HFPO-DA.

Final recovery-corrected concentrations of the native HFPO-DA are provided by calculation using the original recovery value of the IDA and the diluted extract values of the native HFPO-DA. The final concentrations are calculated as follows:

- E-2601, E-2602 (PPA Stack) Run #1 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(244\ ug)\ \times\ \left(\frac{174}{58}\right)\ =\ 732\ ug$$

- E-2608, E-2609 (PPA Stack) Run #2 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(1{,}280\ ug)\ \times\ \left(\frac{97}{147}\right)\ =\ 845\ ug$$

- E-2610, E-2611 and E-2613 (PPA Stack) Run #2 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

$$(17{,}600\ ug)\ \times\ \left(\frac{119}{102}\right)\ =\ 20{,}533\ ug$$

- E-2615, E-2616 (PPA Stack) Run #3 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(263\ ug)\ \times\ \left(\frac{161}{57}\right)\ =\ 743\ ug$$

- E-2640, E-2641 (PPA Stack) Run #4 Front-Half Composite (Filter and Front Half of Filter Holder Rinses)

$$(26.3\ ug)\ \times\ \left(\frac{129}{99}\right)\ =\ 34.3\ ug$$

- E-2642, E-2643 and E-2645 (PPA Stack) Run #4 Back-Half Composite (XAD-2 Resin and Glassware Rinses)

$$(135\ ug)\ \times\ \left(\frac{76}{71}\right)\ =\ 145\ ug$$

Chemours Testing Results

PPA Stack Test Final Report
FINAL – February 9, 2018

PPA Stack Test – Run #1

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	732	Recovery Corrected
Back Half XAD-2 Resin Composite	1.54	
Condensate Composite	48.5	
Breakthrough XAD-2	ND (0.200)	

PPA Stack Test – Run #2

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	845	Recovery Corrected
Back Half XAD-2 Resin Composite	20,533	Recovery Corrected
Condensate Composite	0.188	
Breakthrough XAD-2	ND (0.200)	

PPA Stack Test – Run #3

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	743	Recovery Corrected
Back Half XAD-2 Resin Composite	5.86	
Condensate Composite	0.0522	
Breakthrough XAD-2	ND (0.200)	

PPA Stack Test – Blank Train

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	0.0549	
Back Half XAD-2 Resin Composite	0.200	
Condensate Composite	ND (0.0025)	
Breakthrough XAD-2	ND (0.200)	

PPA Stack Test – Run #4

Train Component	HFPO-DA Result (ug)	Comments
Particulate Filter Composite	34.3	Recovery Corrected
Back Half XAD-2 Resin Composite	144	Recovery Corrected
Condensate Composite	ND (0.122)	
Breakthrough XAD-2	ND (0.200)	

PPA Stack Test – Other Blanks

Train Component	HFPO-DA Result (ug)	Comments
DI Water Reagent Blank	ND (0.0025)	
MeOH/5% NH_4OH Reagent Blank	ND (0.025)	
XAD-2 Reagent Blank	ND (0.200)	
MeOH Trip Blank	ND (0.025)	
XAD-2 Trip Blank	ND (0.200)	
Impinger Glassware Proof Blank	1.55	

LCMS

Analysis Batch: 390728

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-390728/12	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 402938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-2	E-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	None	
140-10553-4	E-2607 M0010 RUN 1 XAD-2	Total/NA	Air	None	
140-10553-6 - DL	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	
140-10553-6	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	
140-10553-8	E-2614 M0010 RUN 2 XAD-2	Total/NA	Air	None	
140-10553-10	E-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	None	
140-10553-12	E-2621 M0010 RUN 3 XAD-2	Total/NA	Air	None	
140-10553-14	E-2624,2625,2627 M0010 QC BH	Total/NA	Air	None	
140-10553-16	E-2628 M0010 RUN QC XAD-2 BT	Total/NA	Air	None	
140-10553-18	E-2630 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	None	
140-10553-19	E-2631 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	None	
140-10553-20	E-2632 M0010 QC METHANOL TB	Total/NA	Air	None	
140-10553-21	E-2633 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	None	
140-10553-26 - DL	E-2642,2643,2645 M0010 RUN 4 BH	Total/NA	Air	None	
140-10553-26	E-2642,2643,2645 M0010 RUN 4 BH	Total/NA	Air	None	
140-10553-28	E-2646 M0010 RUN 4 XAD-2	Total/NA	Air	None	
MB 280-402938/1-A	Method Blank	Total/NA	Air	None	
LCS 280-402938/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 403009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-1	E-2601,2602 M0010 RUN 1 FH	Total/NA	Air	None	
140-10553-1 - DL	E-2601,2602 M0010 RUN 1 FH	Total/NA	Air	None	
140-10553-5 - DL	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	None	
140-10553-5	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	None	
140-10553-9	E-2615,2616 M0010 RUN 3 FH	Total/NA	Air	None	
140-10553-9 - DL	E-2615,2616 M0010 RUN 3 FH	Total/NA	Air	None	
140-10553-13	E-2622,2623 M0010 RUN QC FH BT	Total/NA	Air	None	
140-10553-24	E-2639 M0010 QC IMP GLASSWARE MEOH / 5	Total/NA	Air	None	
140-10553-25 - DL	E-2640,2641 M0010 RUN 4 FH	Total/NA	Air	None	
140-10553-25	E-2640,2641 M0010 RUN 4 FH	Total/NA	Air	None	
MB 280-403009/1-A	Method Blank	Total/NA	Air	None	
LCS 280-403009/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 403032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-3	E-2605 M0010 RUN 1 COND	Total/NA	Air	None	
140-10553-15	E-2626 M0010 RUN QC COND BT	Total/NA	Air	None	
140-10553-17	E-2629 M0010 QC DI WATER RB	Total/NA	Air	None	
MB 280-403032/1-A	Method Blank	Total/NA	Air	None	
LCS 280-403032/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-403032/9-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-403032/10-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 403033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-6 - DL2	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	

LCMS (Continued)

Prep Batch: 403033 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-6 - DL3	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	None	

Analysis Batch: 403265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-2	E-2603,2604,2606 M0010 RUN 1 BH	Total/NA	Air	8321A	402938
140-10553-4	E-2607 M0010 RUN 1 XAD-2	Total/NA	Air	8321A	402938
140-10553-6	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	402938
140-10553-18	E-2630 M0010 QC MEOH WITH 5% NH4OH RB	Total/NA	Air	8321A	402938
140-10553-19	E-2631 M0010 QC XAD-2 RESIN TUBE RB	Total/NA	Air	8321A	402938
140-10553-20	E-2632 M0010 QC METHANOL TB	Total/NA	Air	8321A	402938
140-10553-21	E-2633 M0010 QC XAD-2 RESIN TUBE TB	Total/NA	Air	8321A	402938
140-10553-26	E-2642,2643,2645 M0010 RUN 4 BH	Total/NA	Air	8321A	402938
MB 280-402938/1-A	Method Blank	Total/NA	Air	8321A	402938
LCS 280-402938/2-A	Lab Control Sample	Total/NA	Air	8321A	402938

Analysis Batch: 403266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-1	E-2601,2602 M0010 RUN 1 FH	Total/NA	Air	8321A	403009
140-10553-5	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	8321A	403009
140-10553-9	E-2615,2616 M0010 RUN 3 FH	Total/NA	Air	8321A	403009
140-10553-25	E-2640,2641 M0010 RUN 4 FH	Total/NA	Air	8321A	403009
MB 280-403009/1-A	Method Blank	Total/NA	Air	8321A	403009
LCS 280-403009/2-A	Lab Control Sample	Total/NA	Air	8321A	403009

Analysis Batch: 403405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-6 - DL2	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	403033

Analysis Batch: 403423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-6 - DL	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	402938
140-10553-8	E-2614 M0010 RUN 2 XAD-2	Total/NA	Air	8321A	402938
140-10553-10	E-2617,2618,2620 M0010 RUN 3 BH	Total/NA	Air	8321A	402938
140-10553-12	E-2621 M0010 RUN 3 XAD-2	Total/NA	Air	8321A	402938
140-10553-14	E-2624,2625,2627 M0010 QC BH	Total/NA	Air	8321A	402938
140-10553-16	E-2628 M0010 RUN QC XAD-2 BT	Total/NA	Air	8321A	402938
140-10553-26 - DL	E-2642,2643,2645 M0010 RUN 4 BH	Total/NA	Air	8321A	402938
140-10553-28	E-2646 M0010 RUN 4 XAD-2	Total/NA	Air	8321A	402938

Analysis Batch: 403424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-1 - DL	E-2601,2602 M0010 RUN 1 FH	Total/NA	Air	8321A	403009
140-10553-5 - DL	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	8321A	403009
140-10553-6 - DL3	E-2610,2611,2613 M0010 RUN 2 BH	Total/NA	Air	8321A	403033
140-10553-9 - DL	E-2615,2616 M0010 RUN 3 FH	Total/NA	Air	8321A	403009
140-10553-13	E-2622,2623 M0010 RUN QC FH BT	Total/NA	Air	8321A	403009
140-10553-24	E-2639 M0010 QC IMP GLASSWARE MEOH / 5	Total/NA	Air	8321A	403009
140-10553-25 - DL	E-2640,2641 M0010 RUN 4 FH	Total/NA	Air	8321A	403009

LCMS (Continued)

Analysis Batch: 403425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-3	E-2605 M0010 RUN 1 COND	Total/NA	Air	8321A	403032
140-10553-15	E-2626 M0010 RUN QC COND BT	Total/NA	Air	8321A	403032
140-10553-17	E-2629 M0010 QC DI WATER RB	Total/NA	Air	8321A	403032
MB 280-403032/1-A	Method Blank	Total/NA	Air	8321A	403032
LCS 280-403032/2-A	Lab Control Sample	Total/NA	Air	8321A	403032
LCSD 280-403032/9-A	Lab Control Sample Dup	Total/NA	Air	8321A	403032
LLCS 280-403032/10-A	Lab Control Sample	Total/NA	Air	8321A	403032

Prep Batch: 403577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-7	E-2612 M0010 RUN 2 COND	Total/NA	Air	None	
140-10553-11	E-2619 M0010 RUN 3 COND	Total/NA	Air	None	
140-10553-27	E-2644 M0010 RUN 4 COND	Total/NA	Air	None	
MB 280-403577/6-A	Method Blank	Total/NA	Air	None	
LCS 280-403577/7-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-403577/8-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-403577/9-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 403598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-5 - RE	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	None	

Analysis Batch: 403903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-5 - RE	E-2608,E-2609 M0010 RUN 2 FH	Total/NA	Air	8321A	403598

Analysis Batch: 404051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-10553-7	E-2612 M0010 RUN 2 COND	Total/NA	Air	8321A	403577
140-10553-11	E-2619 M0010 RUN 3 COND	Total/NA	Air	8321A	403577
140-10553-27	E-2644 M0010 RUN 4 COND	Total/NA	Air	8321A	403577
MB 280-403577/6-A	Method Blank	Total/NA	Air	8321A	403577
LCS 280-403577/7-A	Lab Control Sample	Total/NA	Air	8321A	403577
LCSD 280-403577/8-A	Lab Control Sample Dup	Total/NA	Air	8321A	403577
LLCS 280-403577/9-A	Lab Control Sample	Total/NA	Air	8321A	403577

Client Sample ID: E-2601,2602 M0010 RUN 1 FH

Lab Sample ID: 140-10553-1
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	248	E	0.100	0.100	ug/Sample		01/27/18 07:35	01/30/18 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*58*		*50 - 200*	*01/27/18 07:35*	*01/30/18 15:57*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	244		5.00	5.00	ug/Sample		01/27/18 07:35	01/31/18 11:20	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*174*	*D*	*50 - 200*	*01/27/18 07:35*	*01/31/18 11:20*	*50*

Client Sample ID: E-2603,2604,2606 M0010 RUN 1 BH

Lab Sample ID: 140-10553-2
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	1.54		0.200	0.200	ug/Sample		01/26/18 12:10	01/30/18 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*79*		*50 - 200*	*01/26/18 12:10*	*01/30/18 14:58*	*1*

Client Sample ID: E-2605 M0010 RUN 1 COND

Lab Sample ID: 140-10553-3
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	48.5		12.5	0.638	ug/Sample		01/30/18 16:12	01/31/18 12:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*82*		*50 - 200*	*01/30/18 16:12*	*01/31/18 12:00*	*1*

Client Sample ID: E-2607 M0010 RUN 1 XAD-2

Lab Sample ID: 140-10553-4
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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		01/26/18 12:10	01/30/18 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:01*	*1*

Client Sample ID: E-2608,E-2609 M0010 RUN 2 FH

Lab Sample ID: 140-10553-5

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	1090	E	0.0750	0.0750	ug/Sample		01/27/18 07:35	01/30/18 16:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*21*	*X*	*50 - 200*	*01/27/18 07:35*	*01/30/18 16:00*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1090	E	3.75	3.75	ug/Sample		01/27/18 07:35	01/31/18 11:24	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*147*	*D*	*50 - 200*	*01/27/18 07:35*	*01/31/18 11:24*	*50*

Method: 8321A - PFOA and PFOS - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1280		37.3	37.3	ug/Sample		02/01/18 14:36	02/05/18 12:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*97*		*50 - 200*	*02/01/18 14:36*	*02/05/18 12:08*	*1*

Client Sample ID: E-2610,2611,2613 M0010 RUN 2 BH

Lab Sample ID: 140-10553-6

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	11100	E	0.200	0.200	ug/Sample		01/26/18 12:10	01/30/18 15:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*8*	*X*	*50 - 200*	*01/26/18 12:10*	*01/30/18 15:04*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	12200	E	10.0	10.0	ug/Sample		01/26/18 12:10	01/31/18 11:11	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*102*	*D*	*50 - 200*	*01/26/18 12:10*	*01/31/18 11:11*	*50*

Method: 8321A - PFOA and PFOS - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	18000	E	100	100	ug/Sample		01/28/18 09:20	01/31/18 09:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/28/18 09:20*	*01/31/18 09:43*	*1*

Method: 8321A - PFOA and PFOS - DL3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	17600		1000	1000	ug/Sample		01/28/18 09:20	01/31/18 11:40	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*119*		*50 - 200*	*01/28/18 09:20*	*01/31/18 11:40*	*10*

Client Sample ID: E-2612 M0010 RUN 2 COND

Lab Sample ID: 140-10553-7

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.188		0.126	0.00644	ug/Sample		02/05/18 20:43	02/06/18 09:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:28*	*1*

Client Sample ID: E-2614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-10553-8

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/31/18 10:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*50 - 200*	*01/26/18 12:10*	*01/31/18 10:51*	*1*

Client Sample ID: E-2615,2616 M0010 RUN 3 FH

Lab Sample ID: 140-10553-9

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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	255	E	0.100	0.100	ug/Sample		01/27/18 07:35	01/30/18 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*57*		*50 - 200*	*01/27/18 07:35*	*01/30/18 16:03*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	263		5.00	5.00	ug/Sample		01/27/18 07:35	01/31/18 11:27	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*161*	*D*	*50 - 200*	*01/27/18 07:35*	*01/31/18 11:27*	*50*

Client Sample ID: E-2617,2618,2620 M0010 RUN 3 BH

Lab Sample ID: 140-10553-10

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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	5.86		0.200	0.200	ug/Sample		01/26/18 12:10	01/31/18 10:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*81*		*50 - 200*	*01/26/18 12:10*	*01/31/18 10:54*	*1*

Client Sample ID: E-2619 M0010 RUN 3 COND

Lab Sample ID: 140-10553-11
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 11:40
Sample Container: Plastic 500ml - unpreserved

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0522	J	0.124	0.00631	ug/Sample		02/05/18 20:43	02/06/18 09:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*81*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:31*	*1*

Client Sample ID: E-2621 M0010 RUN 3 XAD-2

Lab Sample ID: 140-10553-12
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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		01/26/18 12:10	01/31/18 10:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*01/26/18 12:10*	*01/31/18 10:57*	*1*

Client Sample ID: E-2622,2623 M0010 RUN QC FH BT

Lab Sample ID: 140-10553-13
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	0.0549		0.0500	0.0500	ug/Sample		01/27/18 07:35	01/31/18 11:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*120*		*50 - 200*	*01/27/18 07:35*	*01/31/18 11:30*	*1*

Client Sample ID: E-2624,2625,2627 M0010 QC BH

Lab Sample ID: 140-10553-14
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	0.200		0.200	0.200	ug/Sample		01/26/18 12:10	01/31/18 11:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*81*		*50 - 200*	*01/26/18 12:10*	*01/31/18 11:01*	*1*

Client Sample ID: E-2626 M0010 RUN QC COND BT

Lab Sample ID: 140-10553-15
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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		0.00250	0.000128	ug/Sample		01/30/18 16:12	01/31/18 12:10	1

Client Sample ID: E-2626 M0010 RUN QC COND BT

Lab Sample ID: 140-10553-15

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 11:40
Sample Container: Plastic 500ml - unpreserved

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*119*		*50 - 200*	*01/30/18 16:12*	*01/31/18 12:10*	*1*

Client Sample ID: E-2628 M0010 RUN QC XAD-2 BT

Lab Sample ID: 140-10553-16

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/31/18 11:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*01/26/18 12:10*	*01/31/18 11:04*	*1*

Client Sample ID: E-2629 M0010 QC DI WATER RB

Lab Sample ID: 140-10553-17

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/30/18 16:12	01/31/18 12:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*114*		*50 - 200*	*01/30/18 16:12*	*01/31/18 12:13*	*1*

Client Sample ID: E-2630 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-10553-18

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/30/18 15:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:27*	*1*

Client Sample ID: E-2631 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-10553-19

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/30/18 15:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*79*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:31*	*1*

Client Sample ID: E-2632 M0010 QC METHANOL TB

Lab Sample ID: 140-10553-20

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/30/18 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:34*	*1*

Client Sample ID: E-2633 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-10553-21

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/30/18 15:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*82*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:37*	*1*

Client Sample ID: E-2639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RINSE PB

Lab Sample ID: 140-10553-24

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	**1.55**		0.0250	0.0250	ug/Sample		01/27/18 07:35	01/31/18 11:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*115*		*50 - 200*	*01/27/18 07:35*	*01/31/18 11:33*	*1*

Client Sample ID: E-2640,2641 M0010 RUN 4 FH

Lab Sample ID: 140-10553-25

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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	**27.8**	**E**	0.0750	0.0750	ug/Sample		01/27/18 07:35	01/30/18 16:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*99*		*50 - 200*	*01/27/18 07:35*	*01/30/18 16:13*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**26.3**		1.50	1.50	ug/Sample		01/27/18 07:35	01/31/18 11:37	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*129*	*D*	*50 - 200*	*01/27/18 07:35*	*01/31/18 11:37*	*20*

Client Sample ID: E-2642,2643,2645 M0010 RUN 4 BH

Lab Sample ID: 140-10553-26

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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	132	E	0.200	0.200	ug/Sample		01/26/18 12:10	01/30/18 15:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*71*		*50 - 200*	*01/26/18 12:10*	*01/30/18 15:40*	*1*

Method: 8321A - PFOA and PFOS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	135		4.00	4.00	ug/Sample		01/26/18 12:10	01/31/18 11:14	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*	*D*	*50 - 200*	*01/26/18 12:10*	*01/31/18 11:14*	*20*

Client Sample ID: E-2644 M0010 RUN 4 COND

Lab Sample ID: 140-10553-27

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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		0.122	0.00625	ug/Sample		02/05/18 20:43	02/06/18 09:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*104*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:34*	*1*

Client Sample ID: E-2646 M0010 RUN 4 XAD-2

Lab Sample ID: 140-10553-28

Date Collected: 01/25/18 10:00
Matrix: Air
Date Received: 01/26/18 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		01/26/18 12:10	01/31/18 11:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*01/26/18 12:10*	*01/31/18 11:07*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

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: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

Method: 8321A - HFPO-DA

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

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-10553-3	E-2605 M0010 RUN 1 COND	82
140-10553-7	E-2612 M0010 RUN 2 COND	85
140-10553-11	E-2619 M0010 RUN 3 COND	81
140-10553-15	E-2626 M0010 RUN QC COND	119
140-10553-17	E-2629 M0010 QC DI WATER F	114
140-10553-27	E-2644 M0010 RUN 4 COND	104
LCS 280-403032/2-A	Lab Control Sample	113
LCS 280-403577/7-A	Lab Control Sample	86
LCSD 280-403032/9-A	Lab Control Sample Dup	113
LCSD 280-403577/8-A	Lab Control Sample Dup	87
LLCS 280-403032/10-A	Lab Control Sample	115
LLCS 280-403577/9-A	Lab Control Sample	86
MB 280-403032/1-A	Method Blank	124
MB 280-403577/6-A	Method Blank	86

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)
140-10553-1	E-2601,2602 M0010 RUN 1 FH	58
140-10553-1 - DL	E-2601,2602 M0010 RUN 1 FH	174 D
140-10553-2	E-2603,2604,2606 M0010 RUN	79
140-10553-4	E-2607 M0010 RUN 1 XAD-2	84
140-10553-5	E-2608,E-2609 M0010 RUN 2 F	21 X
140-10553-5 - DL	E-2608,E-2609 M0010 RUN 2 F	147 D
140-10553-5 - RE	E-2608,E-2609 M0010 RUN 2 F	97
140-10553-6	E-2610,2611,2613 M0010 RUN	8 X
140-10553-6 - DL2	E-2610,2611,2613 M0010 RUN	103
140-10553-6 - DL	E-2610,2611,2613 M0010 RUN	102 D
140-10553-6 - DL3	E-2610,2611,2613 M0010 RUN	119
140-10553-8	E-2614 M0010 RUN 2 XAD-2	83
140-10553-9	E-2615,2616 M0010 RUN 3 FH	57
140-10553-9 - DL	E-2615,2616 M0010 RUN 3 FH	161 D
140-10553-10	E-2617,2618,2620 M0010 RUN	81
140-10553-12	E-2621 M0010 RUN 3 XAD-2	86
140-10553-13	E-2622,2623 M0010 RUN QC F	120
140-10553-14	E-2624,2625,2627 M0010 QC B	81
140-10553-16	E-2628 M0010 RUN QC XAD-2	121
140-10553-18	E-2630 M0010 QC MEOH WITH	103
140-10553-19	E-2631 M0010 QC XAD-2 RESI	79
140-10553-20	E-2632 M0010 QC METHANOL	108
140-10553-21	E-2633 M0010 QC XAD-2 RESI	82
140-10553-24	E-2639 M0010 QC IMP GLASS\	115
140-10553-25	E-2640,2641 M0010 RUN 4 FH	99

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

Method: 8321A - PFOA and PFOS (Continued)

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

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-10553-25 - DL	E-2640,2641 M0010 RUN 4 FH	129 D
140-10553-26	E-2642,2643,2645 M0010 RUN	71
140-10553-26 - DL	E-2642,2643,2645 M0010 RUN	76 D
140-10553-28	E-2646 M0010 RUN 4 XAD-2	86
DLCK 280-390728/12	Lab Control Sample	102
LCS 280-402938/2-A	Lab Control Sample	76
LCS 280-403009/2-A	Lab Control Sample	118
MB 280-402938/1-A	Method Blank	77
MB 280-403009/1-A	Method Blank	121

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-403032/1-A
Matrix: Air
Analysis Batch: 403425

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 403032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		01/30/18 16:12	01/31/18 11:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*124*		*50 - 200*	*01/30/18 16:12*	*01/31/18 11:47*	*1*

Lab Sample ID: LCS 280-403032/2-A
Matrix: Air
Analysis Batch: 403425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403032

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.04393		ug/Sample		88	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Lab Sample ID: LCSD 280-403032/9-A
Matrix: Air
Analysis Batch: 403425

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 403032

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.04511		ug/Sample		90	50 - 150	3	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Lab Sample ID: LLCS 280-403032/10-A
Matrix: Air
Analysis Batch: 403425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403032

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.003930		ug/Sample		79	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*115*		*50 - 200*

Lab Sample ID: MB 280-403577/6-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 403577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		02/05/18 20:43	02/06/18 09:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*50 - 200*	*02/05/18 20:43*	*02/06/18 09:08*	*1*

Method: 8321A - HFPO-DA (Continued)

Lab Sample ID: LCS 280-403577/7-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.05033		ug/Sample		101	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*86*		*50 - 200*

Lab Sample ID: LCSD 280-403577/8-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.06103		ug/Sample		122	50 - 150	19	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*87*		*50 - 200*

Lab Sample ID: LLCS 280-403577/9-A
Matrix: Air
Analysis Batch: 404051

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403577

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.003739		ug/Sample		75	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*86*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-390728/12
Matrix: Air
Analysis Batch: 390728

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	0.1941		ug/L		78	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*102*		*50 - 200*

Lab Sample ID: MB 280-402938/1-A
Matrix: Air
Analysis Batch: 403265

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402938

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.200	ug/Sample		01/26/18 12:10	01/30/18 14:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*77*		*50 - 200*	*01/26/18 12:10*	*01/30/18 14:51*	*1*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: LCS 280-402938/2-A
Matrix: Air
Analysis Batch: 403265

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402938

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.523		ug/Sample		88	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*76*		*50 - 200*

Lab Sample ID: MB 280-403009/1-A
Matrix: Air
Analysis Batch: 403266

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 403009

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.0250	ug/Sample		01/27/18 07:35	01/30/18 15:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*01/27/18 07:35*	*01/30/18 15:50*	*1*

Lab Sample ID: LCS 280-403009/2-A
Matrix: Air
Analysis Batch: 403266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403009

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.4698		ug/Sample		94	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*118*		*50 - 200*

Client Sample ID: E-2601,2602 M0010 RUN 1 FH — Lab Sample ID: 140-10553-1

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 15:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	200 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A	DL	50			403424	01/31/18 11:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2603,2604,2606 M0010 RUN 1 BH — Lab Sample ID: 140-10553-2

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 14:58	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2605 M0010 RUN 1 COND — Lab Sample ID: 140-10553-3

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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			0.0002 Sample	5 mL	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 12:00	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2607 M0010 RUN 1 XAD-2 — Lab Sample ID: 140-10553-4

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:01	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2608,E-2609 M0010 RUN 2 FH — Lab Sample ID: 140-10553-5

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	150 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 16:00	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2608,E-2609 M0010 RUN 2 FH

Lab Sample ID: 140-10553-5

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	DL		1 Sample	150 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A	DL	50			403424	01/31/18 11:24	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	RE		0.00067 Sample	50 mL	403598	02/01/18 14:36		TAL DEN
Total/NA	Analysis	8321A	RE	1			403903	02/05/18 12:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2610,2611,2613 M0010 RUN 2 BH

Lab Sample ID: 140-10553-6

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL2		0.00025 Sample	50 mL	403033	01/28/18 09:20		TAL DEN
Total/NA	Analysis	8321A	DL2	1			403405	01/31/18 09:43	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	400 mL	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A	DL	50			403423	01/31/18 11:11	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL3		0.00025 Sample	50 mL	403033	01/28/18 09:20		TAL DEN
Total/NA	Analysis	8321A	DL3	10			403424	01/31/18 11:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2612 M0010 RUN 2 COND

Lab Sample ID: 140-10553-7

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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			0.0198 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:28	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-10553-8

Date Collected: 01/24/18 10:00
Matrix: Air
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN

Client Sample ID: E-2614 M0010 RUN 2 XAD-2

Lab Sample ID: 140-10553-8
Matrix: Air
Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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			403423	01/31/18 10:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2615,2616 M0010 RUN 3 FH

Lab Sample ID: 140-10553-9
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 16:03	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	200 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A	DL	50			403424	01/31/18 11:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2617,2618,2620 M0010 RUN 3 BH

Lab Sample ID: 140-10553-10
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403423	01/31/18 10:54	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2619 M0010 RUN 3 COND

Lab Sample ID: 140-10553-11
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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			0.0202 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2621 M0010 RUN 3 XAD-2

Lab Sample ID: 140-10553-12
Matrix: Air
Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403423	01/31/18 10:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2622,2623 M0010 RUN QC FH BT — Lab Sample ID: 140-10553-13

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	100 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403424	01/31/18 11:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2624,2625,2627 M0010 QC BH — Lab Sample ID: 140-10553-14

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403423	01/31/18 11:01	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2626 M0010 RUN QC COND BT — Lab Sample ID: 140-10553-15

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 12:10	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2628 M0010 RUN QC XAD-2 BT — Lab Sample ID: 140-10553-16

Date Collected: 01/24/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403423	01/31/18 11:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2629 M0010 QC DI WATER RB — Lab Sample ID: 140-10553-17

Date Collected: 01/25/18 10:00 — **Matrix: Air**
Date Received: 01/26/18 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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 12:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2630 M0010 QC MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-10553-18

Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2631 M0010 QC XAD-2 RESIN TUBE RB

Lab Sample ID: 140-10553-19

Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:31	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2632 M0010 QC METHANOL TB

Lab Sample ID: 140-10553-20

Date Collected: 01/25/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2633 M0010 QC XAD-2 RESIN TUBE TB

Lab Sample ID: 140-10553-21

Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:37	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2639 M0010 QC IMP GLASSWARE MEOH / 5% NH4OH RINSE PB

Lab Sample ID: 140-10553-24

Date Collected: 01/24/18 10:00
Date Received: 01/26/18 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	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403424	01/31/18 11:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2640,2641 M0010 RUN 4 FH

Lab Sample ID: 140-10553-25

Date Collected: 01/25/18 10:00

Matrix: Air

Date Received: 01/26/18 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	150 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 16:13	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	150 mL	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A	DL	20			403424	01/31/18 11:37	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2642,2643,2645 M0010 RUN 4 BH

Lab Sample ID: 140-10553-26

Date Collected: 01/25/18 10:00

Matrix: Air

Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 15:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									
Total/NA	Prep	None	DL		1 Sample	400 mL	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A	DL	20			403423	01/31/18 11:14	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2644 M0010 RUN 4 COND

Lab Sample ID: 140-10553-27

Date Collected: 01/25/18 10:00

Matrix: Air

Date Received: 01/26/18 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			0.02041 Sample	5 mL	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2646 M0010 RUN 4 XAD-2

Lab Sample ID: 140-10553-28

Date Collected: 01/25/18 10:00

Matrix: Air

Date Received: 01/26/18 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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403423	01/31/18 11:07	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-402938/1-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	402938	01/26/18 12:10		TAL DEN

Client Sample ID: Method Blank
Lab Sample ID: MB 280-402938/1-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	Analysis	8321A		1			403265	01/30/18 14:51	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-403009/1-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	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 15:50	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-403032/1-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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 11:47	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-403577/6-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-390728/12

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			390728	10/10/17 10:04	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-402938/2-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	402938	01/26/18 12:10		TAL DEN
Total/NA	Analysis	8321A		1			403265	01/30/18 14:55	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-403009/2-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	403009	01/27/18 07:35		TAL DEN
Total/NA	Analysis	8321A		1			403266	01/30/18 15:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-403032/2-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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 11:50	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-403577/7-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-403032/9-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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 11:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 280-403577/8-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:15	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample

Lab Sample ID: LLCS 280-403032/10-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	403032	01/30/18 16:12	SKM	TAL DEN
Total/NA	Analysis	8321A		1			403425	01/31/18 11:56	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample

Lab Sample ID: LLCS 280-403577/9-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	403577	02/05/18 20:43	CDC	TAL DEN
Total/NA	Analysis	8321A		1			404051	02/06/18 09:18	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: PPA Stack Emissions Test

TestAmerica Job ID: 140-10553-1

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	02-28-18
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	04-13-18
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	03-31-18
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		P330-13-00262	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	04-05-18
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	04-01-18
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.: 140-10553-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 390728

Lab Sample ID: STD001 280-390728/3 IC Client Sample ID:

Date Analyzed: 10/10/17 09:35 Lab File ID: hfpo717J10026.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.89	Baseline	meyera	10/10/17 11:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10553-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403265

Lab Sample ID: 140-10553-6 Client Sample ID: E-2610,2611,2613 M0010 RUN 2 BH

Date Analyzed: 01/30/18 15:04 Lab File ID: hfpo718A30060.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.06	Baseline	meyera	01/31/18 08:38

Lab Sample ID: 140-10553-20 Client Sample ID: E-2632 M0010 QC METHANOL TB

Date Analyzed: 01/30/18 15:34 Lab File ID: hfpo718A30069.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	1.03	Assign Peak	meyera	01/31/18 08:38

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10553-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403423

Lab Sample ID: 140-10553-12 Client Sample ID: E-2621 M0010 RUN 3 XAD-2

Date Analyzed: 01/31/18 10:57 Lab File ID: hfpo718A31031.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA		Invalid Compound ID	meyera	01/31/18 14:51

Lab Sample ID: 140-10553-28 Client Sample ID: E-2646 M0010 RUN 4 XAD-2

Date Analyzed: 01/31/18 11:07 Lab File ID: hfpo718A31034.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA		Invalid Compound ID	meyera	01/31/18 14:51

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10553-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 403425

Lab Sample ID: LLCS 280-403032/10-A Client Sample ID:

Date Analyzed: 01/31/18 11:56 Lab File ID: hfpo718A31049.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.95	Baseline	meyera	01/31/18 14:52

8321A

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 140-10553-1

SDG No.:

Instrument ID: LC_LCMS7 Analysis Batch Number: 404051

Lab Sample ID: 140-10553-27 Client Sample ID: E-2644 M0010 RUN 4 COND

Date Analyzed: 02/06/18 09:34 Lab File ID: hfpo718B06012.d GC Column: Synergi Hydro ID:

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
HFPO-DA	0.93	Assign Peak	meyera	02/06/18 13:05

8321A

APPENDIX D
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS FOR
FLOW, MOISTURE AND ISO

Client: Chemours
Test Number: Run 1
Test Location: PPA Stack

Plant: Fayetteville, NC
Test Date: 1/24/18
Test Period: 1152-1348

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{\text{delta H}}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 0.9934 \times 50.307 \times \left(30.14 + \frac{0.941}{13.6} \right)}{61.13 + 460} = 51.103$$

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 x Vwc) + (0.04715 x Wwsg)

Vw(std) = (0.04707 x 15.0) + (0.04715 x 11.2) = 1.234

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

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{1.234}{1.234 + 51.103} = 0.024$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$Md = 1 - bws$$

$$Md = 1 - 0.024 = 0.976$$

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.

$$MWs = (MWd \times Md) + (18 \times (1 - Md))$$

$$MWs = (28.84 \times 0.976) +(18 (1 - 0.976)) = 28.58$$

Where:

MWs = Molecular weight of wet gas, lb/lb-mole.
18 = Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs}\right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 0.783330 \times \left(\frac{529}{30.37 \times 28.58}\right)^{\wedge 1/2} = 43.9$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec x $\frac{(\text{lb/lb-mole})(\text{in. Hg})^{1/2}}{(\text{deg R})(\text{in } H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = Pb + $\frac{P(\text{static})}{13.6}$

delta p = Velocity head of stack, in. H_2O

8. Average gas stream volumetric flowrate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 43.92 \times 4.90 = 12913$$

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.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.976 \times \frac{30.37}{529} \times 12913$$

$$= 12764$$

Where:

Qs(std) = Volumetric flowrate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 529 \times 51.103}{43.92 \times 96 \times 30.37 \times 0.976 \times (0.191)^{\wedge}2} = 102.7$$

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), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

SAMPLE CALCULATIONS FOR HFPO DIMER ACID (METHOD 0010)

Client: Chemours
Test Number: Run 1
Test Location: PPA

Plant: Fayetteville, NC
Test Date: 1-24-18
Test Period: 1152-1348

1. HFPO Dimer Acid concentration, lbs/dscf.

$$C_1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$C_1 = \frac{782.0 \times 2.2046 \times 10\text{-}9}{51.103}$$

$$= 3.37E\text{-}08$$

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.

$C_2 = W / (Vm(std) \times 0.02832)$

$C_2 = 782.0 / (51.103 \times 0.02832)$

$= 5.40E+02$

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 = 3.37E-08 x 12764 x 60

= 2.58E-02

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 = 2.58E-02 x 453.59 /3600

= 3.25E-03

Where:

PMR2 = HFPO Dimer Acid mass emission rate, g/sec.

454 = Conversion factor from pounds to grams.

= Conversion factor from hours to seconds.

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator MDW | Meter Box Number 25 | Ambient Temp 72

Date 23-Feb-17 | Wet Test Meter Number P-2952 | Temp Reference Source Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 16300943

Baro Press, in Hg (Pb)	29.6

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	152.255	71.0	72.00	72.00	72.5	13.1	0.9936	1.9463
		157.295		73.00	73.00				
		5.040		72.50	72.50				
1.0	5.0	158.290	71.0	73.00	73.00	73.5	9.2	1.0050	1.9163
		163.276		74.00	74.00				
		4.986		73.50	73.50				
1.5	10.0	164.265	71.0	74.00	74.00	74.5	15.3	1.0062	1.9837
		174.232		75.00	75.00				
		9.967		74.50	74.50				
2.0	10.0	175.200	70.0	71.00	71.00	72.0	13.3	1.0074	2.0005
		185.115		73.00	73.00				
		9.915		72.00	72.00				
3.0	10.0	187.070	70.0	73.00	73.00	74.5	10.6	1.0101	1.8972
		196.980		74.00	78.00				
		9.910		73.50	75.50				
							Average	1.0045	1.9488

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

O - 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	212	212	212	212		212.0	0.0%
932	932	932	932	932	932		932.0	0.0%
1832	1830	1830	1830	1830	1830		1830.0	0.1%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(°F) + 460) - (\text{Test Temp}(°F) + 460)}{\text{Reference Temp}(°F) + 460}\right]$$

Post Test Calibration

Calibrator PM

Date 1/30/18

Meter Box Number 25

Wet Test Meter Number P-2952

Dry Gas Meter Number 16300943

Client Chemours

Location/Plant Fayetteville, NC

PreTest Y 1.0045

Baro Press, in Hg (Pb)	29.74

Setting	Gas Volume		Temperatures					
Orifice Manometer	Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter				
in H_2O (I)	ft^3 (Vw)	ft^3 (Vd)	°F (Tw)	Outlet, °F (Td_o)	Inlet, °F (Td_i)	Average, °F (Td)	Time, min (O)	Y
0.70	5.0	111.551 116.797 5.246	69.0	69.00	70.00	69.5	11.0	0.9524
.70	5.0	116.797 122.050 5.253	69.0	70.00	71.00	70.5	11.0	0.9529
0.70	5.0	122.050 127.288 5.238	69.0	71.00	72.00	71.5	11.0	0.9574
							Average	**0.9542**
							Difference[1]	**0.0503**

use this value for emission calcs

1 - Tolerance for Y is less than 0.0500

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

O - Time of calibration run
Pb - Barometric Pressure
ΔH - Pressure differential across orifice
Y - Ratio of accuracy of wet test meter to dry gas meter

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6}\right] * (tw + 460)}$$

Long Calibration Required

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator PM | Meter Box Number 29 | Ambient Temp 71

Date 20-Jan-18 | Wet Test Meter Number P-2952 | Temp Reference Source Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 17176777

Baro Press, in Hg (Pb)	30.03

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	739.961	70.0	67.00	67.00	68.0	13.0	0.9968	1.8982
		744.952		69.00	69.00				
		4.991		68.00	68.00				
1.0	10.0	744.952	70.0	70.00	70.00	71.5	18.40	0.9983	1.8888
		754.973		73.00	73.00				
		10.021		71.50	71.50				
1.5	11.0	754.973	70.0	73.00	73.00	74.0	17.3	0.9905	2.0602
		766.121		75.00	75.00				
		11.148		74.00	74.00				
2.0	10.1	766.121	70.0	75.00	75.00	76.0	13.6	0.9924	2.0061
		776.363		77.00	77.00				
		10.242		76.00	76.00				
3.0	10.4	776.363	70.0	77.00	77.00	78.0	11.5	0.9889	2.0217
		786.961		79.00	79.00				
		10.598		78.00	78.00				
							Average	0.9934	1.9750

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

O - 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	213	213	213	213	213		213.0	-0.1%
932	933	933	933	933	933		933.0	-0.1%
1832	1831	1831	1831	1831	1831		1831.0	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

Method 0010
METER BOX NO. 29
1/24-25/18

	Run 1	Run 2	Run 3	Run 4
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	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	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	28.84

Tma = Source Temperature, absolute(°R)				
Tm = Average dry gas meter temperature , deg F.	61.1	74.3	43.6	51.8

$$Tma = Ts + 460$$

$$Tma = 61.10 + 460$$

Tma =	521.10	534.30	503.60	511.80

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	0.941	0.946	0.895	0.599
Pb = Barometric Pressure, in Hg.	30.14	30.14	30.42	30.47

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.14 + (0.94125 / 13.6)$$

Pm =	30.21	30.21	30.49	30.51

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.	50.307	50.838	47.135	40.424
Y = Dry gas meter calibration factor (based on full calibration)	0.9934	0.9934	0.9934	0.9934
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	1.9750	1.9750	1.9750	1.9750
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	0.9603	0.9626	0.9342	0.7711
O = Total sampling time, minutes.	96	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 50.31) * SQRT (0.0319 * 521.10 * 29) / (1.98 * 30.21 * 28.84) * 0.96$$

$$Yqa = 1.908 * SQRT\ 482.070 / 1{,}720.493 * 0.96$$

Yqa =	0.970	0.974	0.986	0.956

Diff = Absolute difference between Yqa and Y				

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((0.9934 - 0.970) / 0.9934) * 100$$

Diff =	**2.36**	**1.95**	**0.74**	**3.76**

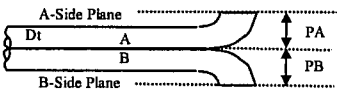
Average Diff = 2.20
Allowable = 5.0

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-563**

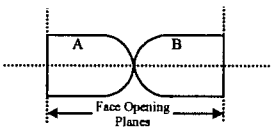
Inspection Date 2/19/18 Individual Conducting Inspection KS

If all Criteria PASS Cp is equal to 0.84

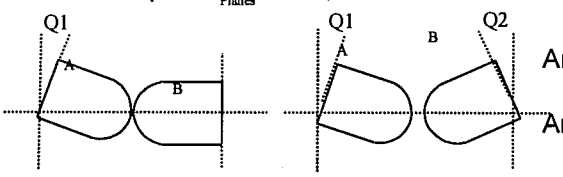


		PASS/FAIL
Distance to A Plane (PA) - inches	0.469	PASS
Distance to B Plane (PB) - inches	0.469	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

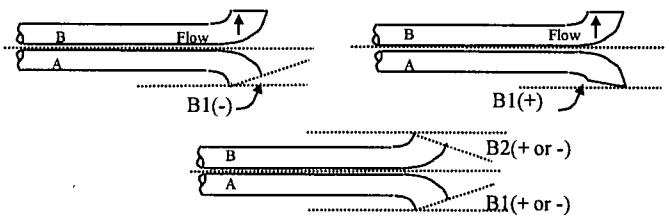


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



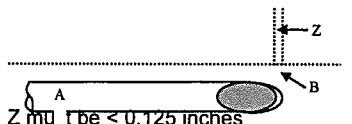
		PASS/FAIL
Angle of Q1 from vertical A Tube- degrees (absolute)	1	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	1	PASS

Q1 and Q2 must be ≤ 10°



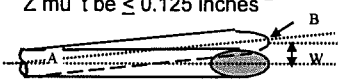
		PASS/FAIL
Angle of B1 from vertical A Tube- degrees (absolute)	2	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	1	PASS

B1 or B2 must be ≤ 5°



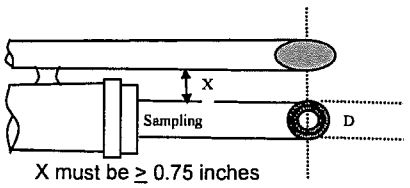
Z must be ≤ 0.125 inches

		PASS/FAIL
Horizontal offset between A and B Tubes (Z) - inches	0.006	PASS



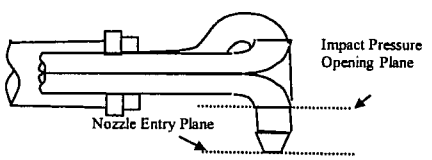
W must be ≤ 0.03125 inches

		PASS/FAIL
Vertical offset between A and B Tubes (W) - inches	0.012	PASS

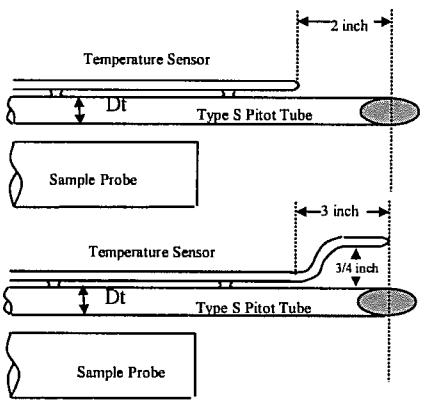


X must be ≥ 0.75 inches

		PASS/FAIL
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

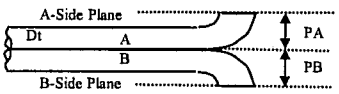
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-695**

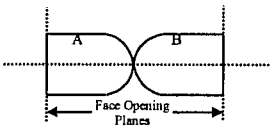
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS Cp is equal to 0.84

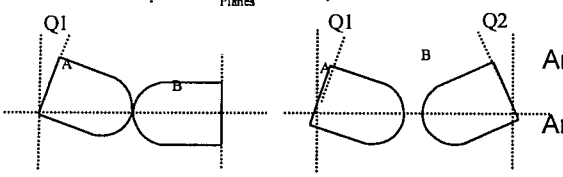
		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	



$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB



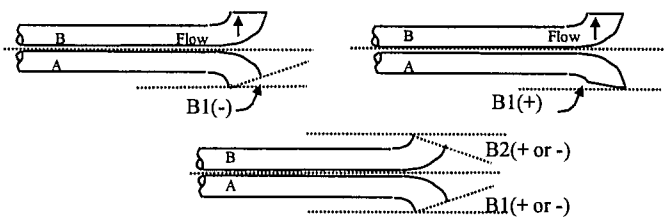
Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



Angle of Q1 from vertical A Tube- degrees (absolute) 0 PASS

Angle of Q2 from vertical B Tube- degrees (absolute) 1 PASS

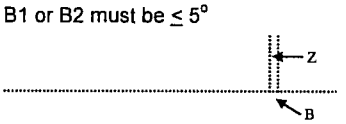
Q1 and Q2 must be ≤ 10°



Angle of B1 from vertical A Tube- degrees (absolute) 0 PASS

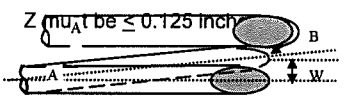
Angle of B1 from vertical B Tube- degrees (absolute) 0 PASS

B1 or B2 must be ≤ 5°



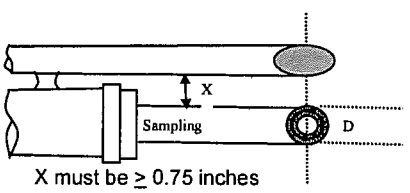
Horizontal offset between A and B Tubes (Z) - inches 0.006 PASS

Z must be ≤ 0.125 inch



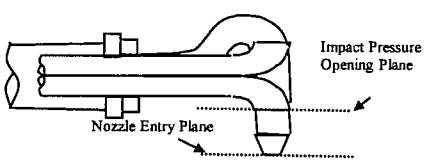
Vertical offset between A and B Tubes (W) - inches 0.018 PASS

W must be ≤ 0.03125 inches

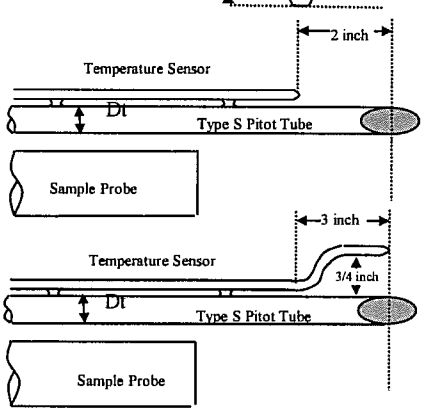


Distance between Sample Nozzle and Pitot (X) - inches 0.78 PASS

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

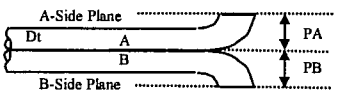
Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-696**

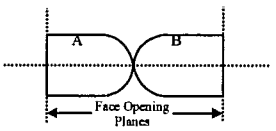
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS Cp is equal to 0.84

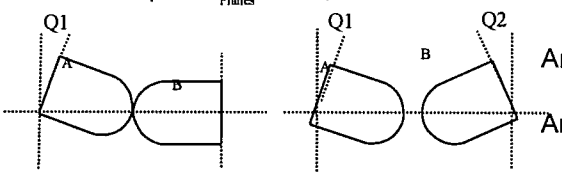


		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

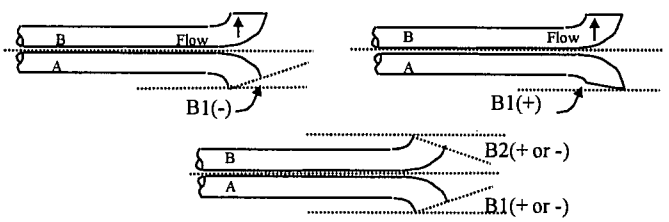


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



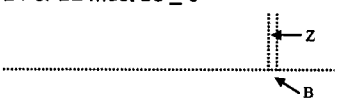
Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be ≤ 10°



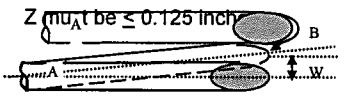
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°



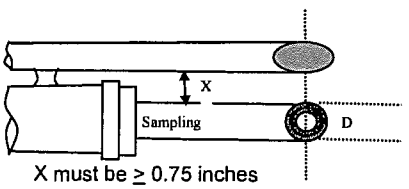
Horizontal offset between A and B Tubes (Z) - inches	0.005	PASS

Z must be ≤ 0.125 inch



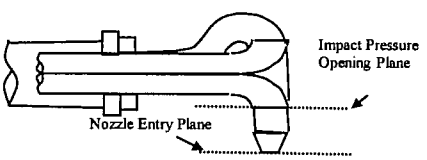
Vertical offset between A and B Tubes (W) - inches	0.014	PASS

W must be ≤ 0.03125 inches

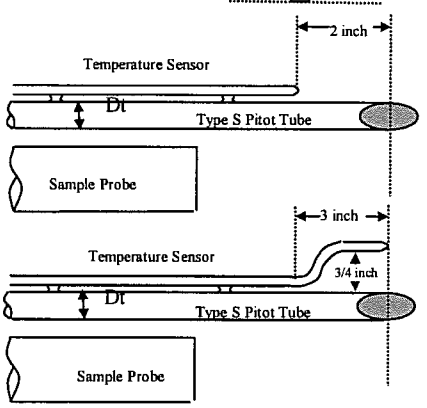


Distance between Sample Nozzle and Pitot (X) - inches	0.8	PASS

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

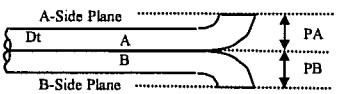
Thermocouple meets the Distance Criteria in the adjacent figure: ○ YES ○ NO ◉ NA

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-697**

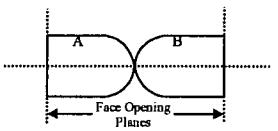
Inspection Date 1/5/18 Individual Conducting Inspection PM

If all Criteria PASS
Cp is equal to 0.84

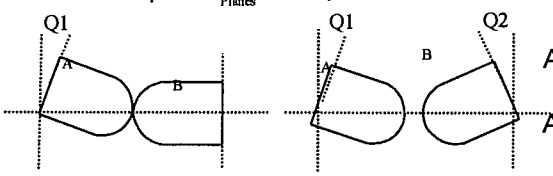


		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

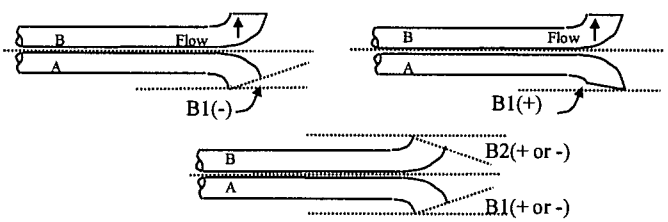


Are Open Faces Aligned Perpendicular to the Tube Axis: ◉ YES ○ NO — PASS



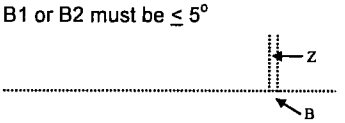
Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be ≤ 10°



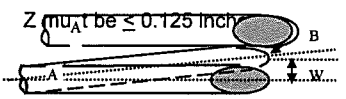
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°



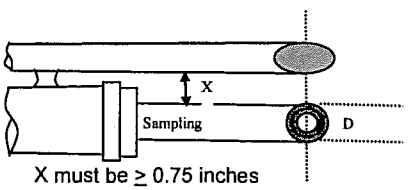
Horizontal offset between A and B Tubes (Z) - inches	0.007	PASS

Z must be ≤ 0.125 inch



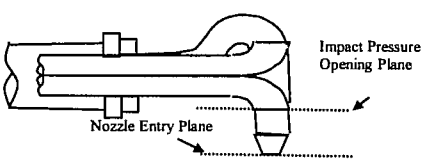
Vertical offset between A and B Tubes (W) - inches	0.018	PASS

W must be ≤ 0.03125 inches

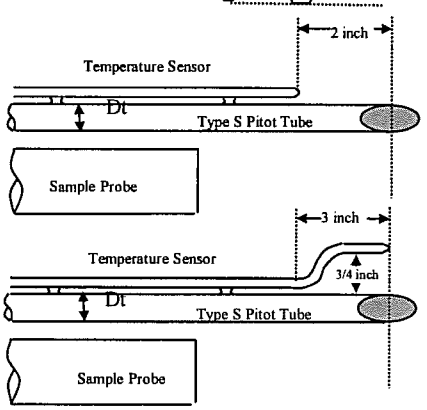


Distance between Sample Nozzle and Pitot (X) - inches	0.8	PASS

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

NOZZLE CALIBRATION DATA FORM

Date: 1/22/18 **Calibrated by:** PM

Nozzle Identification Number	Nozzle Diameter, Inches[1]			ΔD,[2]	D_{avg}[3]
	D_1	D_2	D_3		
G151	.150	.151	.151	.001	0.151
G 191	.191	.191	.191	.000	0.191
G 180	.180	.181	.180	.001	0.180

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.

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:	82-124627728-1
Cylinder Number:	CC62094	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:	Jul 10, 2017

Expiration Date: Jul 10, 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 %	8.911 %	G1	+/- 0.7% NIST Traceable	07/10/2017
OXYGEN	12.00 %	12.00 %	G1	+/- 0.5% NIST Traceable	07/10/2017
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	Jun 30, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Jul 07, 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:	82-124577574-1
Cylinder Number:	CC349225	Cylinder Volume:	157.2 CF
Laboratory:	124 - Riverton - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Sep 24, 2016

Expiration Date: Sep 24, 2024

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 %	16.75 %	G1	+/- 0.7% NIST Traceable	09/24/2016
OXYGEN	21.00 %	21.01 %	G1	+/- 0.3% NIST Traceable	09/24/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060609	CC413575	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 09, 2019
NTRMplus	12062004	CC367411	22.883 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-LDH9LRNS	NDIR	Sep 09, 2016
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Sep 08, 2016

Triad Data Available Upon Request

Signature on file
Approved for Release

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