MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

RECEIVED

JUN 12 2017

DEQ - RRD
SAGINAW BAY DISTRICT

TO: Mike Jury, Project Manager, Saginaw Bay District Office
Remediation and Redevelopment Division

FROM: Jeff Pincumbe, Geologist, Geological Services Unit
Program Support Section, Remediation and Redevelopment Division

DATE: June 6, 2017

SUBJECT: Loud Drive PCE, Iosco County, Site ID #35000152
Site Investigation-Phase 2

This report is for Phase 2 Site Investigation work requested by the Department of Environmental Quality (DEQ), Remediation and Redevelopment Division's (RRD's), Saginaw Bay District office for the subject site (Fig 1). The site is one of three sites associated with Wurtsmith Air Force Base that have been or have the potential to be impacted with Perfluorinated Hydrocarbons (PFCs). The other two sites associated with Wurtsmith are the F-41/Colbath Road site and the River Road Site. Both of these sites are included on Figure 1. The initial phase of work was completed in October 2016 and consisted of the completion of soil borings at 8 locations and the installation of 4 monitor wells at 4 additional locations with vertical aquifer sampling at each location. The results of the initial investigation were summarized in a January 5, 2017, report. Phase 2 consisted of completing 2 soil borings with vertical aquifer sampling, the collection of a surface water sample from Van Etten Lake, and the sampling of existing monitor well MW-3. RRD's Geological Services Unit (GSU) staff conducted the fieldwork on March 22, 2017 and May 9, 2017. GSU received the final laboratory results on May 31, 2017.

The site is located between Van Etten Lake to the west and Lake Huron to the east. This is a residential area where the majority of homes use private wells for their water supply. Ongoing environmental work associated with the air force base has determined that PFCs are migrating from the base towards, and have impacted, Van Etten Lake. This phase of the investigation was to help in determining if PFCs were migrating beneath Van Etten Lake.

The PFCs includes a list of 21 compounds with only 2 being compounds of concern: Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). The action level for the compounds of concern is 70 parts per trillion (ng/l) for each compound or for a total of the 2 compound added together.

This report includes the following:

- Site Location Map (Fig 1)
- Site Map (Fig 2)
- Volatile Organic Compounds (VOCs) Laboratory Table with Comparison to Risk-Based Screening Levels (RBSLs) (Table 1)
- PFC Compounds of Concern Laboratory Table with Comparison to Action Levels (Table 2)
- DEQ Soil Boring Logs (Appendix A)
- DEQ Laboratory Results (Appendix B)
- Test America Laboratory Results (Appendix C)

During the winter months the water level in Van Etten Lake is lowered resulting in a large area of lake-bottom being exposed on the east side of the lake. This allowed for the completion of 2 soil borings located between 250 feet and 300 feet out into the lake bed from the eastern shore line.

On March 22, 2017, GSU completed soil borings B-9 and B-10 (Fig 2) (Appendix A). The soil borings were completed using a Geoprobe. Soil samples were collected from B-9 to a depth of 17 feet using a dual tube system with a 3.25-inch outer rod. The soil samples were for determining lithology only. The 3.25-inch rods were then driven to a depth of 45 feet and a gamma log was run to identify any changes in lithology with depth. The gamma log for B-9 is included on the Soil Boring Log. The gamma log did indicate that a confining layer may be present at a depth of approximately 33 feet.

Vertical aquifer sampling (VAS) was completed at both B-9 and B-10. VAS was done by driving 1.25-inch Geoprobe rods with a mill slotted lead. Groundwater samples were collected from the depth shown on the boring log using a peristaltic pump. The samples were submitted to the DEQ Laboratory and analyzed for VOCs using USEPA Method 8260 (Table 1) (Appendix B). Duplicate groundwater samples were submitted to Test America and analyzed for PFCs (Table 2) (Appendix C).

On March 23, 2017, a surface water sample was collected from the east side of Van Etten Lake from the location identified as Lake Sample on Figure 2. This sample was submitted to Test America and analyzed for PFCs (Table 2) (Appendix C).

On May 9, 2017, a groundwater sample was collected from monitor well MW-3. The sampling was conducted using a low-flow method. The sample was submitted to the DEQ Laboratory and analyzed for VOCs using USEP Method 8260 (Table 1) (Appendix B). A duplicate groundwater sample was submitted to Test America and analyzed for PFCs (Table 2) (Appendix C).

A review of the VOC results indicated that there were no detectable concentrations of VOCs in the samples from B-9, B-10, and MW-3.

The PFC compounds were detected in the majority of the groundwater samples collected from the Loud Drive area and from Van Etten Lake. However, all of the concentrations were below the action level of 70 ng/l. The highest PFC concentration (4.3 ng/l) was detected in the surface water sample from Van Etten Lake.

If you have any questions, contact me at 517-243-3171.

Attachments

cc: Burrell P. Shirey, DEQ

LEGEND

Soil Boring / Monitor Well

- DATUM - NAD83
- PROJECTION: MICHIGAN GEOREF
- NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: MI CENTER FOR SHARED SOLUTIONS
AERIAL PHOTO DATE: NA
AERIAL RESOLUTION: USGS Topographic

N W E S

0 185 370 740 Meters

0 650 1,300 2,600 Feet

1 inch = 2,667 feet

Wurtsmith Air Force Base
ERNIE ID 53000152, 53000153, 53000154
OSCODA & AU SABLE TOWNSHIPS, IOSCO COUNTY

SITE LOCATIONS MAP

GEOLOGIST		CREATION DATE
Jeff Pincumbe Geological Services Unit		January 2017
Remediation and Redevelopment Division	DEQ	FIGURE 1

LEGEND

- Soil Boring / Monitor Well
- Lake Sample

- DATUM - NAD83
- PROJECTION: MICHIGAN GEOREF
- NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: MI CENTER FOR SHARED SOLUTIONS
AERIAL PHOTO DATE: 2010
AERIAL RESOLUTION: 1 foot Natural Color

N W E S

0 65 130 260 Meters

0 250 500 1,000 Feet

1 inch = 1,000 feet

Wurtsmith - Loud Drive
ERNIE ID # 35000152
OSCODA TOWNSHIP, IOSCO COUNTY
T24N R9E SECTIONS 21, 22 & 27

SITE MAP

GEOLOGIST		CREATION DATE
Jeff Pincumbe Geological Services Unit		January 2017
Remediation and Redevelopment Division	DEQ	FIGURE 2

Michigan Department of Environmental Quality Analytical Testing Report

Table #1
(Page 1 of 1)

Work Order: 1703145 and 1705098
Report Date: 4/3/2017 and 5/31/2017
Client: MDEQ-RRD-SAGINAW BAY
Attention: Mike Jury
Project Name: LOUD DRIVE PCE, IOSCO CO.
Project Number: 35000152

Sample Number			Target Detection Limit (TDL)	Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC)	Rule 57 Final Acute Value (FAV)	1703145-01	1703145-02	1703145-03	1703145-04	1703145-05	1703145-06	1705098-01
Sample ID								LD-B-9	LD-B-9	LD-B-9	LD-B-10	LD-B-10	LD-B-10	LD-MW-3
Sample Depth								4-9 feet	14-19 feet	24-29 feet	4-9 feet	14-19 feet	22-29 feet	
Date Collected								3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	5/9/2017
Date Received								3/24/2017	3/24/2017	3/24/2017	3/24/2017	3/24/2017	3/24/2017	5/10/2017
Analyte	Units	Method	Organics-Volatiles											
1,1,1,2-Tetrachloroethane	ug/L	8260	1	77	ID	15,000	ID	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/L	8260	1	200	89	660,000	1,600	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/L	8260	1	9	78	12,000	1,800	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/L	8260	1	5	330	17,000	6,400	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	ug/L	8260	1	880	740	1,000,000	13,000	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	ug/L	8260	1	7	130	200	2,300	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	ug/L	8260	1	42	NA	8,300	NA	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trimethylbenzene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	ug/L	8260	5	70	99	300,000	850	<5	<5	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	ug/L	8260	1	63	17	56,000	310	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5	NA
1,2-Dibromoethane	ug/L	8260	0	0	6	2,400	280	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	ug/L	8260	1	600	13	160,000	240	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	8260	1	5	360	9,600	16,000	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/L	8260	1	5	230	16,000	4,000	<1	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	ug/L	8260	1	72	45	61,000	810	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	8260	1	7	28	18,000	200	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	8260	1	75	17	16,000	210	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	ug/L	8260	25	13,000	2,200	240,000,000	40,000	<5	<5	<5	<5	<5	<5	<1
2-Hexanone	ug/L	8260	50	1,000	ID	4,200,000	ID	<5	<5	<5	<5	<5	<5	<5
2-Methylnaphthalene	ug/L	8260	5	260	19	25,000	340	<5	<5	<5	<5	<5	<5	<5
2-Propanone (acetone)	ug/L	8260	50	730	1,700	1,000,000,000	30,000	<20	<20	<20	<20	<20	<20	<20
4-Methyl-2-pentanone (MIBK)	ug/L	8260	50	1,800	ID	20,000,000	ID	<5	<5	<5	<5	<5	<5	<5
Acrylonitrile	ug/L	8260	2	3	2	34,000	1,200	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/L	8260	1	5	200	5,600	1,900	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	ug/L	8260	1	18	NA	180,000	NA	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	ug/L	8260	1	80	ID	4,800	ID	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/L	8260	1	80	ID	470,000	ID	<1	<1	<1	<1	<1	<1	<1
Bromomethane	ug/L	8260	5	10	35	4,000	640	<5	<5	<5	<5	<5	<5	<5
Carbon disulfide	ug/L	8260	5	800	ID	250,000	ID	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/L	8260	1	5	45	370	1,400	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/L	8260	1	100	25	210,000	450	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/L	8260	5	430	1,100	5,700,000	20,000	<5	<5	<5	<5	<5	<5	<5
Chloroform	ug/L	8260	1	80	350	28,000	11,000	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/L	8260	5	260	ID	8,600	ID	<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethylene	ug/L	8260	1	70	620	93,000	11,000	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane	ug/L	8260	5	80	ID	14,000	ID	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/L	8260	5	80	NA	ID	NA	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	ug/L	8260	5	1,700	ID	220,000	ID	<5	<5	<5	<5	<5	<5	<5
Diethyl ether	ug/L	8260	10	10	ID	61,000,000	ID	<5	<5	<5	<5	<5	<5	<5
Diisopropyl Ether	ug/L	8260	5	30	ID	8,000	ID	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/L	8260	1	74	18	110,000	320	<1	<1	<1	<1	<1	<1	<1
Ethyltertiarybutylether	ug/L	8260	5	49	ID	2,900,000	ID	<5	<5	<5	<5	<5	<5	<5
Hexachloroethane	ug/L	8260	5	7	7	27,000	210	<5	<5	<5	<5	<5	<5	<5
Isopropylbenzene	ug/L	8260	5	800	28	56,000	500	<1	<1	<1	<1	<1	<1	<1
m & p - Xylene	ug/L	8260	NA	NA	NA	NA	NA	<2	<2	<2	<2	<2	<2	<1
Methyl iodide	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<2
Methylene chloride	ug/L	8260	5	5	1,500	220,000	17,000	<5	<5	<5	<5	<5	<5	<5
Methyltertiarybutylether	ug/L	8260	5	40	7,100	47,000,000	420,000	<1	<1	<1	<1	<1	<1	<1
Naphthalene	ug/L	8260	5	520	11	31,000	200	<5	<5	<5	<5	<5	<5	<5
n-Butylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1	<1
n-Propylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1	<1
o-Xylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<1
p-Isopropyl toluene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	NA
sec-Butylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/L	8260	1	100	80	170,000	2,900	<1	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1	<1
tertiary Butyl Alcohol	ug/L	8260	50	3,900	NA	1,000,000,000	NA	<50	<50	<50	<50	<50	<50	<50
tertiaryAmylmethylether	ug/L	8260	5	190	NA	260,000	NA	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/L	8260	1	5	60	25,000	2,900	<1	<1	<1	<1	<1	<1	<1
Tetrahydrofuran	ug/L	8260	90	95	11,000	6,900,000	150,000	<5	<5	<5	<5	<5	<5	<5
Toluene	ug/L	8260	1	790	270	530,000	2,600	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethylene	ug/L	8260	1	100	1,500	85,000	28,000	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-butene	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5	NA
Trichloroethylene	ug/L	8260	1	5	200	2,200	3,500	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/L	8260	1	2,600	NA	1,100,000	NA	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/L	8260	1	2	13	1,100	17,000	<1	<1	<1	<1	<1	<1	<1

Grey indicates contaminant was detected.
Yellow indicates contaminant exceeds DWC.
Blue indicates contaminant exceeds GSIC.
Green indicates contaminant exceeds both DWC and GSIC.
Orange indicates contaminant exceeds one or more criteria; GVIIC and/or FAV.
"ID" means insufficient data to develop criterion.
"NA" means a criterion or value is not available or, in the case of background, not applicable.
"NLV" means hazardous substance is not likely to volatilize under most conditions.
Letters in criteria columns refer to Footnotes of the Criteria/RBSLs tables.

Testing America Analytical Testing Report

Table #2
(Page 1 of 1)

Test America Job IDs 320-26905-1, 320-79502-1
Report Date: 4/17/2017, 5/31/2017
Client: MDEQ-RRD-SAGINAW BAY
Attention: Mike Jury
Project Name: LOUD DRIVE PCE, IOSCO CO.
Project Number: 35000152

Location				B-9	B-9	B-9	B-10	B-10	B-10	Van Etten Lake SW	MW-3
Depth				4-9 ft	14-19 ft	24-29 ft	4-9 ft	14-19 ft	24-19 ft		
Date				3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/23/2017	5/9/2017
	Action Level										
Perfluorooctanoic Acid (PFOA)	70 ng/l			**0.88**	**0.79**	**1.6**	**0.95**	ND	**0.94**	**1.7**	**3**
Perfluorooctane Sulfonate (PFOS)	70ng/l			ND	ND	ND	ND	ND	ND	**2.6**	ND
Total PFOA and PFOS	70 ng/l			**0.88**	**0.79**	**1.6**	**0.95**	ND	**0.94**	**4.3**	**3**

Grey indicates contaminant was detected.

ND = Non Detect

APPENDIX A

Loud Drive PCE, Iosco County
Site ID #35000152

DEQ Soil Boring Logs

Remediation and Redevelopment Division

GEOPHYSICAL LOG

BORING/WELL: LD-B9

SITE: Wurtsmith - Loud Drive

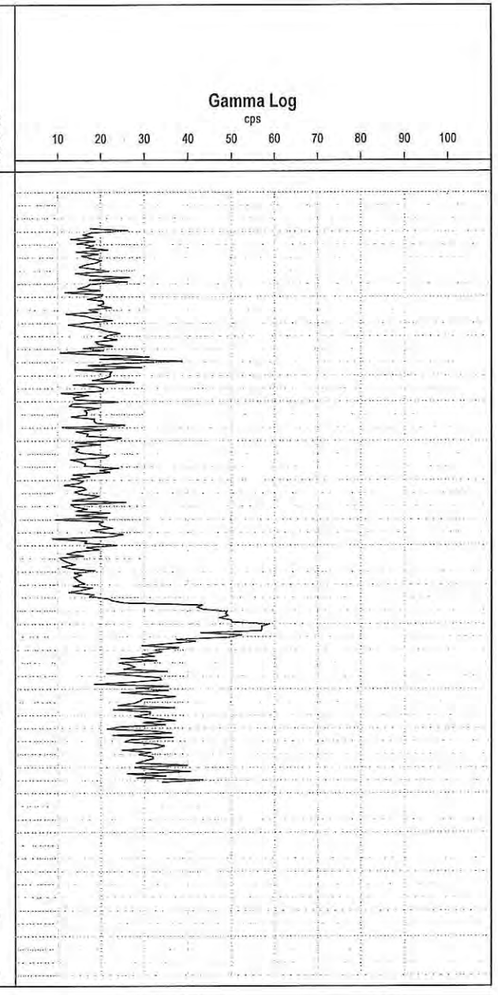
COUNTY: Iosco
TOWNSHIP: Oscoda
TOWN: T24N
RANGE: R9E
SECTION: 27

LOGGING DATE: 3-22-17
DRILLER: Brian Lower
GAMMA LOGGED BY: Jeff Pincumbe
DRILL METHOD: Geoprobe
WELL DEPTH: NA

LOCATION DESCRIPTION: 350 feet south of boat launch at west end of Woodland Drive

ERNIE#: 35000152

WELL CONSTRUCTION	LITHOLOGIC LOG	DESCRIPTION	DEPTH
		Grd.	0
		SAND Fine. light gray	
		SAND Fine, dark gray, saturated	
		Groundwater sample collected from 4-9 feet	5
			10
		Groundwater sample collected from 14-19 feet	15
		NO CUTTINGS Able to drive 3.25 inch rods to 48 feet - refusal.	20
		Groundwater samples collected with 1.25 inch rods.	
		Groundwater sample collected from 24-29 feet	25
			30
		No groundwater sample collected from 34-39 feet. Would not pump.	35
			40
		Log TD	45
			50
			55
			60



VERTICAL DATUM: USGS
GRD. ELEVATION: 586.021
T.O.C.: NA
S.W.L.: 1 foot
CASING: NA
PROBE MODEL: Gamma
SERIAL NUMBER:
COMPLETION NOTES: Backfilled with bentonite

LATITUDE: 44.459718936
LONGITUDE: -83.341832187
DATUM: MichGeoRef
NORTHING: 437677.130
EASTING: 711285.858

Remediation and Redevelopment Division

GEOPHYSICAL LOG

SITE: Wurtsmith - Loud Drive

BORING/WELL: LD-B10

COUNTY: Iosco
TOWNSHIP: Oscoda
TOWN: T24N
RANGE: R9E
SECTION: 27

LOGGING DATE: 3-22-17
DRILLER: Brian Lower
GAMMA LOGGED BY: Jeff Pincumbe
DRILL METHOD: Geoprobe
WELL DEPTH: NA

LOCATION DESCRIPTION: 300 feet SW of boat launch at west end of Woodland Drive

ERNIE#: 35000152

WELL CONSTRUCTION	LITHOLOGIC LOG	DESCRIPTION	DEPTH	Gamma Log (cps)
		Grd.	0	No Gamma Log for this
		NO CUTTING Groundwater samples only		
		Groundwater sample collected from 4-9 feet	5	
			10	
		Groundwater sample collected from 14-19 feet	15	
			20	
		Groundwater sample collected from 24-29 feet	25	
		Log TD	30	
			35	
			40	
			45	
			50	
			55	
			60	

Gamma Log scale: 10 20 30 40 50 60 70 80 90 100

VERTICAL DATUM: USGS
GRD. ELEVATION: 586.021
T.O.C.: NA
S.W.L.: 1 foot
CASING: NA
PROBE MODEL: Gamma
SERIAL NUMBER:
COMPLETION NOTES: Backfilled with bentonite

LATITUDE: 44.459959861
LONGITUDE: -83.342440521
DATUM: MichGeoRef
NORTHING: 437702.317
EASTING: 711236.606

APPENDIX B

Loud Drive PCE, Iosco County
Site ID #35000152

DEQ Laboratory Results

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

03 April 2017

Work Order: 1703145

Price: $690.00

Mike Jury
MDEQ-RRD-SAGINAW BAY
401 Ketchum St., Suite B
Bay City, MI 48708

RE: LOUD DRIVE PCE

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Sincerely,

Kirby Shane
Laboratory Director

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

MDEQ-RRD-SAGINAW BAY	Project: LOUD DRIVE PCE	
401 Ketchum St., Suite B	Site Code: 35000152	**Reported:**
Bay City MI, 48708	Project Manager: Mike Jury	04/03/2017

Analytical Report for Samples

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
LD-B-9 4-9	1703145-01	Water	03/22/2017	03/24/2017	
LD-B-9 14-19	1703145-02	Water	03/22/2017	03/24/2017	
LD-B-9 24-29	1703145-03	Water	03/22/2017	03/24/2017	
LD-B-10 4-9	1703145-04	Water	03/22/2017	03/24/2017	
LD-B-10 14-19	1703145-05	Water	03/22/2017	03/24/2017	
LD-B-10 22-29	1703145-06	Water	03/22/2017	03/24/2017	

Notes and Definitions

X	Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200 ºC. 2-Methylnaphthalene & naphthalene have boiling points above 200 ºC and are better suited to analysis by methods 8270 & 625 as semivolatile organics.
A04	Result is estimated due to high matrix spike recovery.
ND	Indicates compound analyzed for but not detected
RL	Reporting Limit
NA	Not Applicable

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 4-9
Lab ID: 1703145-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 4-9

Lab ID: 1703145-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*101 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*104 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*98.7 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 14-19
Lab ID: 1703145-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 14-19

Lab ID: 1703145-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*97.9 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*105 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*100 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 24-29
Lab ID: 1703145-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-9 24-29

Lab ID: 1703145-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*101 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*105 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*101 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 4-9
Lab ID: 1703145-04

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 4-9

Lab ID: 1703145-04

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*101 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*103 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*99.6 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 14-19
Lab ID: 1703145-05

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 14-19

Lab ID: 1703145-05

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*97.6 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*103 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*98.4 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 22-29
Lab ID: 1703145-06

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	03/28/17	B7C2802	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-B-10 22-29

Lab ID: 1703145-06

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	03/28/17	B7C2802	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	03/28/17	B7C2802	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	03/28/17	B7C2802	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	03/28/17	B7C2802	8260	
Surrogate: Bromofluorobenzene			*99.9 %*	*85-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Dibromofluoromethane			*103 %*	*82.7-115*		*03/28/17*	B7C2802	*8260*	
Surrogate: Toluene-d8			*98.7 %*	*85-115*		*03/28/17*	B7C2802	*8260*	

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Lab Work Order Number	Project Name	Matrix
1703145	Loud Drive PCE	WATER

Site Code/Project Number: 35000152	AY: 17	CC Email 1: pincumbej	Project TAT Days:	Sample Collector: Jeff Pincumbe
Dept-Division-District: DEQ-RRD-Saginaw/Bay	Index: 44031	CC Email 2: shireyb	Project Due Date:	Sample Collector Phone: 517-335-6418
State Project Manager: Mike Jury	PCA: 30740	CC Email 3:		Contract Firm:
State Project Manager Email: jurym1	Project: 457179	Overflow Lab Choice 1:	Accept Analysis hold time codes:	Contract Firm Primary Contact:
State Project Manager Phone: 989-894-6255	Phase: 00	Overflow Lab Choice 2:		Primary Contact Phone:

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	01	LD - B-9 4-9	3-22-17			
2	02	LD - B-9 14-19				
3	03	LD - B-9 24-29				
4	04	LD - B-10 4-9				
5	05	LD - B-10 14-19				
6	06	LD - B-10 22-28				
7						
8						
9						
10						

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic	
Volatiles - Full List	1 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10
METH - Methane, Ethane, Ethene	
Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10
ON - Pesticides, PCBs	
Pesticides & PCBs	1 2 3 4 5 6 7 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10
PCBs only	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10
BNA - Base Neutral Acids	
BNAs	1 2 3 4 5 6 7 8 9 10
Benzidines	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10
Acids only	1 2 3 4 5 6 7 8 9 10
Organic Specialty Requests	
Library search - Volatiles	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10
METALS CHEMISTRY PACKAGES	
OpMemo2 - Total	1 2 3 4 5 6 7 8 9 10
OpMemo2 - Dissolved	1 2 3 4 5 6 7 8 9 10
(Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved	1 2 3 4 5 6 7 8 9 10
(As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	

MAD - DISSOLVED METALS

Diss - Silver - Ag	1 2 3 4 5 6 7 8 9 10
Diss - Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Diss - Arsenic - As	1 2 3 4 5 6 7 8 9 10
Diss - Boron - B	1 2 3 4 5 6 7 8 9 10
Diss - Barium - Ba	1 2 3 4 5 6 7 8 9 10
Diss - Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Diss - Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Diss - Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Diss - Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Diss - Copper - Cu	1 2 3 4 5 6 7 8 9 10
Diss - Iron - Fe	1 2 3 4 5 6 7 8 9 10
Diss - Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Diss - Lithium - Li	1 2 3 4 5 6 7 8 9 10
Diss - Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Diss - Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Diss - Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Diss - Lead - Pb	1 2 3 4 5 6 7 8 9 10
Diss - Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Diss - Selenium - Se	1 2 3 4 5 6 7 8 9 10
Diss - Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Diss - Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Diss - Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Diss - Uranium - U	1 2 3 4 5 6 7 8 9 10
Diss - Vanadium - V	1 2 3 4 5 6 7 8 9 10
Diss - Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Diss - Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Diss - Potassium - K	1 2 3 4 5 6 7 8 9 10
Diss - Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Diss - Sodium - Na	1 2 3 4 5 6 7 8 9 10
Diss - Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
MD - Metals Dissolved	
Lab Filtration	1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS

Silver - Ag	1 2 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Boron - B	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10
Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
LHG - Low Level Mercury	
Mercury Low Level - Hg	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GB Total Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GB Amenable Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GCN Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
CA Chlorophyll	1 2 3 4 5 6 7 8 9 10
GN Ortho Phosphate - OP	1 2 3 4 5 6 7 8 9 10
GN Nitrite - NO_2	1 2 3 4 5 6 7 8 9 10
GN Nitrate - NO_3 (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Suspended Solids - SS	1 2 3 4 5 6 7 8 9 10
GN Dissolved Solids - TDS	1 2 3 4 5 6 7 8 9 10
MN Diss Solids - TDS (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Turbidity	1 2 3 4 5 6 7 8 9 10
MN Total Alkalinity	1 2 3 4 5 6 7 8 9 10
MN Bicarb/Carb Alkalinity (Includes Total Alkalinity)	1 2 3 4 5 6 7 8 9 10
MN Chloride - Cl	1 2 3 4 5 6 7 8 9 10
MN Fluoride - F	1 2 3 4 5 6 7 8 9 10
MN Sulfate - SO4	1 2 3 4 5 6 7 8 9 10
MN Chromium 6 - Cr+6	1 2 3 4 5 6 7 8 9 10
MN Conductivity	1 2 3 4 5 6 7 8 9 10
MN pH	1 2 3 4 5 6 7 8 9 10
GA Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GA Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
GA Ammonia - NH3	1 2 3 4 5 6 7 8 9 10
GA Nitrate+Nitrite - NO3+NO2	1 2 3 4 5 6 7 8 9 10
GA Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
GA Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	Jeff Pincumbe - MDEQ	Melissa Smith	
Signature:	[signature]	[signature]	3/24/17 1425
Print Name & Org.			
Signature:			
Print Name & Org.			
Signature:			

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

31 May 2017

Work Order: 1705098

Price: $115.00

Mike Jury
MDEQ-RRD-SAGINAW BAY
401 Ketchum St., Suite B
Bay City, MI 48708
RE: LOUD DRIVE PCE

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Sincerely,

Kirby Shane
Laboratory Director

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

MDEQ-RRD-SAGINAW BAY	Project: LOUD DRIVE PCE	
401 Ketchum St., Suite B	Site Code: 35000152	**Reported:**
Bay City MI, 48708	Project Manager: Mike Jury	05/31/2017

Analytical Report for Samples

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
LD-MW-3	1705098-01	Water	05/09/2017	05/10/2017	

Notes and Definitions

X	Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200 °C. 2-Methylnaphthalene & naphthalene have boiling points above 200 °C and are better suited to analysis by methods 8270 & 625 as semivolatile organics.
A11	Result is estimated due to high initial verification standard criteria failure.
A06	Result is estimated due to high continuing calibration standard criteria failure.
A03	Result(s) and reporting limit(s) are estimated due to low matrix spike recovery.
ND	Indicates compound analyzed for but not detected
RL	Reporting Limit
NA	Not Applicable

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-MW-3
Lab ID: 1705098-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
540-84-1	2,2,4-Trimethylpentane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	05/12/17	B7E1205	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: LD-MW-3

Lab ID: 1705098-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
110-54-3	Hexane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	05/12/17	B7E1205	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	05/12/17	B7E1205	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	05/12/17	B7E1205	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	05/12/17	B7E1205	8260	
Surrogate: Bromofluorobenzene			*106 %*	*85-115*		*05/12/17*	B7E1205	*8260*	
Surrogate: Dibromofluoromethane			*113 %*	*82.7-115*		*05/12/17*	B7E1205	*8260*	
Surrogate: Toluene-d8			*111 %*	*85-115*		*05/12/17*	B7E1205	*8260*	

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Lab Work Order Number	Project Name	Matrix
1705098	Loud Drive PCE	WATER

Site Code/Project Number: 35000152	AY: 17	CC Email 1: pincumbej	Project TAT Days:	Sample Collector: Jeff Pincumbe
Dept-Division-District: DEQ-RRD-Saginaw bay	Index: 44031	CC Email 2: shireyb	Project Due Date:	Sample Collector Phone: 517-335-6418
State Project Manager: Mike Jury	PCA: 30740	CC Email 3:		Contract Firm:
State Project Manager Email: juerym1	Project: 457179	Overflow Lab Choice 1:	Accept Analysis hold time codes:	Contract Firm Primary Contact:
State Project Manager Phone: 989-894-6255	Phase: 00	Overflow Lab Choice 2:		Primary Contact Phone:

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	01	~~[illegible]~~ 3 JAR LD-MW-7	5-9-17			
2						
3						
4						
5						
6						
7						
8						
9						
10						

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic	
Volatiles - Full List	(1) 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10
METH - Methane, Ethane, Ethene	
Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10
ON - Pesticides, PCBs	
Pesticides & PCBs	1 2 3 4 5 6 7 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10
PCBs only	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10
BNA - Base Neutral Acids	
BNAs	1 2 3 4 5 6 7 8 9 10
Benzidines	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10
Acids only	1 2 3 4 5 6 7 8 9 10
Organic Specialty Requests	
Library search - Volatiles	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

OpMemo2 - Total	1 2 3 4 5 6 7 8 9 10
OpMemo2 - Dissolved	1 2 3 4 5 6 7 8 9 10
(Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved	1 2 3 4 5 6 7 8 9 10
(As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	

MAD - DISSOLVED METALS

Diss - Silver - Ag	1 2 3 4 5 6 7 8 9 10
Diss - Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Diss - Arsenic - As	1 2 3 4 5 6 7 8 9 10
Diss - Boron - B	1 2 3 4 5 6 7 8 9 10
Diss - Barium - Ba	1 2 3 4 5 6 7 8 9 10
Diss - Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Diss - Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Diss - Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Diss - Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Diss - Copper - Cu	1 2 3 4 5 6 7 8 9 10
Diss - Iron - Fe	1 2 3 4 5 6 7 8 9 10
Diss - Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Diss - Lithium - Li	1 2 3 4 5 6 7 8 9 10
Diss - Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Diss - Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Diss - Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Diss - Lead - Pb	1 2 3 4 5 6 7 8 9 10
Diss - Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Diss - Selenium - Se	1 2 3 4 5 6 7 8 9 10
Diss - Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Diss - Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Diss - Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Diss - Uranium - U	1 2 3 4 5 6 7 8 9 10
Diss - Vanadium - V	1 2 3 4 5 6 7 8 9 10
Diss - Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Diss - Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Diss - Potassium - K	1 2 3 4 5 6 7 8 9 10
Diss - Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Diss - Sodium - Na	1 2 3 4 5 6 7 8 9 10
Diss - Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
MD - Metals Dissolved Lab Filtration	1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS

Silver - Ag	1 2 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Boron - B	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10
Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
LHG - Low Level Mercury Mercury Low Level - Hg	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GB Total Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GB Amenable Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GCN Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
CA Chlorophyll	1 2 3 4 5 6 7 8 9 10
GN Ortho Phosphate - OP	1 2 3 4 5 6 7 8 9 10
GN Nitrite - NO_2	1 2 3 4 5 6 7 8 9 10
GN Nitrate - NO_3 (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Suspended Solids - SS	1 2 3 4 5 6 7 8 9 10
GN Dissolved Solids - TDS	1 2 3 4 5 6 7 8 9 10
MN Diss Solids - TDS (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Turbidity	1 2 3 4 5 6 7 8 9 10
MN Total Alkalinity	1 2 3 4 5 6 7 8 9 10
MN Bicarb/Carb Alkalinity (Includes Total Alkalinity)	1 2 3 4 5 6 7 8 9 10
MN Chloride - Cl	1 2 3 4 5 6 7 8 9 10
MN Fluoride - F	1 2 3 4 5 6 7 8 9 10
MN Sulfate - SO4	1 2 3 4 5 6 7 8 9 10
MN Chromium 6 - Cr+6	1 2 3 4 5 6 7 8 9 10
MN Conductivity	1 2 3 4 5 6 7 8 9 10
MN pH	1 2 3 4 5 6 7 8 9 10
GA Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GA Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
GA Ammonia - NH3	1 2 3 4 5 6 7 8 9 10
GA Nitrate+Nitrite - NO3+NO2	1 2 3 4 5 6 7 8 9 10
GA Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
GA Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	Jeff Pincumbe - MDEQ	Jordan Hardley MDEQ	5/10/17 0835
Signature:			
Print Name & Org.			
Signature:			
Print Name & Org.			
Signature:			

APPENDIX C

Loud Drive PCE, Iosco County
Site ID #35000152

Test America Laboratory Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-26905-1
Client Project/Site: Wurtsmith - 3500058

For:
Michigan Dept. of Environmental Quality
Constitution Hall 3rd floor SW
525 W. Allegan Street
Lansing, Michigan 48909

Attn: Bob Delaney

Kris Brooks

Authorized for release by:
4/27/2017 7:07:00 PM

Kris Brooks, Project Manager II
(330)966-9790
kris.brooks@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 6
Method Summary 9
Sample Summary 10
Client Sample Results 11
Isotope Dilution Summary 18
QC Sample Results 19
QC Association Summary 25
Lab Chronicle 26
Certification Summary 28
Chain of Custody 30
Field Data Sheets 32
Receipt Checklists 33

Definitions/Glossary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

Job ID: 320-26905-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: Michigan Dept. of Environmental Quality

Project: Wurtsmith - 3500058

Report Number: 320-26905-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT
The samples were received on 3/25/2017 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3° C.

The following samples were received at the laboratory without a sample collection time documented on the chain of custody: LD-B-9 4-9 (320-26905-1), LD-B-9 14-19 (320-26905-2), LD-B-9 24-29 (320-26905-3), LD-B-10 4-9 (320-26905-4), LD-B-10 14-19 (320-26905-5), LD-B-10 24-29 (320-26905-6) and VAN ETTEN LAKE SW (320-26905-7). The client has not yet been contacted.

PERFLUORINATED HYDROCARBONS
Samples LD-B-9 4-9 (320-26905-1), LD-B-9 14-19 (320-26905-2), LD-B-9 24-29 (320-26905-3), LD-B-10 4-9 (320-26905-4), LD-B-10 14-19 (320-26905-5), LD-B-10 24-29 (320-26905-6) and VAN ETTEN LAKE SW (320-26905-7) were analyzed for Perfluorinated Hydrocarbons in accordance with SOP WS-OC-0025. The samples were prepared on 04/04/2017 and 04/05/2017 and analyzed on 04/17/2017 and 04/18/2017.

Perfluorobutanoic acid (PFBA) and Perfluorotetradecanoic acid (PFTeA) were detected in method blanks MB 320-158030/1-A and MB 320-158232/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Job ID: 320-26905-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

Approximately 250mL of the aqueous portion of the following samples was decanted into new polyethylene bottles prior to extraction, due to the original sample bottles containing a slight excess of sediment which had the potential to clog the solid-phase column: LD-B-9 4-9 (320-26905-1), LD-B-9 14-19 (320-26905-2), LD-B-9 24-29 (320-26905-3), LD-B-10 4-9 (320-26905-4), LD-B-10 14-19 (320-26905-5), LD-B-10 24-29 (320-26905-6) and VAN ETTEN LAKE SW (320-26905-7).

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: LD-B-9 4-9 (320-26905-1), LD-B-9 14-19 (320-26905-2), LD-B-9 24-29 (320-26905-3), LD-B-10 4-9 (320-26905-4), LD-B-10 14-19 (320-26905-5), LD-B-10 24-29 (320-26905-6), 13C8 FOSA: VAN ETTEN LAKE SW (320-26905-7), (LCS 320-158232/2-A), (LCS 320-158030/2-A) and (LCSD 320-158030/3-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. The samples were re-analyzed and the low IDA recoveries for 13C8 FOSA were confirmed. The original results are reported.

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

Detection Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-9 4-9 — Lab Sample ID: 320-26905-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	9.1	B	2.0	0.45	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	17		2.0	0.97	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	15		2.0	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.88	J	2.0	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	7.0		2.0	0.64	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.2	J	2.0	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	3.8		2.0	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorotridecanoic Acid (PFTriA)	0.62	J	2.0	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.32	J B	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.51	J	2.0	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.77	J	2.0	0.63	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LD-B-9 14-19 — Lab Sample ID: 320-26905-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	12		1.9	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	35		1.9	0.96	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	32		1.9	0.76	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.97	J	1.9	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.79	J	1.9	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	3.2		1.9	0.63	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.51	J	1.9	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	2.1		1.9	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorotridecanoic Acid (PFTriA)	0.64	J	1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.44	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.3	J	1.9	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	8.7		1.9	0.89	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.2		1.9	0.84	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LD-B-9 24-29 — Lab Sample ID: 320-26905-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3		1.9	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	4.8		1.9	0.96	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	5.7		1.9	0.76	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.9	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.6	J	1.9	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	12		1.9	0.63	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.5	J	1.9	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	4.6		1.9	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.49	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.30	J	1.9	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.8		1.9	0.89	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.1		1.9	0.84	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LD-B-10 4-9 — Lab Sample ID: 320-26905-4

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-10 4-9 (Continued) — Lab Sample ID: 320-26905-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.0		1.9	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.9		1.9	0.96	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.1		1.9	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.95	J	1.9	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5.7		1.9	0.63	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.85	J	1.9	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	3.0		1.9	0.72	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.9	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.3		1.9	0.89	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.90	J	1.9	0.84	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LD-B-10 14-19 — Lab Sample ID: 320-26905-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.1		1.9	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.3		1.9	0.96	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.0		1.9	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.2	J	1.9	0.63	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.99	J	1.9	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.23	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.56	J	1.9	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.7		1.9	0.89	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.8	J	1.9	0.84	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LD-B-10 24-29 — Lab Sample ID: 320-26905-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.0		2.0	0.45	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	4.5		2.0	0.97	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.2		2.0	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.94	J	2.0	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	6.0		2.0	0.64	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.86	J	2.0	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	2.8		2.0	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.41	J	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.85	J	2.0	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.5		2.0	0.90	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.2	J	2.0	0.86	ng/L	1		537 (modified)	Total/NA

Client Sample ID: VAN ETTEN LAKE SW — Lab Sample ID: 320-26905-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.2	B	2.0	0.45	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.2		2.0	0.97	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.6	J	2.0	0.77	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.0	J	2.0	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.7	J	2.0	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	2.0	0.20	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: VAN ETTEN LAKE SW (Continued) — Lab Sample ID: 320-26905-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	5.7		2.0	0.86	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.6		2.0	1.3	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-26905-1	LD-B-9 4-9	Water	03/22/17 00:00	03/25/17 09:40
320-26905-2	LD-B-9 14-19	Water	03/22/17 00:00	03/25/17 09:40
320-26905-3	LD-B-9 24-29	Water	03/22/17 00:00	03/25/17 09:40
320-26905-4	LD-B-10 4-9	Water	03/22/17 00:00	03/25/17 09:40
320-26905-5	LD-B-10 14-19	Water	03/22/17 00:00	03/25/17 09:40
320-26905-6	LD-B-10 24-29	Water	03/22/17 00:00	03/25/17 09:40
320-26905-7	VAN ETTEN LAKE SW	Water	03/23/17 00:00	03/25/17 09:40

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-9 4-9
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-1
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	9.1	B	2.0	0.45	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoropentanoic acid (PFPeA)	17		2.0	0.97	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorohexanoic acid (PFHxA)	15		2.0	0.77	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.79	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorooctanoic acid (PFOA)	0.88	J	2.0	0.73	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorononanoic acid (PFNA)	7.0		2.0	0.64	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorodecanoic acid (PFDA)	1.2	J	2.0	0.43	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoroundecanoic acid (PFUnA)	3.8		2.0	0.73	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.57	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorotridecanoic Acid (PFTriA)	0.62	J	2.0	0.54	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorotetradecanoic acid (PFTeA)	0.32	J B	2.0	0.20	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.51	J	2.0	0.12	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.66	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.90	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.85	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.70	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorooctane Sulfonate (PFOS)	ND		2.0	1.3	ng/L		04/04/17 14:05	04/17/17 00:56	1
Perfluorooctane Sulfonamide (FOSA)	0.77	J	2.0	0.63	ng/L		04/04/17 14:05	04/17/17 00:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*9*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C4 PFBA	*26*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C2 PFHxA	*54*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C4 PFOA	*73*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C5 PFNA	*70*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C2 PFDA	*69*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C2 PFUnA	*65*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C2 PFDoA	*71*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
18O2 PFHxS	*79*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C4 PFOS	*80*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C4-PFHpA	*73*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*
13C5-PFPeA	*44*		*25 - 150*	*04/04/17 14:05*	*04/17/17 00:56*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-9 14-19
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-2
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	12		1.9	0.44	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoropentanoic acid (PFPeA)	35		1.9	0.96	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorohexanoic acid (PFHxA)	32		1.9	0.76	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoroheptanoic acid (PFHpA)	0.97	J	1.9	0.78	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorooctanoic acid (PFOA)	0.79	J	1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorononanoic acid (PFNA)	3.2		1.9	0.63	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorodecanoic acid (PFDA)	0.51	J	1.9	0.43	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoroundecanoic acid (PFUnA)	2.1		1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.57	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorotridecanoic Acid (PFTriA)	0.64	J	1.9	0.53	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorotetradecanoic acid (PFTeA)	0.44	J	1.9	0.19	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.3	J	1.9	0.12	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		1.9	0.65	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorobutanesulfonic acid (PFBS)	8.7		1.9	0.89	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorohexanesulfonic acid (PFHxS)	2.2		1.9	0.84	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.69	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorooctane Sulfonate (PFOS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:03	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.62	ng/L		04/04/17 14:05	04/17/17 01:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*1*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C4 PFBA	*21*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C2 PFHxA	*54*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C4 PFOA	*70*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C5 PFNA	*63*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C2 PFDA	*57*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C2 PFUnA	*51*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C2 PFDoA	*53*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
18O2 PFHxS	*75*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C4 PFOS	*78*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C4-PFHpA	*70*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*
13C5-PFPeA	*41*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:03*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-9 24-29
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-3
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.3		1.9	0.44	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoropentanoic acid (PFPeA)	4.8		1.9	0.96	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorohexanoic acid (PFHxA)	5.7		1.9	0.76	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.9	0.78	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorooctanoic acid (PFOA)	1.6	J	1.9	0.73	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorononanoic acid (PFNA)	12		1.9	0.63	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorodecanoic acid (PFDA)	1.5	J	1.9	0.43	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoroundecanoic acid (PFUnA)	4.6		1.9	0.73	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.57	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.53	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorotetradecanoic acid (PFTeA)	0.49	J	1.9	0.19	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.30	J	1.9	0.12	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		1.9	0.65	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorobutanesulfonic acid (PFBS)	2.8		1.9	0.89	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorohexanesulfonic acid (PFHxS)	4.1		1.9	0.84	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.69	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorooctane Sulfonate (PFOS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:11	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.62	ng/L		04/04/17 14:05	04/17/17 01:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C4 PFBA	*29*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C2 PFHxA	*52*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C4 PFOA	*58*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C5 PFNA	*51*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C2 PFDA	*47*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C2 PFUnA	*49*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C2 PFDoA	*58*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
18O2 PFHxS	*78*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C4 PFOS	*79*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C4-PFHpA	*62*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*
13C5-PFPeA	*44*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:11*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-10 4-9
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-4
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.0		1.9	0.44	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoropentanoic acid (PFPeA)	2.9		1.9	0.96	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorohexanoic acid (PFHxA)	3.1		1.9	0.76	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.78	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorooctanoic acid (PFOA)	0.95	J	1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorononanoic acid (PFNA)	5.7		1.9	0.63	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorodecanoic acid (PFDA)	0.85	J	1.9	0.43	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoroundecanoic acid (PFUnA)	3.0		1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.57	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.53	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.19	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.9	0.12	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		1.9	0.65	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorobutanesulfonic acid (PFBS)	2.3		1.9	0.89	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorohexanesulfonic acid (PFHxS)	0.90	J	1.9	0.84	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.69	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorooctane Sulfonate (PFOS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:18	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.62	ng/L		04/04/17 14:05	04/17/17 01:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*0.5*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C4 PFBA	*32*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C2 PFHxA	*60*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C4 PFOA	*77*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C5 PFNA	*69*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C2 PFDA	*70*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C2 PFUnA	*57*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C2 PFDoA	*60*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
18O2 PFHxS	*85*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C4 PFOS	*93*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C4-PFHpA	*76*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*
13C5-PFPeA	*52*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:18*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-10 14-19
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-5
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.1		1.9	0.44	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoropentanoic acid (PFPeA)	2.3		1.9	0.96	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorohexanoic acid (PFHxA)	3.0		1.9	0.76	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.78	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorononanoic acid (PFNA)	1.2	J	1.9	0.63	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.43	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoroundecanoic acid (PFUnA)	0.99	J	1.9	0.72	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.56	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.53	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorotetradecanoic acid (PFTeA)	0.23	J	1.9	0.19	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.56	J	1.9	0.12	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		1.9	0.65	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorobutanesulfonic acid (PFBS)	2.7		1.9	0.89	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	J	1.9	0.84	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.69	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorooctane Sulfonate (PFOS)	ND		1.9	1.2	ng/L		04/04/17 14:05	04/17/17 01:26	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.62	ng/L		04/04/17 14:05	04/17/17 01:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*3*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C4 PFBA	*33*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C2 PFHxA	*57*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C4 PFOA	*71*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C5 PFNA	*69*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C2 PFDA	*66*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C2 PFUnA	*61*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C2 PFDoA	*69*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
18O2 PFHxS	*79*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C4 PFOS	*83*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C4-PFHpA	*69*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*
13C5-PFPeA	*48*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:26*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-10 24-29
Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-6
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.0		2.0	0.45	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoropentanoic acid (PFPeA)	4.5		2.0	0.97	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorohexanoic acid (PFHxA)	3.2		2.0	0.77	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.79	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorooctanoic acid (PFOA)	0.94	J	2.0	0.74	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorononanoic acid (PFNA)	6.0		2.0	0.64	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorodecanoic acid (PFDA)	0.86	J	2.0	0.43	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoroundecanoic acid (PFUnA)	2.8		2.0	0.74	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.57	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	0.54	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorotetradecanoic acid (PFTeA)	0.41	J	2.0	0.20	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.85	J	2.0	0.12	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.66	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorobutanesulfonic acid (PFBS)	2.5		2.0	0.90	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorohexanesulfonic acid (PFHxS)	1.2	J	2.0	0.86	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.70	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorooctane Sulfonate (PFOS)	ND		2.0	1.3	ng/L		04/04/17 14:05	04/17/17 01:33	1
Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.63	ng/L		04/04/17 14:05	04/17/17 01:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C4 PFBA	*24*	*	*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C2 PFHxA	*57*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C4 PFOA	*75*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C5 PFNA	*71*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C2 PFDA	*71*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C2 PFUnA	*67*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C2 PFDoA	*66*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
18O2 PFHxS	*86*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C4 PFOS	*88*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C4-PFHpA	*71*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*
13C5-PFPeA	*44*		*25 - 150*	*04/04/17 14:05*	*04/17/17 01:33*	*1*

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: VAN ETTEN LAKE SW

Lab Sample ID: 320-26905-7
Matrix: Water

Date Collected: 03/23/17 00:00
Date Received: 03/25/17 09:40

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.2	B	2.0	0.45	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoropentanoic acid (PFPeA)	2.2		2.0	0.97	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorohexanoic acid (PFHxA)	1.6	J	2.0	0.77	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoroheptanoic acid (PFHpA)	1.0	J	2.0	0.79	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorooctanoic acid (PFOA)	1.7	J	2.0	0.74	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.64	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.43	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.74	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.57	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	0.54	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorotetradecanoic acid (PFTeA)	1.2	J B	2.0	0.20	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		2.0	0.12	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.66	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.90	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorohexanesulfonic acid (PFHxS)	5.7		2.0	0.86	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.70	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorooctane Sulfonate (PFOS)	2.6		2.0	1.3	ng/L		04/05/17 15:36	04/18/17 02:41	1
Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.63	ng/L		04/05/17 15:36	04/18/17 02:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*4*	*	*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C4 PFBA	*23*	*	*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C2 PFHxA	*74*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C4 PFOA	*91*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C5 PFNA	*71*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C2 PFDA	*64*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C2 PFUnA	*61*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C2 PFDoA	*59*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
18O2 PFHxS	*89*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C4 PFOS	*90*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C4-PFHpA	*89*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*
13C5-PFPeA	*55*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:41*	*1*

Isotope Dilution Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOS/ (25-150)	3C4 PFB/ (25-150)	3C2 PFHx (25-150)	3C4 PFO/ (25-150)	3C5 PFN/ (25-150)	3C2 PFD/ (25-150)	3C2 PFUn (25-150)	3C2 PFDo (25-150)
320-26905-1	LD-B-9 4-9	9 *	26	54	73	70	69	65	71
320-26905-2	LD-B-9 14-19	1 *	21 *	54	70	63	57	51	53
320-26905-3	LD-B-9 24-29	2 *	29	52	58	51	47	49	58
320-26905-4	LD-B-10 4-9	0.5 *	32	60	77	69	70	57	60
320-26905-5	LD-B-10 14-19	3 *	33	57	71	69	66	61	69
320-26905-6	LD-B-10 24-29	2 *	24 *	57	75	71	71	67	66
320-26905-7	VAN ETTEN LAKE SW	4 *	23 *	74	91	71	64	61	59
LCS 320-158030/2-A	Lab Control Sample	24 *	71	79	94	95	114	108	104
LCS 320-158232/2-A	Lab Control Sample	10 *	109	107	113	107	110	110	102
LCSD 320-158030/3-A	Lab Control Sample Dup	21 *	80	87	109	112	126	118	123
LCSD 320-158232/3-A	Lab Control Sample Dup	39	111	111	116	106	115	111	102
MB 320-158030/1-A	Method Blank	16 *	85	81	84	81	79	82	74
MB 320-158232/1-A	Method Blank	45	102	102	116	98	103	108	99

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	8O2 PFHx (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5-PFPe (25-150)
320-26905-1	LD-B-9 4-9	79	80	73	44
320-26905-2	LD-B-9 14-19	75	78	70	41
320-26905-3	LD-B-9 24-29	78	79	62	44
320-26905-4	LD-B-10 4-9	85	93	76	52
320-26905-5	LD-B-10 14-19	79	83	69	48
320-26905-6	LD-B-10 24-29	86	88	71	44
320-26905-7	VAN ETTEN LAKE SW	89	90	89	55
LCS 320-158030/2-A	Lab Control Sample	80	85	99	71
LCS 320-158232/2-A	Lab Control Sample	104	97	120	102
LCSD 320-158030/3-A	Lab Control Sample Dup	91	94	112	79
LCSD 320-158232/3-A	Lab Control Sample Dup	103	101	123	106
MB 320-158030/1-A	Method Blank	78	74	92	80
MB 320-158232/1-A	Method Blank	99	92	118	99

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5-PFPeA = 13C5-PFPeA

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-158030/1-A
Matrix: Water
Analysis Batch: 160292

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 158030

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.967	J	2.0	0.46	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.99	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.79	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.44	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.75	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.58	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	0.55	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorotetradecanoic acid (PFTeA)	0.714	J	2.0	0.20	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		2.0	0.12	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.67	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.71	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorooctane Sulfonate (PFOS)	ND		2.0	1.3	ng/L		04/04/17 14:05	04/18/17 18:37	1
Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.64	ng/L		04/04/17 14:05	04/18/17 18:37	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*16*	*	*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C4 PFBA	*85*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C2 PFHxA	*81*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C4 PFOA	*84*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C5 PFNA	*81*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C2 PFDA	*79*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C2 PFUnA	*82*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C2 PFDoA	*74*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
18O2 PFHxS	*78*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C4 PFOS	*74*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C4-PFHpA	*92*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*
13C5-PFPeA	*80*		*25 - 150*	*04/04/17 14:05*	*04/18/17 18:37*	*1*

Lab Sample ID: LCS 320-158030/2-A
Matrix: Water
Analysis Batch: 159837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 158030

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	42.9		ng/L		107	74 - 138
Perfluoropentanoic acid (PFPeA)	40.0	37.1		ng/L		93	69 - 134
Perfluorohexanoic acid (PFHxA)	40.0	40.5		ng/L		101	70 - 136
Perfluoroheptanoic acid (PFHpA)	40.0	39.3		ng/L		98	63 - 135
Perfluorooctanoic acid (PFOA)	40.0	39.2		ng/L		98	63 - 141
Perfluorononanoic acid (PFNA)	40.0	43.4		ng/L		108	71 - 140
Perfluorodecanoic acid (PFDA)	40.0	33.9		ng/L		85	66 - 141

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-158030/2-A
Matrix: Water
Analysis Batch: 159837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 158030

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroundecanoic acid (PFUnA)	40.0	37.1		ng/L		93	68 - 139
Perfluorododecanoic acid (PFDoA)	40.0	36.6		ng/L		91	71 - 139
Perfluorotridecanoic Acid (PFTriA)	40.0	36.6		ng/L		91	51 - 139
Perfluorotetradecanoic acid (PFTeA)	40.0	39.9		ng/L		100	47 - 130
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	33.9		ng/L		85	50 - 150
Perfluoro-n-octadecanoic acid (PFODA)	40.0	31.2		ng/L		78	50 - 150
Perfluorobutanesulfonic acid (PFBS)	35.4	30.2		ng/L		85	55 - 147
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.5		ng/L		92	58 - 138
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.8		ng/L		102	32 - 170
Perfluorodecanesulfonic acid (PFDS)	38.6	38.7		ng/L		100	35 - 157
Perfluorooctane Sulfonate (PFOS)	37.1	34.6		ng/L		93	47 - 162
Perfluorooctane Sulfonamide (FOSA)	40.0	40.7		ng/L		102	59 - 163

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*24*	*	*25 - 150*
13C4 PFBA	*71*		*25 - 150*
13C2 PFHxA	*79*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C5 PFNA	*95*		*25 - 150*
13C2 PFDA	*114*		*25 - 150*
13C2 PFUnA	*108*		*25 - 150*
13C2 PFDoA	*104*		*25 - 150*
18O2 PFHxS	*80*		*25 - 150*
13C4 PFOS	*85*		*25 - 150*
13C4-PFHpA	*99*		*25 - 150*
13C5-PFPeA	*71*		*25 - 150*

Lab Sample ID: LCSD 320-158030/3-A
Matrix: Water
Analysis Batch: 159837

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 158030

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	43.5		ng/L		109	74 - 138	1	30
Perfluoropentanoic acid (PFPeA)	40.0	37.7		ng/L		94	69 - 134	2	30
Perfluorohexanoic acid (PFHxA)	40.0	42.0		ng/L		105	70 - 136	4	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.5		ng/L		99	63 - 135	1	30
Perfluorooctanoic acid (PFOA)	40.0	38.0		ng/L		95	63 - 141	3	30
Perfluorononanoic acid (PFNA)	40.0	42.2		ng/L		106	71 - 140	3	30
Perfluorodecanoic acid (PFDA)	40.0	37.0		ng/L		93	66 - 141	9	30

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-158030/3-A
Matrix: Water
Analysis Batch: 159837

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 158030

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroundecanoic acid (PFUnA)	40.0	37.3		ng/L		93	68 - 139	1	30
Perfluorododecanoic acid (PFDoA)	40.0	37.0		ng/L		92	71 - 139	1	30
Perfluorotridecanoic Acid (PFTriA)	40.0	35.8		ng/L		89	51 - 139	2	30
Perfluorotetradecanoic acid (PFTeA)	40.0	40.5		ng/L		101	47 - 130	1	30
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	33.0		ng/L		83	50 - 150	3	30
Perfluoro-n-octadecanoic acid (PFODA)	40.0	32.8		ng/L		82	50 - 150	5	30
Perfluorobutanesulfonic acid (PFBS)	35.4	30.3		ng/L		86	55 - 147	0	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.2		ng/L		94	58 - 138	2	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	41.0		ng/L		108	32 - 170	5	30
Perfluorodecanesulfonic acid (PFDS)	38.6	39.3		ng/L		102	35 - 157	1	30
Perfluorooctane Sulfonate (PFOS)	37.1	36.3		ng/L		98	47 - 162	5	30
Perfluorooctane Sulfonamide (FOSA)	40.0	39.7		ng/L		99	59 - 163	2	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*21*	*	*25 - 150*
13C4 PFBA	*80*		*25 - 150*
13C2 PFHxA	*87*		*25 - 150*
13C4 PFOA	*109*		*25 - 150*
13C5 PFNA	*112*		*25 - 150*
13C2 PFDA	*126*		*25 - 150*
13C2 PFUnA	*118*		*25 - 150*
13C2 PFDoA	*123*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*94*		*25 - 150*
13C4-PFHpA	*112*		*25 - 150*
13C5-PFPeA	*79*		*25 - 150*

Lab Sample ID: MB 320-158232/1-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 158232

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.24	J	2.0	0.46	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.99	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.79	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.44	ng/L		04/05/17 15:36	04/18/17 02:19	1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: MB 320-158232/1-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 158232

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.75	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.58	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	0.55	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorotetradecanoic acid (PFTeA)	1.50	J	2.0	0.20	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		2.0	0.12	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.67	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.71	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorooctane Sulfonate (PFOS)	ND		2.0	1.3	ng/L		04/05/17 15:36	04/18/17 02:19	1
Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.64	ng/L		04/05/17 15:36	04/18/17 02:19	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*45*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C4 PFBA	*102*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C2 PFHxA	*102*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C4 PFOA	*116*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C5 PFNA	*98*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C2 PFDA	*103*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C2 PFUnA	*108*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C2 PFDoA	*99*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
18O2 PFHxS	*99*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C4 PFOS	*92*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C4-PFHpA	*118*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*
13C5-PFPeA	*99*		*25 - 150*	*04/05/17 15:36*	*04/18/17 02:19*	*1*

Lab Sample ID: LCS 320-158232/2-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 158232

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	40.1		ng/L		100	74 - 138
Perfluoropentanoic acid (PFPeA)	40.0	38.6		ng/L		96	69 - 134
Perfluorohexanoic acid (PFHxA)	40.0	37.7		ng/L		94	70 - 136
Perfluoroheptanoic acid (PFHpA)	40.0	36.1		ng/L		90	63 - 135
Perfluorooctanoic acid (PFOA)	40.0	34.8		ng/L		87	63 - 141
Perfluorononanoic acid (PFNA)	40.0	32.9		ng/L		82	71 - 140
Perfluorodecanoic acid (PFDA)	40.0	36.6		ng/L		92	66 - 141
Perfluoroundecanoic acid (PFUnA)	40.0	36.4		ng/L		91	68 - 139
Perfluorododecanoic acid (PFDoA)	40.0	35.7		ng/L		89	71 - 139
Perfluorotridecanoic Acid (PFTriA)	40.0	38.1		ng/L		95	51 - 139
Perfluorotetradecanoic acid (PFTeA)	40.0	39.9		ng/L		100	47 - 130

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-158232/2-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 158232

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	36.8		ng/L		92	50 - 150
Perfluoro-n-octadecanoic acid (PFODA)	40.0	30.9		ng/L		77	50 - 150
Perfluorobutanesulfonic acid (PFBS)	35.4	34.7		ng/L		98	55 - 147
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.6		ng/L		87	58 - 138
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.2		ng/L		103	32 - 170
Perfluorodecanesulfonic acid (PFDS)	38.6	34.7		ng/L		90	35 - 157
Perfluorooctane Sulfonate (PFOS)	37.1	34.7		ng/L		93	47 - 162
Perfluorooctane Sulfonamide (FOSA)	40.0	35.9		ng/L		90	59 - 163

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*10*	*	*25 - 150*
13C4 PFBA	*109*		*25 - 150*
13C2 PFHxA	*107*		*25 - 150*
13C4 PFOA	*113*		*25 - 150*
13C5 PFNA	*107*		*25 - 150*
13C2 PFDA	*110*		*25 - 150*
13C2 PFUnA	*110*		*25 - 150*
13C2 PFDoA	*102*		*25 - 150*
18O2 PFHxS	*104*		*25 - 150*
13C4 PFOS	*97*		*25 - 150*
13C4-PFHpA	*120*		*25 - 150*
13C5-PFPeA	*102*		*25 - 150*

Lab Sample ID: LCSD 320-158232/3-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 158232

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	40.0		ng/L		100	74 - 138	0	30
Perfluoropentanoic acid (PFPeA)	40.0	39.2		ng/L		98	69 - 134	2	30
Perfluorohexanoic acid (PFHxA)	40.0	39.0		ng/L		98	70 - 136	4	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.6		ng/L		99	63 - 135	9	30
Perfluorooctanoic acid (PFOA)	40.0	35.6		ng/L		89	63 - 141	2	30
Perfluorononanoic acid (PFNA)	40.0	33.2		ng/L		83	71 - 140	1	30
Perfluorodecanoic acid (PFDA)	40.0	36.3		ng/L		91	66 - 141	1	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.3		ng/L		93	68 - 139	2	30
Perfluorododecanoic acid (PFDoA)	40.0	38.9		ng/L		97	71 - 139	9	30
Perfluorotridecanoic Acid (PFTriA)	40.0	41.7		ng/L		104	51 - 139	9	30
Perfluorotetradecanoic acid (PFTeA)	40.0	41.4		ng/L		104	47 - 130	4	30

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-158232/3-A
Matrix: Water
Analysis Batch: 160101

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 158232

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoro-n-hexadecanoic acid (PFHxDA)			40.0	32.2		ng/L		81	50 - 150	13	30
Perfluoro-n-octadecanoic acid (PFODA)			40.0	29.9		ng/L		75	50 - 150	3	30
Perfluorobutanesulfonic acid (PFBS)			35.4	37.4		ng/L		106	55 - 147	8	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	33.2		ng/L		91	58 - 138	5	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	39.1		ng/L		103	32 - 170	0	30
Perfluorodecanesulfonic acid (PFDS)			38.6	36.0		ng/L		93	35 - 157	4	30
Perfluorooctane Sulfonate (PFOS)			37.1	35.4		ng/L		95	47 - 162	2	30
Perfluorooctane Sulfonamide (FOSA)			40.0	37.5		ng/L		94	59 - 163	4	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*39*		*25 - 150*
13C4 PFBA	*111*		*25 - 150*
13C2 PFHxA	*111*		*25 - 150*
13C4 PFOA	*116*		*25 - 150*
13C5 PFNA	*106*		*25 - 150*
13C2 PFDA	*115*		*25 - 150*
13C2 PFUnA	*111*		*25 - 150*
13C2 PFDoA	*102*		*25 - 150*
18O2 PFHxS	*103*		*25 - 150*
13C4 PFOS	*101*		*25 - 150*
13C4-PFHpA	*123*		*25 - 150*
13C5-PFPeA	*106*		*25 - 150*

QC Association Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

LCMS

Prep Batch: 158030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-26905-1	LD-B-9 4-9	Total/NA	Water	3535	
320-26905-2	LD-B-9 14-19	Total/NA	Water	3535	
320-26905-3	LD-B-9 24-29	Total/NA	Water	3535	
320-26905-4	LD-B-10 4-9	Total/NA	Water	3535	
320-26905-5	LD-B-10 14-19	Total/NA	Water	3535	
320-26905-6	LD-B-10 24-29	Total/NA	Water	3535	
MB 320-158030/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-158030/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-158030/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Prep Batch: 158232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-26905-7	VAN ETTEN LAKE SW	Total/NA	Water	3535	
MB 320-158232/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-158232/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-158232/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 159837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-26905-1	LD-B-9 4-9	Total/NA	Water	537 (modified)	158030
320-26905-2	LD-B-9 14-19	Total/NA	Water	537 (modified)	158030
320-26905-3	LD-B-9 24-29	Total/NA	Water	537 (modified)	158030
320-26905-4	LD-B-10 4-9	Total/NA	Water	537 (modified)	158030
320-26905-5	LD-B-10 14-19	Total/NA	Water	537 (modified)	158030
320-26905-6	LD-B-10 24-29	Total/NA	Water	537 (modified)	158030
LCS 320-158030/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	158030
LCSD 320-158030/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	158030

Analysis Batch: 160101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-26905-7	VAN ETTEN LAKE SW	Total/NA	Water	537 (modified)	158232
MB 320-158232/1-A	Method Blank	Total/NA	Water	537 (modified)	158232
LCS 320-158232/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	158232
LCSD 320-158232/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	158232

Analysis Batch: 160292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-158030/1-A	Method Blank	Total/NA	Water	537 (modified)	158030

Lab Chronicle

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: LD-B-9 4-9 — Lab Sample ID: 320-26905-1

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.7 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 00:56	JRB	TAL SAC

Client Sample ID: LD-B-9 14-19 — Lab Sample ID: 320-26905-2

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			258.1 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 01:03	JRB	TAL SAC

Client Sample ID: LD-B-9 24-29 — Lab Sample ID: 320-26905-3

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			257.8 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 01:11	JRB	TAL SAC

Client Sample ID: LD-B-10 4-9 — Lab Sample ID: 320-26905-4

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			258.1 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 01:18	JRB	TAL SAC

Client Sample ID: LD-B-10 14-19 — Lab Sample ID: 320-26905-5

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			258.5 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 01:26	JRB	TAL SAC

Client Sample ID: LD-B-10 24-29 — Lab Sample ID: 320-26905-6

Date Collected: 03/22/17 00:00
Date Received: 03/25/17 09:40
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.3 mL	0.5 mL	158030	04/04/17 14:05	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			159837	04/17/17 01:33	JRB	TAL SAC

Lab Chronicle

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Client Sample ID: VAN ETTEN LAKE SW
Date Collected: 03/23/17 00:00
Date Received: 03/25/17 09:40

Lab Sample ID: 320-26905-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.2 mL	0.5 mL	158232	04/05/17 15:36	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			160101	04/18/17 02:41	CBW	TAL SAC

Laboratory References:
TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Laboratory: TestAmerica Sacramento

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
Alaska (UST)	State Program	10	UST-055	12-18-17
Arizona	State Program	9	AZ0708	08-11-17
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-17
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-17
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-17
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	07-31-17
US Fish & Wildlife	Federal		LE148388-0	10-31-17
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-29-17 *

Laboratory: TestAmerica Canton

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
California	State Program	9	2927	04-30-17 *
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17 *
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-17 *
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Wurtsmith - 3500058

TestAmerica Job ID: 320-26905-1

Laboratory: TestAmerica Canton (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
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

MICHIGAN
190

Lab Work Order Number	Project Name	Matrix
	Loud Drive PCE	WATER

Site Code/Project Number	AY	CC Email 1	Project TAT Days	Sample Collector
35000152	17	pincumbej		Jeff Pincumbe
Dept-Division-District	**Index**	**CC Email 2**	**Project Due Date**	**Sample Collector Phone**
DEQ-RRD-Saginwa-bay	44031	shireyb		517-335-6418
State Project Manager	**PCA**	**CC Email 3**		**Contract Firm**
Mike Jury	30740			
State Project Manager Email	**Project**	**Overflow Lab Choice 1**	**Accept Analysis hold time codes**	**Contract Firm Primary Contact**
jurym1	457179			
State Project Manager Phone	**Phase**	**Overflow Lab Choice 2**		**Primary Contact Phone**
989-894-6255	00			

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1		LD - B-9 4-9	3-22-17		2	
2		LD - B-9 14-19				
3		LD - B-9 24-26				
4		LD - B-11 4-9				pH
5		LD - B-10 14-19				
6		LD - B-10 24-26				
7		VAN ETTEN LAKE SW	3-23-17		2	
8						
9						
10						

320-26905 Chain of Custody

ORGANIC CHEMISTRY		MAD - DISSOLVED METALS		MA - TOTAL METALS		GENERAL CHEMISTRY	
VOA - Volatile Organic Acidic		Diss - Silver - Ag	1 2 3 4 5 6 7 8 9 10	Silver - Ag	1 2 3 4 5 6 7 8 9 10	GB Total Cyanide - CN	1 2 3 4 5 6 7 8 9 10
Volatiles - Full List	1 2 3 4 5 6 7 8 9 10	Diss - Aluminum - Al	1 2 3 4 5 6 7 8 9 10	Aluminum - Al	1 2 3 4 5 6 7 8 9 10	GB Amenable Cyanide - CN	1 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10	Diss - Arsenic - As	1 2 3 4 5 6 7 8 9 10	Arsenic - As	1 2 3 4 5 6 7 8 9 10	GCN Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10	Diss - Boron - B	1 2 3 4 5 6 7 8 9 10	Boron - B	1 2 3 4 5 6 7 8 9 10	CA Chlorophyll	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10	Diss - Barium - Ba	1 2 3 4 5 6 7 8 9 10	Barium - Ba	1 2 3 4 5 6 7 8 9 10	GN Ortho Phosphate - OP	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10	Diss - Beryllium - Be	1 2 3 4 5 6 7 8 9 10	Beryllium - Be	1 2 3 4 5 6 7 8 9 10	GN Nitrite - NO_2	1 2 3 4 5 6 7 8 9 10
METH - Methane, Ethane, Ethene		Diss - Cadmium - Cd	1 2 3 4 5 6 7 8 9 10	Cadmium - Cd	1 2 3 4 5 6 7 8 9 10	GN Nitrate - NO_3 (Calc.)	1 2 3 4 5 6 7 8 9 10
Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10	Diss - Cobalt - Co	1 2 3 4 5 6 7 8 9 10	Cobalt - Co	1 2 3 4 5 6 7 8 9 10	GN Suspended Solids - SS	1 2 3 4 5 6 7 8 9 10
ON - Pesticides, PCBs		Diss - Chromium - Cr	1 2 3 4 5 6 7 8 9 10	Chromium - Cr	1 2 3 4 5 6 7 8 9 10	GN Dissolved Solids - TDS	1 2 3 4 5 6 7 8 9 10
Pesticides & PCBs	1 2 3 4 5 6 7 8 9 10	Diss - Copper - Cu	1 2 3 4 5 6 7 8 9 10	Copper - Cu	1 2 3 4 5 6 7 8 9 10	MN Diss Solids - TDS (Calc.)	1 2 3 4 5 6 7 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10	Diss - Iron - Fe	1 2 3 4 5 6 7 8 9 10	Iron - Fe	1 2 3 4 5 6 7 8 9 10	GN Turbidity	1 2 3 4 5 6 7 8 9 10
PCBs only	1 2 3 4 5 6 7 8 9 10	Diss - Mercury - Hg	1 2 3 4 5 6 7 8 9 10	Mercury - Hg	1 2 3 4 5 6 7 8 9 10	MN Total Alkalinity	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10	Diss - Lithium - Li	1 2 3 4 5 6 7 8 9 10	Lithium - Li	1 2 3 4 5 6 7 8 9 10	MN Bicarb/Carb Alkalinity (includes Total Alkalinity)	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10	Diss - Manganese - Mn	1 2 3 4 5 6 7 8 9 10	Manganese - Mn	1 2 3 4 5 6 7 8 9 10		
BNA - Base Neutral Acids		Diss - Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10	Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10	MN Chloride - Cl	1 2 3 4 5 6 7 8 9 10
BNAs	1 2 3 4 5 6 7 8 9 10	Diss - Nickel - Ni	1 2 3 4 5 6 7 8 9 10	Nickel - Ni	1 2 3 4 5 6 7 8 9 10	MN Fluoride - F	1 2 3 4 5 6 7 8 9 10
Benzidines	1 2 3 4 5 6 7 8 9 10	Diss - Lead - Pb	1 2 3 4 5 6 7 8 9 10	Lead - Pb	1 2 3 4 5 6 7 8 9 10	MN Sulfate - SO4	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10	Diss - Antimony - Sb	1 2 3 4 5 6 7 8 9 10	Antimony - Sb	1 2 3 4 5 6 7 8 9 10	MN Chromium 6 - Cr+6	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10	Diss - Selenium - Se	1 2 3 4 5 6 7 8 9 10	Selenium - Se	1 2 3 4 5 6 7 8 9 10	MN Conductivity	1 2 3 4 5 6 7 8 9 10
Acids only	1 2 3 4 5 6 7 8 9 10	Diss - Strontium - Sr	1 2 3 4 5 6 7 8 9 10	Strontium - Sr	1 2 3 4 5 6 7 8 9 10	MN pH	1 2 3 4 5 6 7 8 9 10
Organic Specialty Requests		Diss - Titanium - Ti	1 2 3 4 5 6 7 8 9 10	Titanium - Ti	1 2 3 4 5 6 7 8 9 10	GA Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
Library search - Volatiles	1 2 3 4 5 6 7 8 9 10	Diss - Thallium - Tl	1 2 3 4 5 6 7 8 9 10	Thallium - Tl	1 2 3 4 5 6 7 8 9 10	GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10	Diss - Uranium - U	1 2 3 4 5 6 7 8 9 10	Uranium - U	1 2 3 4 5 6 7 8 9 10		
Finger Print	1 2 3 4 5 6 7 8 9 10	Diss - Vanadium - V	1 2 3 4 5 6 7 8 9 10	Vanadium - V	1 2 3 4 5 6 7 8 9 10	GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10	Diss - Zinc - Zn	1 2 3 4 5 6 7 8 9 10	Zinc - Zn	1 2 3 4 5 6 7 8 9 10		
METALS CHEMISTRY PACKAGES		Diss - Calcium - Ca	1 2 3 4 5 6 7 8 9 10	Calcium - Ca	1 2 3 4 5 6 7 8 9 10	GA Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
OpMemo2 - Total	1 2 3 4 5 6 7 8 9 10	Diss - Potassium - K	1 2 3 4 5 6 7 8 9 10	Potassium - K	1 2 3 4 5 6 7 8 9 10	GA Ammonia - NH3	1 2 3 4 5 6 7 8 9 10
OpMemo2 - Dissolved (Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	1 2 3 4 5 6 7 8 9 10	Diss - Magnesium - Mg	1 2 3 4 5 6 7 8 9 10	Magnesium - Mg	1 2 3 4 5 6 7 8 9 10	GA Nitrate+Nitrite - NO3+NO2	1 2 3 4 5 6 7 8 9 10
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10	Diss - Sodium - Na	1 2 3 4 5 6 7 8 9 10	Sodium - Na	1 2 3 4 5 6 7 8 9 10	GA Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved (As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	1 2 3 4 5 6 7 8 9 10	Diss - Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10	Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10	GA Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10
		MD - Metals Dissolved		**LHG - Low Level Mercury**			
		Lab Filtration	1 2 3 4 5 6 7 8 9 10	Mercury Low Level - Hg	1 2 3 4 5 6 7 8 9 10		

Chain of Custody	Relinquished by	Received By	Date / Time
	Print Name & Org: Jeff Pincumbe - MDEQ	DALE CORSI - DLZ	3/24/17 1025
	Signature: [signature]	Dale J. Corsi	
	Print Name & Org: DALE CORSI	MARK JORDAN	3/24/17 1504
	Signature: Dale J. Corsi	[signature]	
	Print Name & Org: MARK JORDAN 3/24/17 1515	[signature]	3-25-17 940
	Signature: [signature]	[signature]	

Analysis Request Sheet

SAFETY INFORMATION

(MUST BE COMPLETED PRIOR TO SAMPLE SUBMITTAL)

Are samples expected to contain cyanide (CN)	YES ☐	NO ☐
Are samples expected to be flammable	YES ☐	NO ☐
Are samples acidic prior to preservation (pH < 2)	YES ☐	NO ☐
Are samples caustic prior to preservation (pH > 12)	YES ☐	NO ☐
Are samples expected to be Biohazardous	YES ☐	NO ☐
Are samples expected to be reactive with water or acid	YES ☐	NO ☐
Are samples expected to be radioactive	YES ☐	NO ☐
Are samples expected to contain dioxin	YES ☐	NO ☐
Are samples expected to be explosive	YES ☐	NO ☐
Were samples pre-preserved	YES ☐	NO ☐

List additional suspected sample hazard information below

MDEQ PRESERVATIVE TRACKING NUMBERS

VOA - HCL		CA - $MgCO_3$	
VOA - MeOH		MA/MAD - HNO_3	
GA - H_2SO_4		GCN - NaOH	
GB - NaOH		GCN - $PbCO_3$	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Samp

320-26905 Field Sheet

Job:

Tracking # 6289076946 04

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:

Therm. ID: AK-1 / AK-2 / HACCP /Other

Ice X Wet X Dry Other

Cooler Custody Seal: 836012

Sample Custody Seal: —

Cooler ID: 1 of 2

Temp: Observed 1.0

Corrected: 1.3

From: Temp Blank ☐ Sample ☑

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☐
CoC is complete w/o discrepancies?	☐	☐	☐
Samples received within holding time?	☐	☐	☐
Sample preservatives verified?	☐	☐	☐
Cooler compromised/tampered with?	☐	☐	☐
Samples compromised/tampered with?	☐	☐	☐
COC and Samples w/o discrepancies?	☐	☐	☐
Sample containers have legible labels?	☐	☐	☐
Containers are not broken or leaking?	☐	☐	☐
Sample date/times are provided.	☐	☐	☐
Appropriate containers are used?	☐	☐	☐
Sample bottles are completely filled?	☐	☐	☐
Zero headspace?*	☐	☐	☐
Multiphasic samples are not present?	☐	☐	☐

Initials: AV Date: 5-25-17

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Login Sample Receipt Checklist

Client: Michigan Dept. of Environmental Quality

Job Number: 320-26905-1

Login Number: 26905
List Number: 1
Creator: Turpen, Troy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	836012
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-79502-1
Client Project/Site: Loud Drive PCE - 3500058

For:
Michigan Dept. of Environmental Quality
Constitution Hall 3rd floor SW
525 W. Allegan Street
Lansing, Michigan 48909

Attn: Bob Delaney

Kris Brooks

Authorized for release by:
5/31/2017 12:28:47 PM

Kris Brooks, Project Manager II
(330)966-9790
kris.brooks@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Method Summary 6
Sample Summary 7
Detection Summary 8
Client Sample Results 9
QC Sample Results 10
QC Association Summary 13
Lab Chronicle 14
Certification Summary 15
Chain of Custody 17
Receipt Checklists 20
Isotope Dilution Summary 21

Definitions/Glossary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
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)

Job ID: 240-79502-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Michigan Dept. of Environmental Quality

Project: Loud Drive PCE - 3500058

Report Number: 240-79502-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The Perfluorinated Hydrocarbons analysis was performed at the TestAmerica Sacramento Laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT
The sample was received on 5/12/2017 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

PERFLUORINATED HYDROCARBONS
Sample LD-MW-3 (240-79502-1) was analyzed for Perfluorinated Hydrocarbons in accordance with SOP WS-OC-0025. The sample was prepared on 05/23/2017 and analyzed on 05/25/2017.

Perfluorooctane Sulfonamide (FOSA) was detected in method blank MB 320-165656/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Perfluorobutanoic acid (PFBA), Perfluoro-n-hexadecanoic acid (PFHxDA) and Perfluorotetradecanoic acid (PFTeA) were detected in method blank MB 320-165656/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The method blank for preparation batch 320-165656 and analytical batch 320-166362 contained Perfluorooctane Sulfonamide (FOSA)

Job ID: 240-79502-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

above the reporting limit (RL). This target analyte was not detected in the associated samples; therefore, re-extraction and/or re-analysis of samples was not performed.
LD-MW-3 (240-79502-1) and (MB 320-165656/1-A)

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit for 13C8 FOSA: LD-MW-3 (240-79502-1), (LCS 320-165656/2-A), (LCSD 320-165656/3-A) and (MB 320-165656/1-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. All detection limits are below the lower calibration.

The following sample: LD-MW-3 (240-79502-1) was decanted prior to preparation due to having sediment in the samples.

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

Method Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-79502-1	LD-MW-3	Water	05/09/17 00:00	05/12/17 09:30

Detection Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Client Sample ID: LD-MW-3 — Lab Sample ID: 240-79502-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.4	J B	1.9	0.43	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.9		1.9	0.94	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.2		1.9	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.0		1.9	0.71	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.60	J B	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.35	J B	1.9	0.12	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.9	0.87	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.6		1.9	0.82	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Client Sample ID: LD-MW-3
Date Collected: 05/09/17 00:00
Date Received: 05/12/17 09:30

Lab Sample ID: 240-79502-1
Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.4	J B	1.9	0.43	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoropentanoic acid (PFPeA)	1.9		1.9	0.94	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorohexanoic acid (PFHxA)	2.2		1.9	0.74	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.76	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorooctanoic acid (PFOA)	3.0		1.9	0.71	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.62	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.42	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.71	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.55	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.52	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorotetradecanoic acid (PFTeA)	0.60	J B	1.9	0.19	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.35	J B	1.9	0.12	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		1.9	0.64	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.9	0.87	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorohexanesulfonic acid (PFHxS)	2.6		1.9	0.82	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.67	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	1.1	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorooctane Sulfonate (PFOS)	ND		1.9	1.2	ng/L		05/23/17 08:00	05/25/17 21:38	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.9	0.60	ng/L		05/23/17 08:00	05/25/17 21:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*2*	*	*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C4 PFBA	*34*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C2 PFHxA	*67*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C4 PFOA	*65*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C5 PFNA	*54*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C2 PFDA	*62*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C2 PFUnA	*71*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C2 PFDoA	*83*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
18O2 PFHxS	*90*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C4 PFOS	*100*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C4-PFHpA	*76*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*
13C5-PFPeA	*68*		*25 - 150*	*05/23/17 08:00*	*05/25/17 21:38*	*1*

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-165656/1-A
Matrix: Water
Analysis Batch: 166362

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 165656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.478	J	2.0	0.46	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.99	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.79	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.75	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.44	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.75	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.58	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	0.55	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorotetradecanoic acid (PFTeA)	0.948	J	2.0	0.20	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.324	J	2.0	0.12	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoro-n-octadecanoic acid (PFODA)	ND		2.0	0.67	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.71	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	1.2	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorooctane Sulfonate (PFOS)	ND		2.0	1.3	ng/L		05/23/17 08:00	05/25/17 18:24	1
Perfluorooctane Sulfonamide (FOSA)	2.53		2.0	0.64	ng/L		05/23/17 08:00	05/25/17 18:24	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*24*	*	*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C4 PFBA	*104*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C2 PFHxA	*104*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C4 PFOA	*117*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C5 PFNA	*120*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C2 PFDA	*128*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C2 PFUnA	*130*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C2 PFDoA	*124*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
18O2 PFHxS	*100*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C4 PFOS	*99*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C4-PFHpA	*116*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*
13C5-PFPeA	*117*		*25 - 150*	*05/23/17 08:00*	*05/25/17 18:24*	*1*

Lab Sample ID: LCS 320-165656/2-A
Matrix: Water
Analysis Batch: 166362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 165656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.7		ng/L		99	74 - 138
Perfluoropentanoic acid (PFPeA)	40.0	39.6		ng/L		99	69 - 134
Perfluorohexanoic acid (PFHxA)	40.0	38.9		ng/L		97	70 - 136
Perfluoroheptanoic acid (PFHpA)	40.0	40.0		ng/L		100	63 - 135
Perfluorooctanoic acid (PFOA)	40.0	38.4		ng/L		96	63 - 141
Perfluorononanoic acid (PFNA)	40.0	39.2		ng/L		98	71 - 140
Perfluorodecanoic acid (PFDA)	40.0	39.4		ng/L		99	66 - 141

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-165656/2-A
Matrix: Water
Analysis Batch: 166362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 165656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroundecanoic acid (PFUnA)	40.0	37.4		ng/L		93	68 - 139
Perfluorododecanoic acid (PFDoA)	40.0	39.3		ng/L		98	71 - 139
Perfluorotridecanoic Acid (PFTriA)	40.0	44.1		ng/L		110	51 - 139
Perfluorotetradecanoic acid (PFTeA)	40.0	49.9		ng/L		125	47 - 130
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	39.8		ng/L		99	50 - 150
Perfluoro-n-octadecanoic acid (PFODA)	40.0	47.3		ng/L		118	50 - 150
Perfluorobutanesulfonic acid (PFBS)	35.4	38.2		ng/L		108	55 - 147
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.7		ng/L		93	58 - 138
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.9		ng/L		100	32 - 170
Perfluorodecanesulfonic acid (PFDS)	38.6	37.6		ng/L		98	35 - 157
Perfluorooctane Sulfonate (PFOS)	37.1	34.4		ng/L		93	47 - 162
Perfluorooctane Sulfonamide (FOSA)	40.0	39.7		ng/L		99	59 - 163

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*6*	*	*25 - 150*
13C4 PFBA	*95*		*25 - 150*
13C2 PFHxA	*93*		*25 - 150*
13C4 PFOA	*104*		*25 - 150*
13C5 PFNA	*105*		*25 - 150*
13C2 PFDA	*117*		*25 - 150*
13C2 PFUnA	*116*		*25 - 150*
13C2 PFDoA	*116*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*94*		*25 - 150*
13C4-PFHpA	*109*		*25 - 150*
13C5-PFPeA	*105*		*25 - 150*

Lab Sample ID: LCSD 320-165656/3-A
Matrix: Water
Analysis Batch: 166362

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 165656

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	41.6		ng/L		104	74 - 138	5	30
Perfluoropentanoic acid (PFPeA)	40.0	38.6		ng/L		97	69 - 134	2	30
Perfluorohexanoic acid (PFHxA)	40.0	39.7		ng/L		99	70 - 136	2	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.2		ng/L		98	63 - 135	2	30
Perfluorooctanoic acid (PFOA)	40.0	39.8		ng/L		99	63 - 141	4	30
Perfluorononanoic acid (PFNA)	40.0	40.0		ng/L		100	71 - 140	2	30
Perfluorodecanoic acid (PFDA)	40.0	40.0		ng/L		100	66 - 141	1	30

QC Sample Results

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-165656/3-A
Matrix: Water
Analysis Batch: 166362

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 165656

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroundecanoic acid (PFUnA)	40.0	37.3		ng/L		93	68 - 139	0	30
Perfluorododecanoic acid (PFDoA)	40.0	40.4		ng/L		101	71 - 139	3	30
Perfluorotridecanoic Acid (PFTriA)	40.0	45.3		ng/L		113	51 - 139	3	30
Perfluorotetradecanoic acid (PFTeA)	40.0	50.5		ng/L		126	47 - 130	1	30
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	41.9		ng/L		105	50 - 150	5	30
Perfluoro-n-octadecanoic acid (PFODA)	40.0	44.7		ng/L		112	50 - 150	6	30
Perfluorobutanesulfonic acid (PFBS)	35.4	40.2		ng/L		114	55 - 147	5	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.4		ng/L		97	58 - 138	5	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.4		ng/L		101	32 - 170	1	30
Perfluorodecanesulfonic acid (PFDS)	38.6	40.5		ng/L		105	35 - 157	7	30
Perfluorooctane Sulfonate (PFOS)	37.1	35.4		ng/L		95	47 - 162	3	30
Perfluorooctane Sulfonamide (FOSA)	40.0	40.0		ng/L		100	59 - 163	1	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*21*	*	*25 - 150*
13C4 PFBA	*98*		*25 - 150*
13C2 PFHxA	*99*		*25 - 150*
13C4 PFOA	*107*		*25 - 150*
13C5 PFNA	*108*		*25 - 150*
13C2 PFDA	*121*		*25 - 150*
13C2 PFUnA	*118*		*25 - 150*
13C2 PFDoA	*117*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*97*		*25 - 150*
13C4-PFHpA	*112*		*25 - 150*
13C5-PFPeA	*113*		*25 - 150*

QC Association Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

LCMS

Prep Batch: 165656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-79502-1	LD-MW-3	Total/NA	Water	3535	
MB 320-165656/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-165656/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-165656/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 166362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-79502-1	LD-MW-3	Total/NA	Water	537 (modified)	165656
MB 320-165656/1-A	Method Blank	Total/NA	Water	537 (modified)	165656
LCS 320-165656/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	165656
LCSD 320-165656/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	165656

Lab Chronicle

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Client Sample ID: LD-MW-3
Date Collected: 05/09/17 00:00
Date Received: 05/12/17 09:30

Lab Sample ID: 240-79502-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			165656	05/23/17 08:00	J1S	TAL SAC
Total/NA	Analysis	537 (modified)		1	166362	05/25/17 21:38	CBW	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Laboratory: TestAmerica Canton

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
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17 *
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-17 *
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-17
Wisconsin	State Program	5	999518190	08-31-17 *

Laboratory: TestAmerica Sacramento

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
Alaska (UST)	State Program	10	UST-055	12-18-17
Arizona	State Program	9	AZ0708	08-11-17
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-17
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-17
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-17
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	10-31-17
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Laboratory: TestAmerica Sacramento (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
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-29-17 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

DEQ 1.4/Ki.1

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Lab Work Order Number	Project Name	Matrix
	Loud Drive PCE	WATER

Site Code/Project Number: 35000152	AY: 17	CC Email 1: pincumbej	Project TAT Days:	Sample Collector: Jeff Pincumbe
Dept-Division-District: DEQ-RRD-Saginaw bay	Index: 44031	CC Email 2: shireyb	Project Due Date:	Sample Collector Phone: 517-335-6418
State Project Manager: Mike Jury	PCA: 30740	CC Email 3:		Contract Firm:
State Project Manager Email: juerym1	Project: 457179	Overflow Lab Choice 1:	Accept Analysis hold time codes:	Contract Firm Primary Contact:
State Project Manager Phone: 989-894-6255	Phase: 00	Overflow Lab Choice 2:		Primary Contact Phone:

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1		~~[illegible]~~ Inf LD-MW-3	5-9-17			PFC
2						
3						
4						
5						
6						
7						
8						
9						
10						

240-79502 Chain of Custody

ORGANIC CHEMISTRY	
VOA - Volatile Organic Acidic	
Volatiles - Full List	1 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10
METH - Methane, Ethane, Ethene	
Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10
ON - Pesticides, PCBs	
Pesticides & PCBs	1 2 3 4 5 6 7 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10
PCBs only	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10
BNA - Base Neutral Acids	
BNAs	1 2 3 4 5 6 7 8 9 10
Benzidines	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10
Acids only	1 2 3 4 5 6 7 8 9 10
Organic Specialty Requests	
Library search - Volatiles	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10
METALS CHEMISTRY PACKAGES	
OpMemo2 - Total	1 2 3 4 5 6 7 8 9 10
OpMemo2 - Dissolved (Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	1 2 3 4 5 6 7 8 9 10
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved (As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	1 2 3 4 5 6 7 8 9 10

MAD - DISSOLVED METALS	
Diss - Silver - Ag	1 2 3 4 5 6 7 8 9 10
Diss - Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Diss - Arsenic - As	1 2 3 4 5 6 7 8 9 10
Diss - Boron - B	1 2 3 4 5 6 7 8 9 10
Diss - Barium - Ba	1 2 3 4 5 6 7 8 9 10
Diss - Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Diss - Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Diss - Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Diss - Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Diss - Copper - Cu	1 2 3 4 5 6 7 8 9 10
Diss - Iron - Fe	1 2 3 4 5 6 7 8 9 10
Diss - Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Diss - Lithium - Li	1 2 3 4 5 6 7 8 9 10
Diss - Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Diss - Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Diss - Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Diss - Lead - Pb	1 2 3 4 5 6 7 8 9 10
Diss - Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Diss - Selenium - Se	1 2 3 4 5 6 7 8 9 10
Diss - Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Diss - Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Diss - Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Diss - Uranium - U	1 2 3 4 5 6 7 8 9 10
Diss - Vanadium - V	1 2 3 4 5 6 7 8 9 10
Diss - Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Diss - Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Diss - Potassium - K	1 2 3 4 5 6 7 8 9 10
Diss - Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Diss - Sodium - Na	1 2 3 4 5 6 7 8 9 10
Diss - Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
MD - Metals Dissolved	
Lab Filtration	1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS	
Silver - Ag	1 2 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Boron - B	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10
Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
LHG - Low Level Mercury	
Mercury Low Level - Hg	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY	
GB Total Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GB Amenable Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GCN Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
CA Chlorophyll	1 2 3 4 5 6 7 8 9 10
GN Ortho Phosphate - OP	1 2 3 4 5 6 7 8 9 10
GN Nitrite - NO_2	1 2 3 4 5 6 7 8 9 10
GN Nitrate - NO_3 (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Suspended Solids - SS	1 2 3 4 5 6 7 8 9 10
GN Dissolved Solids - TDS	1 2 3 4 5 6 7 8 9 10
MN Diss Solids - TDS (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Turbidity	1 2 3 4 5 6 7 8 9 10
MN Total Alkalinity	1 2 3 4 5 6 7 8 9 10
MN Bicarb/Carb Alkalinity (includes Total Alkalinity)	1 2 3 4 5 6 7 8 9 10
MN Chloride - Cl	1 2 3 4 5 6 7 8 9 10
MN Fluoride - F	1 2 3 4 5 6 7 8 9 10
MN Sulfate - SO4	1 2 3 4 5 6 7 8 9 10
MN Chromium 6 - Cr+6	1 2 3 4 5 6 7 8 9 10
MN Conductivity	1 2 3 4 5 6 7 8 9 10
MN pH	1 2 3 4 5 6 7 8 9 10
GA Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GA Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
GA Ammonia - NH3	1 2 3 4 5 6 7 8 9 10
GA Nitrate+Nitrite - NO3+NO2	1 2 3 4 5 6 7 8 9 10
GA Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
GA Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished By	Received By	Date / Time
Print Name & Org.	Jeff Pincumbe - MDEQ	Jordan Hardy MDEQ	5/11/17 0836
Signature:	[signature]	[signature]	
Print Name & Org.	Melissa Smith	[signature]	5/11/17 1230
Signature:	[signature]		
Print Name & Org.	Gary Schuler TIA	[signature]	5-12-17 ~~1000~~ 930
Signature:	[signature] 14:10	—	

TestAmerica Canton Sample Receipt Form/Narrative Login # : 7945

Canton Facility

Client DEQ Site Name —

Cooler Received on 5-12-17 Opened on 5-12-17

Cooler unpacked by: POP

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

☐ See Multiple Cooler Form

1. Cooler temperature upon receipt
   IR GUN# IR-8 (CF -0.3 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.1 °C
   IR GUN #36 (CF +0.8°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 ~~Yes~~ No
   -Were custody seals on the outside of the cooler(s) signed & dated? ~~Yes~~ No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes ~~No~~
3. Shippers' packing slip attached to the cooler(s)? ~~Yes~~ No
4. Did custody papers accompany the sample(s)? ~~Yes~~ No
5. Were the custody papers relinquished & signed in the appropriate place? ~~Yes~~ No
6. Was/were the person(s) who collected the samples clearly identified on the COC? ~~Yes~~ No
7. Did all bottles arrive in good condition (Unbroken)? ~~Yes~~ No
8. Could all bottle labels be reconciled with the COC? ~~Yes~~ No
9. Were correct bottle(s) used for the test(s) indicated? ~~Yes~~ No
10. Sufficient quantity received to perform indicated analyses? ~~Yes~~ No
11. Are these work share samples? Yes ~~No~~
    If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? Yes No ~~NA~~ pH Strip Lot# HC697954
12. Were VOAs on the COC? Yes ~~No~~
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No ~~NA~~
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ Yes ~~No~~
15. Was a LL Hg or Me Hg trip blank present? ____ Yes ~~No~~

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

No sample time on COC or Bottle - HRM

17. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

Ref: SOP NC-SC-0005, Sample Receiving

\\tacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-042717 Cooler Receipt Form.doc djl

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record

TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-70535.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kris.brooks@testamericainc.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-79502-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 6/6/2017			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Wurtsmith - 3500058	Project #: 24006344			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA3535_PFC (MOD) PFC expanded list	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
LD-MW-3 (240-79502-1)	5/9/17	Eastern		Water			X	2	NCM E flags, NCM any re-analyses & why. Try for MB<1/2 RL

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5/12/17 1550			5/13/17 1130	TAWS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3-9

Login Sample Receipt Checklist

Client: Michigan Dept. of Environmental Quality

Job Number: 240-79502-1

Login Number: 79502
List Number: 2
Creator: Edman, Connor M

List Source: TestAmerica Sacramento
List Creation: 05/15/17 11:27 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Isotope Dilution Summary

Client: Michigan Dept. of Environmental Quality
Project/Site: Loud Drive PCE - 3500058

TestAmerica Job ID: 240-79502-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOS/ (25-150)	3C4 PFB/ (25-150)	3C2 PFHx (25-150)	3C4 PFO/ (25-150)	3C5 PFN/ (25-150)	3C2 PFD/ (25-150)	3C2 PFUn (25-150)	3C2 PFDo (25-150)
240-79502-1	LD-MW-3	2 *	34	67	65	54	62	71	83
LCS 320-165656/2-A	Lab Control Sample	6 *	95	93	104	105	117	116	116
LCSD 320-165656/3-A	Lab Control Sample Dup	21 *	98	99	107	108	121	118	117
MB 320-165656/1-A	Method Blank	24 *	104	104	117	120	128	130	124

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	8O2 PFHx (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5-PFPe (25-150)
240-79502-1	LD-MW-3	90	100	76	68
LCS 320-165656/2-A	Lab Control Sample	91	94	109	105
LCSD 320-165656/3-A	Lab Control Sample Dup	91	97	112	113
MB 320-165656/1-A	Method Blank	100	99	116	117

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5-PFPeA = 13C5-PFPeA