

July 17, 2019

Mr. Tom Hutchings

City of Flint Water Pollution
Water Pollution Control Facilities
G4652 Beecher Rd.
Flint, MI, 48532

RE: **Discharge Permit Submittal- April 2019 through June 2019**

Permit No.: 6-08-04-04-GML1

FILE: 15388/72202/Docs

Dear **Mr. Hutchings**:

In accordance with requirements of the above referenced discharge permit, we are providing you with the following discharge information for the period April 1, 2019 to June 30, 2019 for the Coldwater Road Landfill facility, located at 6220 Horton Avenue, Flint, Michigan. In addition, we have reported the performance of the per- and polyfluoroalkyl substances (PFAS) pretreatment system in this letter and will continue to do so as long as the pretreatment system is in operation.

- Periodic Report on Continued Compliance, certification
- Periodic Report on Continued Compliance and GSWVR Sample (Table 1)
- Daily Discharge Summary Table (Table 2)
- PFAS Sampling Results Table (Table 3)
- Analytical Reports provided by Merit Laboratories, Inc. for samples from the on-Site, above ground collection tank collected on April 1, 2019.
- Analytical Reports provided by Merit Laboratories, Inc. for samples from the on-Site, PFAS pretreatment system collected on April 23, 2019, April 24, 2019, April 25, 2019, April 26, 2019, May 1, 2019, and May 22, 2019 during the discharge of the liquids from the on-Site, above ground collection tank through the system.
- Copy of Chain-of-Custody forms.

The laboratory analytical results indicate concentrations were below the Sewer Use Permit limits for the parameters analyzed for the water discharged to the POTW during the discharge period.

On April 16, 2019 a variance for discharging groundwater was requested from the City of Flint due to the commingling of groundwater with the permitted leachate and leak detection water due to the need for storage of development water from a new residential well installed as part of the environmental response activities at the site. The groundwater from the well development contained PFAS and in particular PFOS at concentrations (up to 26 ng/l), exceeding surface water within criteria of 12 ng/l, and therefore had to be contained.

To comply with the City of Flint Publicly-Owned Treatment Works Regulations Discharge Prohibitions and Limits additional analytes (Benzene, Cadmium, Ethylbenzene, Lead, Polychlorinated biphenyls (PCBs), Silver, p,m-Xylene, and o-Xylene) were added to the sample collected on April 1, 2019 (Table 1). A discharge variance for 100,000 gallons was approved on April 22, 2019, and a second variance for an additional 150,000 gallons was approved on April 29, 2019.



The water was pumped into the accumulation tank through the existing piping and then discharged through the existing discharge piping, flow meter, and pretreatment system utilized to remove sediment and PFOS from the discharged water. The PFAS impacted groundwater along with the permitted leachate was discharged from April 23, 2019 to May 22, 2019 and a total of 138,477 gallons were discharged at a daily average of 4,757.4 gallons (Table 2).

The PFAS analytical results indicate that the PFAS pretreatment system reduced PFAS concentrations to non-detectable concentrations, which are below the current MDEQ Part 4, Water Quality Standards, Rule 57 Water Quality Values. Therefore, the PFAS pretreatment system is operating as designed.

Breakthrough analysis samples were collected to evaluate the adsorption capacity of the first and second granular activated carbon (GAC) drums. The breakthrough analysis samples from the primary GAC drum indicated some breakthrough, which increased over the first two samples collected as indicated in the sample collected on April 25, 2019, (the 237th bed volume [approximately 10,665 gallons] sample). The end of discharge sample, at 3,077th bed volume (138,465 gallons), had a lower PFAS concentration.

The breakthrough analysis on the first mid-fluent (Mid-1) or secondary GAC drum, second mid-fluent (Mid-2) or tertiary (third) GAC drum, and the effluent sample (after the quaternary [fourth] GAC drum) at the end of discharge on May 22, 2019 at the 3,077th bed volume (138,465 gallons), did not indicate breakthrough. Therefore, the primary drum was still protecting the subsequent GAC drums from receiving the full influent PFAS concentrations in the tank liquids.

Due to the amount of sediment in the discharge water (from the development water) the primary and secondary drums were removed from the system and replaced with the tertiary (third) and quaternary (fourth) drums, respectively, and new GAC drums were placed in the tertiary and quaternary GAC drum positions within the approved four-drum pretreatment system to be used during subsequent discharge events.

Please call me at 313-333-0211 if you have any questions.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.



Clifford S. Yantz
Senior Hydrogeologist

cc: Mr. Kevin Forbes – Beecher Metropolitan District, Flint, MI
Mr. Richard Conforti – MDEQ (via email)
Mr. Grant Trigger – RACER Trust
Mr. David Favero – RACER Trust
Mr. Kevin Schneider – O'Brien & Gere

City of Flint Industrial Pretreatment Program

Periodic Report on Continued Compliance

Company Name: RACER Trust, Coldwater Road
Street Address: 6220 Horton Avenue, Flint, Michigan
Permit Number: 6-08-04-04-GML1
Outfall Number: 001

Reporting Period: April 1, 2019 through June 30, 2019

Average Volume of Daily Discharge (during reporting period): 4,757.4 gallons
(Continuous Discharge for 30 Days)

Complete the following:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name of Authorized Representative: Clifford Yantz

Title of Authorized Representative: Senior Hydrogeologist, O'Brien & Gere Engineers, Inc.
As agent for the RACER Trust

Signature of Authorized Representative: 

Date Signed by Authorized Representative: 7/17/19

If required to implement a Toxic Organics Management Plan (TOMP), complete the following:

"Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last Periodic Report on Continued Compliance. I further certify that, this facility is implementing the toxic organic management plan submitted to the control authority."

Name of Authorized Representative: N/A

Title of Authorized Representative: N/A

Signature of Authorized Representative: N/A

Date Signed by Authorized Representative: N/A

Table 1
Periodic Report on Continued Compliance
City of Flint Sewer User Self-Monitoring Report
Second Quarter - 2019 - GSWVR Sample

RACER Trust - Coldwater Road Landfill Facility						
Permit Number 6-08-04-04-GML1						
6220 Horton Avenue						
Analytical Parameter	Ammonia-N	BOD5	HEM	pH @ 25°C	Phosphorus	TSS
Units	mg/L	mg/L	mg/L	SU	mg/L	mg/L
Sampling Frequency	Per Batch	Per Batch	Per Batch	Per Batch	Per Batch	Per Batch
Sampling Procedure	Grab sample	Grab sample	Grab sample	Grab sample	Grab sample	Grab sample
Daily Maximum Limit	110	1196	100	NA	14	570
Maximum Limit	NA	NA	NA	10.5	NA	NA
Minimum Limit	NA	NA	NA	6	NA	NA
Test Result	0.21	<3	<2	7.4	0.09	94
Test Method	4500-NH3 D	10360	1664A	4500-H+ B	4500-PE	2540 D
Test Date	4/2/2019	4/8/2019	4/4/2019	4/1/2019	4/3/2019	4/4/2019
Sample Date	4/1/2019	4/1/2019	4/1/2019	4/1/2019	4/1/2019	4/1/2019
Sample Type	wastewater	wastewater	wastewater	wastewater	wastewater	wastewater
Test Result						
Test Method						
Test Date						
Sample Date						
Sample Type						
Test Result						
Test Method						
Test Date						
Sample Date						
Sample Type						
Average Daily Conc.						
No. of Samples						
Number of Limit Exceedances						

Table 1
Periodic Report on Continued Compliance
City of Flint Sewer User Self-Monitoring Report
Second Quarter - 2019 - GSWVR Sample

RACER Trust - Coldwater Road Landfill Facility							
Permit Number 6-08-04-04-GML1							
6220 Horton Avenue							
Analytical Parameter	Arsenic	Chromium	Copper	Mercury	Nickel	Zinc	Cyanide, available
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Sampling Frequency	Per Batch	Per Batch	Per Batch	Per Batch	Per Batch	Per Batch	Per Batch
Sampling Procedure	Grab sample	Grab sample	Grab sample	Grab sample	Grab sample	Grab sample	Grab sample
Daily Maximum Limit	0.051	1.273	1.797	0.000012	0.543	2.626	0.165
Maximum Limit	NA	NA	NA	NA	NA	NA	NA
Minimum Limit	NA	NA	NA	NA	NA	NA	NA
Test Result	0.008	0.028	0.035	<0.0002	0.013	0.01	<0.002
Test Method	200.8	200.8	200.8	245.1	200.8	200.8	1677
Test Date	4/2/2019	4/2/2019	4/2/2019	4/8/2019	4/2/2019	4/2/2019	4/4/2019
Sample Date	4/1/2019	4/1/2019	4/1/2019	4/1/2019	4/1/2019	4/1/2019	4/1/2019
Sample Type	wastewater	wastewater	wastewater	wastewater	wastewater	wastewater	wastewater
Test Result							
Test Method							
Test Date							
Sample Date							
Sample Type							
Test Result							
Test Method							
Test Date							
Sample Date							
Sample Type							
Average Daily Conc.							
No. of Samples							
Number of Limit Exceedances							

Table 1
Periodic Report on Continued Compliance
City of Flint Sewer User Self-Monitoring Report
Second Quarter - 2019 - GSWVR Sample

RACER Trust - Coldwater Road Landfill Facility			
Permit Number 6-08-04-04-GML1			
6220 Horton Avenue			
Analytical Parameter	Cadmium	Lead	Silver
Units	mg/L	mg/L	mg/L
Sampling Frequency	Per Batch	Per Batch	Per Batch
Sampling Procedure	Grab sample	Grab sample	Grab sample
Daily Maximum Limit	0.044	0.247	0.019
Maximum Limit	NA	NA	NA
Minimum Limit	NA	NA	NA
Test Result	<0.0005	0.004	<0.0005
Test Method	200.8	200.8	200.8
Test Date	4/2/2019	4/2/2019	4/2/2019
Sample Date	4/1/2019	4/1/2019	4/1/2019
Sample Type	wastewater	wastewater	wastewater
Test Result			
Test Method			
Test Date			
Sample Date			
Sample Type			
Test Result			
Test Method			
Test Date			
Sample Date			
Sample Type			
Average Daily Conc.			
No. of Samples			
Number of Limit Exceedances			

TABLE 1
RACER Trust - Coldwater Road Landfill
GSWVR Sample Results (PFAS, PCBs, and BETX)

Coldwater Road Landfill - PFAS Pretreatment System Samples

Perfluorinated Compound (ng/l)	Well/Sample ID:	1278 E. Stanley-	PCBs (µg/l)	02-PRCC-19	BETX (µg/l)	02-PRCC-19	02-PRCC-19
		RW-040919					
	Sample Date:	4/1/2019		4/1/2019		4/1/2019	4/1/2019
Perfluorobutanoic Acid (PFBA)		<19	PCB-1016	<0.1	Benzene	<1	<20
Perfluoropentanoic Acid (PFPeA)		<9.7	PCB-1221	<0.1	Toluene	<1	<10
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		<9.7	PCB-1232	<0.1	Ethylbenzene	<1	<10
Perfluorohexanoic Acid (PFHxA)		<9.7	PCB-1242	<0.1	p,m-Xylene	<2	<10
Perfluorobutane Sulfonic Acid (PFBS)		<9.7	PCB-1248	<0.1	o-Xylene	<1	<10
Perfluoroheptanoic Acid (PFHpA)		<9.7	PCB-1254	<0.1			<10
Perfluoropentane Sulfonic Acid (PFPeS)		<9.7	PCB-1260	<0.1			<10
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		<9.7	<i>PCB, Total</i>	<i><0.1</i>			<10
Perfluorooctanoic Acid (PFOA)		<9.7					<10
Perfluorohexane Sulfonic Acid (PFHxS)		<9.7					<10
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		<9.7					<10
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		<9.7					<10
Perfluorononanoic Acid (PFNA)		<9.7					<10
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		<9.7					<10
Perfluoroheptane Sulfonic Acid (PFHpS)		<9.7					<10
Perfluorodecanoic Acid (PFDA)		<9.7					<10
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		<9.7					<10
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		<9.7					<10
Perfluorooctane Sulfonic Acid (PFOS)		26					<10
Perfluorooctane Sulfonic Acid (PFOS -LN)		<9.7					<10
Perfluorooctane Sulfonic Acid (PFOS -BR)		<9.7					<10
Perfluoroundecanoic Acid (PFUnDA)		<9.7					<10
Perfluorononane Sulfonic Acid (PFNS)		<9.7					<10
Perfluorododecanoic Acid (PFDoDA)		<9.7					<10
Perfluorodecane Sulfonic Acid (PFDS)		<9.7					<10
Perfluorotridecanoic Acid (PFTrDA)		<9.7					<10
Perfluorooctane Sulfonamide (FOSA)		<9.7					<10
Perfluorotetradecanoic Acid (PFTeDA)		<9.7					<10

Notes

- 1) Detections in **bold**.
- 3) < = Not detected at specified reporting limit.
- 5) Concentrations above the MDEQ Part 4, Water Quality Standards, Rule 57 Water Quality Value for PFOS of 11 ng/L for drinking water are highlighted in yellow.



**Table 2
Coldwater Road Landfill
Daily Discharge Summary Table
Second Quarter - 2019
6-08-04-04-GML1**

Date	Beginning Flow Meter Reading	End Flow Meter Reading	Gallons Discharged	Begin Time of Discharge	End Time of Discharge	Average Flow (gal/min)	Temperature at Discharge		pH
							(C)	(F)	
4/23/2019	569,739	Continuous Discharge		7:00	Continuous Discharge		14.0	57.2	7.50
5/22/2019	Continuous Discharge	708,216	138,477	Continuous Discharge	9:35	3.3	15.0	59.0	7.70

Total Discharge Volume (30 Days; Gallons): 138,477
Average Discharge Flow Rate (30 Days; GPM): 3.30
Average Daily Discharge Volume (30 Days; Gallons): 4757.4

NOTES :

TABLE 3
RACER Trust - Coldwater Road Landfill
Per- and Polyfluoroalkyl Substances (PFAS) Sampling Results

Coldwater Road Landfill - PFAS Pretreatment System Samples

Perfluorinated Compound	Well/Sample ID: 02-PRCC-19-Inf (Influent Sample)	02-PRCC-19-Prim-120	02-PRCC-19-Prim-237	02-PRCC-19-Prim-344	02-PRCC-19-Prim-865	02-PRCC-19-Prim-3077	02-PRCC-19-Mid-1-120	02-PRCC-19-Mid-1-237	02-PRCC-19-Mid-1-344	02-PRCC-19-Mid-1-865	02-PRCC-19-Mid-1-3077	02-PRCC-19-Mid-2-3077	02-PRCC-19-Eff-865	02-PRCC-19-Eff-3077	Field Blank-042319	Field Blank-052219
		(Primary GAC Drum Sample after 120 Bed Volumes)	(Primary GAC Drum Sample after 237 Bed Volumes)	(Primary GAC Drum Sample after 344 Bed Volumes)	(Primary GAC Drum Sample after 865 Bed Volumes)	(Primary GAC Drum Sample after 3077 Bed Volumes)	(Secondary GAC Drum Sample after 120 Bed Volumes)	(Secondary GAC Drum Sample after 237 Bed Volumes)	(Secondary GAC Drum Sample after 344 Bed Volumes)	(Secondary GAC Drum Sample after 865 Bed Volumes)	(Secondary GAC Drum Sample after 3077 Bed Volumes)	(Tertiary GAC Drum Sample after 3077 Bed Volumes)	(Effluent Sample after 865 Bed Volumes)	(Effluent Sample after 3077 Bed Volumes)	(Field Blank)	(Field Blank)
Sample Date:	4/23/2019	4/24/2019	4/25/2019	4/26/2019	5/1/2019	5/22/2019	4/24/2019	4/25/2019	4/26/2019	5/1/2019	5/22/2019	5/22/2019	5/1/2019	5/22/2019	4/23/2019	5/22/2019
Perfluorobutanoic Acid (PFBA)	<29	<20	<20	<20	<18	<19	<19	<20	<19	<19	<18	<18	<19	<19	<20	<21
Perfluoropentanoic Acid (PFPeA)	<11	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorohexanoic Acid (PFHxA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorobutane Sulfonic Acid (PFBS)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluoroheptanoic Acid (PFHpA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluoropentane Sulfonic Acid (PFPeS)	16	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorooctanoic Acid (PFOA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorohexane Sulfonic Acid (PFHxS)	53	<10	12	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)	45	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)	11	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorononanoic Acid (PFNA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluoroheptane Sulfonic Acid (PFHpS)	18	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorodecanoic Acid (PFDA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorooctane Sulfonic Acid (PFOS)	1300	110	130	93	20	24	20	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorooctane Sulfonic Acid (PFOS-LN)	820	54	67	45	<9.2	14	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorooctane Sulfonic Acid (PFOS-BR)	500	56	64	49	13	9.7	13	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluoroundecanoic Acid (PFUnDA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorononane Sulfonic Acid (PFNS)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorododecanoic Acid (PFDoDA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorodecane Sulfonic Acid (PFDS)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorotridecanoic Acid (PFTTrDA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorooctane Sulfonamide (FOSA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10
Perfluorotetradecanoic Acid (PFTeDA)	<10	<10	<9.9	<9.9	<9.2	<9.4	<9.6	<9.9	<9.5	<9.5	<9.1	<9.1	<9.6	<9.3	<10	<10

Notes

- 1) Detections in **bold**.
- 2) Concentrations in ng/L.
- 3) < = Not detected at specified reporting limit.
- 4) -- = Not analyzed.
- 5) Concentrations above the MDEQ Part 4, Water Quality Standards, Rule 57 Water Quality Value for PFOS of 11 ng/L for drinking water are highlighted in yellow.
- 6) Number after Prim (Primary GAC drum), Mid (Secondary GAC drum), and Eff (Effluent sample after tertiary GAC drum) samples equals number of GAC Bed volumes discharged through the pretreatment system at the time of sample collection. One bed volume equals 45 gallons.





Analytical Laboratory Report

Report ID: S00407.01(01)+QC01
Generated on 04/08/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S00407.01
Project: RACER Coldwater Rd Landfill
Collected Date: 04/01/2019
Submitted Date/Time: 04/01/2019 14:00
Sampled by: Kevin Schneider
P.O. #: 11800350

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
E1664A	EPA Method 1664 Revision A February 1999
E200.8	EPA Method 200.8 Revision 5.4
E245.1	EPA Method 245.1 Revision 3.0
E608.3	EPA Method 608.3 December 2016
HACH 10360	HACH 10360
N/A	Not Applicable
OIA-1677	EPA Method OIA-1677-09
SM2540D	Standard Method 2540 D 2011
SM2550B	Standard Method 2550 B 2011
SM4500-H+ B	Standard Method 4500 H + B 2011
SM4500-NH3 D	Standard Method 4500 NH3 D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003



Analytical Laboratory Report

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S00407.01	02-PRCC-19	Wastewater	04/01/19 11:45



Analytical Laboratory Report

Lab Sample ID: S00407.01

Sample Tag: 02-PRCC-19

Collected Date/Time: 04/01/2019 11:45

Matrix: Wastewater

COC Reference: 121781

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	4.3	IR
1	250ml Plastic	H2SO4	Yes	4.3	IR
1	125ml Amber	PbCO3/NaOH	Yes	4.3	IR
2	1L Plastic	None	Yes	4.3	IR
1	32oz Glass	HCL	Yes	4.3	IR
2	1L Amber	None	Yes	4.3	IR
3	40ml Glass	HCL	Yes	4.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	04/08/19 09:00	JRH	
TBOD5 - Set*	Completed	HACH 10360	04/03/19 11:30	ASB	
pH check for VOCs*	<2	N/A	04/02/19 12:50	JML	
Metal Digestion	Completed	SW3015A	04/02/19 14:00	CCM	
Extraction, PCB*	Completed	E608.3	04/04/19 11:07	ANW	

Inorganics

Method: E1664A, Run Date: 04/04/19 14:46, Analyst: ANW

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Oil & Grease n-Hexane Extract.	Not detected	2		mg/L	1		

Method: HACH 10360, Run Date: 04/08/19 12:24, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
TBOD5*	Not detected	3		mg/L	1.5		

Method: SM2540D, Run Date: 04/04/19 23:50, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	94	3		mg/L	2.22		

Method: SM2550B, Run Date: 04/01/19 11:45, Analyst: KS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Field Temperature*	46	1		oF	1		

Method: SM4500-H+ B, Run Date: 04/01/19 11:45, Analyst: KS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Field pH*	7.4	0.1		STD Units	1		

Method: SM4500-NH3 D, Run Date: 04/02/19 19:05, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)	0.21	0.02	0.003	mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 04/03/19 13:44, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.09	0.05	0.045	mg/L	5	7723-14-0	



Analytical Laboratory Report

Lab Sample ID: S00407.01 (continued)

Sample Tag: 02-PRCC-19

Metals

Method: E200.8, Run Date: 04/02/19 16:16, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.008	0.002		mg/L	5	7440-38-2	
Cadmium	Not detected	0.0005		mg/L	5	7440-43-9	
Chromium	0.028	0.005		mg/L	5	7440-47-3	
Copper	0.035	0.005		mg/L	5	7440-50-8	
Lead	0.004	0.003		mg/L	5	7439-92-1	
Nickel	0.013	0.005		mg/L	5	7440-02-0	
Silver	Not detected	0.0005		mg/L	5	7440-22-4	
Zinc	0.010	0.005		mg/L	5	7440-66-6	

Method: E245.1, Run Date: 04/08/19 12:52, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002		mg/L	1	7439-97-6	

Organics - PCBs/Pesticides

PCB, Method: E608.3, Run Date: 04/04/19 13:54, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	0.1		ug/L	1	12674-11-2	
PCB-1221	Not detected	0.1		ug/L	1	11104-28-2	
PCB-1232	Not detected	0.1		ug/L	1	11141-16-5	
PCB-1242	Not detected	0.1		ug/L	1	53469-21-9	
PCB-1248	Not detected	0.1		ug/L	1	12672-29-6	
PCB-1254	Not detected	0.1		ug/L	1	11097-69-1	
PCB-1260	Not detected	0.1		ug/L	1	11096-82-5	
PCB, Total*	Not detected	0.1		ug/L	1	1336-36-3	

Organics - Volatiles

BTEX, GC/MS, Method: SW5030C/8260C, Run Date: 04/03/19 16:35, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Benzene	Not detected	1		ug/L	1	71-43-2	
Toluene	Not detected	1		ug/L	1	108-88-3	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	

Other / Misc.

Method: OIA-1677, Run Date: 04/04/19 11:25, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Available Cyanide	Not detected	0.002	0.0015	mg/L	1	57-12-5	



Quality Control Report

Report ID: S00407.01(01)+QC01
Generated on 04/08/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S00407.01
Project: RACER Coldwater Rd Landfill
Submitted Date/Time: 04/01/2019 14:00
Sampled by: Kevin Schneider
P.O. #: 11800350

QC Report Sections

- Cover Page (Page 8)
- Analysis Summary (Page 9)
- Prep Batch Summary (Page 10)
- Surrogates per Lab Sample (Page 11)
- Surrogates per QC Sample (Pages 12-13)
- Internal Standards per Lab Sample (Page 14)
- Internal Standards per QC Sample (Page 15)
- Batch QC Results (Pages 16-25)

Report Flag Descriptions

- *: QC result is outside of indicated control limits
- W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S00407.01

Sample Tag: 02-PRCC-19

Collected Date/Time: 04/01/2019 11:45

Matrix: Wastewater

COC Reference: 121781

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 D	04/02/19 19:05	AMN190402QC	AMN190402QC	No	BLK/LCS/MS/DUP
Oil & Grease n-Hexane Extract.	E1664A	04/04/19 14:46	OGHEX190404W01	OGHEX190404W01	No	BLK/LCS
Total Phosphorus	SM4500-PE	04/03/19 13:44	PHS190403QC	PHS190403QC	No	BLK/LCS/MS/DUP
Total Suspended Solids	SM2540D	04/04/19 23:50	TSS190404	TSS190404	No	BLK/LCS/DUP
Metals						
Arsenic	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Cadmium	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Copper	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Lead	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Mercury	E245.1	04/08/19 12:52	HG2-19-0408A	HGD-040819-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Silver	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Zinc	E200.8	04/02/19 16:16	MT4-19-0402B	MTD-040219-2	No	BLK/LCS/MS/MSD
Organics - PCBs/Pesticides						
PCB	E608.3	04/04/19 13:54	A190404	PA190404W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
BTEX, GC/MS	SW5030C/8260C	04/03/19 16:35	190403A3	VF190403W1	Yes	BLK/LCS/LCSD
Other / Misc.						
Available Cyanide	OIA-1677	04/04/19 11:25	ACN190404-W1	ACN190404-W1	No	BLK/LCS/MS/MSD/DU

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: AMN190402QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Ammonia-N (Undistilled)	SM4500-NH3 D	04/02/19 19:05	AMN190402QC

Inorganics, Prep Batch ID: OGHEX190404W01

Surrogates: No, QC Types: BLK/LCS

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Oil & Grease n-Hexane Extract.	E1664A	04/04/19 14:46	OGHEX190404W01

Inorganics, Prep Batch ID: PHS190403QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Total Phosphorus	SM4500-PE	04/03/19 13:44	PHS190403QC

Inorganics, Prep Batch ID: TSS190404

Surrogates: No, QC Types: BLK/LCS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Total Suspended Solids	SM2540D	04/04/19 23:50	TSS190404

Metals, Prep Batch ID: HGD-040819-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Mercury	E245.1	04/08/19 12:52	HG2-19-0408A

Metals, Prep Batch ID: MTD-040219-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Arsenic	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Cadmium	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Chromium	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Copper	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Lead	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Nickel	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Silver	E200.8	04/02/19 16:16	MT4-19-0402B
S00407.01	Zinc	E200.8	04/02/19 16:16	MT4-19-0402B

Organics - PCBs/Pesticides, Prep Batch ID: PA190404W01

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	PCB	E608.3	04/04/19 13:54	A190404

Organics - Volatiles, Prep Batch ID: VF190403W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	BTEX, GC/MS	SW5030C/8260C	04/03/19 16:35	190403A3

Other / Misc., Prep Batch ID: ACN190404-W1

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S00407.01	Available Cyanide	OIA-1677	04/04/19 11:25	ACN190404-W1

QC Report - Surrogates per Lab Sample

Lab Sample ID: S00407.01

Sample Tag: 02-PRCC-19

Collected Date/Time: 04/01/2019 11:45

Matrix: Wastewater

COC Reference: 121781

Organics - PCBs/Pesticides, Analysis: PCB

Run in Batch: A190404, Run Date: 04/04/2019 13:54, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		82.20	34.1	137.1
DCBP		107.80	30.0	138.6

Organics - Volatiles, Analysis: BTEX, GC/MS

Run in Batch: 190403A3, Run Date: 04/03/2019 16:35, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		94.8	80.0	124.0
1,2-Dichloroethane-D4		100.2	72.0	125.0
Toluene-D8		104.0	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - PCBs/Pesticides, Prep Batch ID: PA190404W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: a19040406.sblk-w.01

Run in Batch: A190404, Run Date: 04/04/2019 12:07, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		104.10	34.1	137.1
DCBP		107.20	30.0	138.6

Blank (BLK)

Lab Sample ID: b19040404.sblk-w.01

Run in Batch: B190404, Run Date: 04/04/2019 11:46, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		92.40	34.1	137.1
DCBP		98.20	30.0	138.6

Laboratory Control Sample (LCS)

Lab Sample ID: a19040407.slcs-w.01

Run in Batch: A190404, Run Date: 04/04/2019 12:18, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		97.20	34.1	137.1
DCBP		87.10	30.0	138.6

Laboratory Control Sample (LCS)

Lab Sample ID: b19040405.slcs-w.01

Run in Batch: B190404, Run Date: 04/04/2019 12:52, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		79.20	34.1	137.1
DCBP		89.00	30.0	138.6

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: a19040408.slcs-w.01d, Parent Sample ID: a19040407.slcs-w.01

Run in Batch: A190404, Run Date: 04/04/2019 13:27, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		87.20	34.1	137.1
DCBP		79.20	30.0	138.6

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: b19040406.slcs-w.01d, Parent Sample ID: b19040405.slcs-w.01

Run in Batch: B190404, Run Date: 04/04/2019 13:09, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
TCX		73.00	34.1	137.1
DCBP		84.30	30.0	138.6

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF190403W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 190403A3.BLKW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 14:03, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		91.6	80.0	124.0
1,2-Dichloroethane-D4		95.4	72.0	125.0
Toluene-D8		104.2	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 12:47, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.4	80.0	124.0
1,2-Dichloroethane-D4		88.6	72.0	125.0
Toluene-D8		104.0	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 190403A3.LCSDW03A, Parent Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 13:06, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		97.0	80.0	124.0
1,2-Dichloroethane-D4		92.2	72.0	125.0
Toluene-D8		104.0	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S00407.01

Sample Tag: 02-PRCC-19

Collected Date/Time: 04/01/2019 11:45

Matrix: Wastewater

COC Reference: 121781

Organics - Volatiles, Analysis: BTEX, GC/MS

Run in Batch: 190403A3, Run Date: 04/03/2019 16:35, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		90.8	50.0	200.0
1,4-Difluorobenzene		89.4	50.0	200.0
Chlorobenzene-D5		90.1	50.0	200.0
1,4-Dichlorobenzene-D4		87.2	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF190403W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 190403A3.BLKW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 14:03, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		96.5	50.0	200.0
1,4-Difluorobenzene		95.0	50.0	200.0
Chlorobenzene-D5		93.5	50.0	200.0
1,4-Dichlorobenzene-D4		87.1	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 12:47, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		103.2	50.0	200.0
1,4-Difluorobenzene		101.9	50.0	200.0
Chlorobenzene-D5		99.3	50.0	200.0
1,4-Dichlorobenzene-D4		98.3	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 190403A3.LCSDW03A, Parent Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 13:06, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		99.6	50.0	200.0
1,4-Difluorobenzene		97.7	50.0	200.0
Chlorobenzene-D5		95.5	50.0	200.0
1,4-Dichlorobenzene-D4		94.5	50.0	200.0

QC Report - Batch QC Results

Inorganics, Prep Batch ID: AMN190402QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: AMN190402QC.LRB1

Run in Batch: AMN190402QC, Run Date: 04/02/2019 10:22, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Ammonia-N (Undistilled)		ND	0.02	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: AMN190402QC.LCS1

Run in Batch: AMN190402QC, Run Date: 04/02/2019 11:31, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		99	90	110

Matrix Spike (MS)

Lab Sample ID: AMN190402QC.MS1, Parent Sample ID: S00331.04

Run in Batch: AMN190402QC, Run Date: 04/02/2019 12:46, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		97	80	120

Duplicate (DUP)

Lab Sample ID: AMN190402QC.DP1, Parent Sample ID: S00331.03

Run in Batch: AMN190402QC, Run Date: 04/02/2019 12:17, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Ammonia-N (Undistilled)		1.5	20

QC Report - Batch QC Results

Inorganics, Prep Batch ID: OGHEX190404W01

Surrogates: No, QC Types: BLK/LCS

Blank (BLK)

Lab Sample ID: OGHEX190404W01.LRB1

Run in Batch: OGHEX190404W01, Run Date: 04/04/2019 14:47, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Oil & Grease n-Hexane Extract.		ND	1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: OGHEX190404W01.LCS1

Run in Batch: OGHEX190404W01, Run Date: 04/04/2019 14:47, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Oil & Grease n-Hexane Extract.		98	78	114

Laboratory Control Sample (LCS)

Lab Sample ID: OGHEX190404W01.LCS2

Run in Batch: OGHEX190404W01, Run Date: 04/04/2019 14:47, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Oil & Grease n-Hexane Extract.		98	78	114

QC Report - Batch QC Results

Inorganics, Prep Batch ID: PHS190403QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS190403QC.LRB1

Run in Batch: PHS190403QC, Run Date: 04/03/2019 12:53, Prep Date: 04/03/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS190403QC.LRB2

Run in Batch: PHS190403QC, Run Date: 04/03/2019 13:02, Prep Date: 04/03/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS190403QC.LCS1

Run in Batch: PHS190403QC, Run Date: 04/03/2019 13:10, Prep Date: 04/03/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		95	90	110

Matrix Spike (MS)

Lab Sample ID: PHS190403QC.MS1, Parent Sample ID: S00456.01

Run in Batch: PHS190403QC, Run Date: 04/03/2019 19:50, Prep Date: 04/03/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		81	80	120

Duplicate (DUP)

Lab Sample ID: PHS190403QC.DP1, Parent Sample ID: S00339.01

Run in Batch: PHS190403QC, Run Date: 04/03/2019 19:46, Prep Date: 04/03/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.2	20

QC Report - Batch QC Results

Inorganics, Prep Batch ID: TSS190404

Surrogates: No, QC Types: BLK/LCS/DUP

Blank (BLK)

Lab Sample ID: TSS190404.LRB1

Run in Batch: TSS190404, Run Date: 04/04/2019 23:50, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Suspended Solids		ND	3	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TSS190404.LCS1

Run in Batch: TSS190404, Run Date: 04/04/2019 23:50, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
Total Suspended Solids		97.6	68.8	111

Duplicate (DUP)

Lab Sample ID: TSS190404.DP1, Parent Sample ID: S00434.02

Run in Batch: TSS190404, Run Date: 04/04/2019 23:50, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Total Suspended Solids		2.8	5

QC Report - Batch QC Results

Metals, Prep Batch ID: HGD-040819-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: HG2-19-0408A.017.LRB

Run in Batch: HG2-19-0408A, Run Date: 04/08/2019 12:40, Prep Date: 04/08/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Mercury		ND	0.03	ug/L

Laboratory Control Sample (LCS)

Lab Sample ID: HG2-19-0408A.016.LCS

Run in Batch: HG2-19-0408A, Run Date: 04/08/2019 12:38, Prep Date: 04/08/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Mercury		95	85	115

Matrix Spike (MS)

Lab Sample ID: HG2-19-0408A.028.MS, Parent Sample ID: S00506.22

Run in Batch: HG2-19-0408A, Run Date: 04/08/2019 13:01, Prep Date: 04/08/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Mercury		98	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: HG2-19-0408A.029.MSD, Parent Sample ID: HG2-19-0408A.028.MS

Run in Batch: HG2-19-0408A, Run Date: 04/08/2019 13:03, Prep Date: 04/08/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Mercury		103	75	125	5	20

QC Report - Batch QC Results

Metals, Prep Batch ID: MTD-040219-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: MT4-19-0402B.024.LRB

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 15:46, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Arsenic		ND	0.0004	mg/L
Cadmium		ND	0.0001	mg/L
Chromium		ND	0.001	mg/L
Copper		ND	0.001	mg/L
Lead		ND	0.0006	mg/L
Nickel		ND	0.001	mg/L
Silver		ND	0.0001	mg/L
Zinc		ND	0.002	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: MT4-19-0402B.022.LCS

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 15:42, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		108	85	115
Cadmium		101	85	115
Chromium		103	85	115
Copper		103	85	115
Lead		104	85	115
Nickel		100	85	115
Silver		99	85	115
Zinc		100	85	115

Matrix Spike (MS)

Lab Sample ID: MT4-19-0402B.044.MS, Parent Sample ID: S00323.01

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 16:20, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		100	75	125
Cadmium		100	75	125
Chromium		100	75	125
Copper		99	75	125
Lead		101	75	125
Nickel		97	75	125
Silver		94	75	125
Zinc		97	75	125

Matrix Spike (MS)

Lab Sample ID: MT4-19-0402B.068.MS, Parent Sample ID: S00377.02

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 16:51, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		99	75	125
Cadmium		99	75	125
Chromium		101	75	125
Copper		95	75	125
Lead		100	75	125
Nickel		98	75	125
Silver		92	75	125

QC Report - Batch QC Results

Metals, Prep Batch ID: MTD-040219-2 (continued)

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: MT4-19-0402B.068.MS, Parent Sample ID: S00377.02

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 16:51, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Zinc		99	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT4-19-0402B.045.MSD, Parent Sample ID: MT4-19-0402B.044.MS

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 16:21, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		102	75	125	2	20
Cadmium		105	75	125	5	20
Chromium		102	75	125	2	20
Copper		102	75	125	2	20
Lead		101	75	125	0	20
Nickel		104	75	125	7	20
Silver		98	75	125	3	20
Zinc		102	75	125	4	20

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT4-19-0402B.069.MSD, Parent Sample ID: MT4-19-0402B.068.MS

Run in Batch: MT4-19-0402B, Run Date: 04/02/2019 16:52, Prep Date: 04/02/2019, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		104	75	125	5	20
Cadmium		101	75	125	2	20
Chromium		100	75	125	1	20
Copper		96	75	125	1	20
Lead		100	75	125	0	20
Nickel		96	75	125	2	20
Silver		92	75	125	0	20
Zinc		97	75	125	1	20

QC Report - Batch QC Results

Organics - PCBs/Pesticides, Prep Batch ID: PA190404W01

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: a19040406.sblk-w.01

Run in Batch: A190404, Run Date: 04/04/2019 12:07, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PCB-1016		ND	0.10	ug/L
PCB-1221		ND	0.10	ug/L
PCB-1232		ND	0.10	ug/L
PCB-1242		ND	0.10	ug/L
PCB-1248		ND	0.10	ug/L
PCB-1254		ND	0.10	ug/L
PCB-1260		ND	0.10	ug/L

Laboratory Control Sample (LCS)

Lab Sample ID: a19040407.slcs-w.01

Run in Batch: A190404, Run Date: 04/04/2019 12:18, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PCB-1016/1260		98.20	50.0	125.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: a19040408.slcs-w.01d, Parent Sample ID: a19040407.slcs-w.01

Run in Batch: A190404, Run Date: 04/04/2019 13:27, Prep Date: 04/04/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PCB-1016/1260		91.12	50.0	125.0	7.5	20.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF190403W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 190403A3.BLKW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 14:03, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Benzene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 12:47, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Benzene		104.4	79.9	124.9
Toluene		103.6	79.8	124.5
Ethylbenzene		102.1	79.5	129.1
p,m-Xylene		103.4	79.4	132.2
o-Xylene		99.9	80.2	131.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 190403A3.LCSDW03A, Parent Sample ID: 190403A3.LCSW03A

Run in Batch: 190403A3, Run Date: 04/03/2019 13:06, Prep Date: 04/03/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Benzene		108.2	79.9	124.9	3.5	30.0
Toluene		107.4	79.8	124.5	3.6	30.0
Ethylbenzene		106.6	79.5	129.1	4.3	30.0
p,m-Xylene		107.9	79.4	132.2	4.3	30.0
o-Xylene		103.7	80.2	131.0	3.8	30.0

QC Report - Batch QC Results

Other / Misc., Prep Batch ID: ACN190404-W1

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: ACN190404-W1.LRB1

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:17, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Available Cyanide		ND	0.002	mg/L

Blank (BLK)

Lab Sample ID: ACN190404-W1.LRB2

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:45, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Available Cyanide		ND	0.002	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: ACN190404-W1.LCS1

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:21, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Available Cyanide		96	88	109

Matrix Spike (MS)

Lab Sample ID: ACN190404-W1.MS1, Parent Sample ID: S00407.01

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:29, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Available Cyanide		92	82	130

Matrix Spike Duplicate (MSD)

Lab Sample ID: ACN190404-W1.MSD1, Parent Sample ID: ACN190404-W1.MS1

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:31, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Available Cyanide		94	82	130	2	15

Duplicate (DUP)

Lab Sample ID: ACN190404-W1.DP1, Parent Sample ID: S00407.01

Run in Batch: ACN190404-W1, Run Date: 04/04/2019 11:27, Prep Date: 04/04/2019, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Available Cyanide		<1	15

Merit Laboratories Login Checklist

Lab Set ID:S00407

Client:OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater Rd Landfill

Submitted:04/01/2019 14:00 Login User: SRS

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:

Email: Clifford.Yantz@obg.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.3 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

Chain of Custody

- | | | |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

Preservation

- | | | |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? |

Bottle Conditions

- | | | |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time |
| 19. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S00407 Initials: SRS

Client: OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater Rd Landfill

Submitted: 04/01/2019 14:00 Login User:

Attention: Clifford Yantz
 Address: O'Brien & Gere Engineers, Inc.
 2260 E Saginaw St
 East Lansing, MI 48823

Phone: 248-477-5701 FAX:
 Email: Clifford.Yantz@obg.com

Lab ID	125 ml Plastic HNO ₃	250 ml Plastic HNO ₃	1 L Plastic HNO ₃	250 ml Plastic H ₂ SO ₄	125 ml Amber H ₂ SO ₄	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber PbCO ₃ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S00407.01	X								X					
S00407.01				X					X					
S00407.01						X			X					
S00407.01								X		X				



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 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 121781

REPORT TO **CHAIN OF CUSTODY RECORD** **INVOICE TO**

CONTACT NAME: Clifford Yantz
 COMPANY: O'Brien & Gere
 ADDRESS: 2260 E Saginaw
 CITY: East Lansing STATE: MI ZIP CODE: 48823
 PHONE NO.: 313-333-0211 FAX NO.: _____ P.O. NO.: _____
 E-MAIL ADDRESS: clifford.yantz@obg.com QUOTE NO.: _____

CONTACT NAME: X SAME
 COMPANY: _____
 ADDRESS: _____
 CITY: _____ STATE: _____ ZIP CODE: _____
 PHONE NO.: _____ E-MAIL ADDRESS: _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: RACER Coldwater Rd Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schroeder
 TURNAROUND TIME REQUIRED: 1 DAY 2 DAYS 3 DAYS STANDARD OTHER 5 day TAT
 DELIVERABLES REQUIRED: STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives		AMMONIA-Nitrogen	BOD	HEM	Total Phosphorus	TSS	Total Metals	Available Cyanide	Total PCBs	BETX	Certifications
4	4	X	X	X	X	X	X	X	X	X	<input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water <input type="checkbox"/> DoD <input type="checkbox"/> NPDES Project Locations <input type="checkbox"/> Detroit <input type="checkbox"/> New York <input type="checkbox"/> Other _____ Special Instructions <u>Metals ARE:</u> <u>As, Cr, Cu, Hg, Ni</u> <u>Zn, Cd, Pb, Ag</u> <u>Analysis per city of Flint</u> <u>Field pH 7.4</u> <u>Field Temp 8°C</u>

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
00407.01	4/1/19	1145	02-PRCC-19	ww	1	4	4	1	1			

RELINQUISHED BY: [Signature] obg Sampler DATE: 4/1/19 TIME: 1230
 RECEIVED BY: [Signature] DATE: 4/1/19 TIME: 12:30
 RELINQUISHED BY: [Signature] DATE: 4/1/19 TIME: 14:00
 RECEIVED BY: [Signature] DATE: 4/1/19 TIME: 1400

RELINQUISHED BY: _____ DATE: _____ TIME: _____
 RECEIVED BY: _____ DATE: _____ TIME: _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: TEMP ON ARRIVAL 4.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



Analytical Laboratory Report

Report ID: S01219.01(01)
Generated on 05/08/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S01219.01-S01219.04
Project: RACER Coldwater Rd Landfill
Collected Date: 04/23/2019 - 04/24/2019
Submitted Date/Time: 04/24/2019 15:45
Sampled by: Kevin Schneider
P.O. #: 11900504

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7



Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S01219.01	Field Blank-042319	Water	04/23/19 07:10
S01219.02	02-PRCC-19-Inf	Wastewater	04/23/19 07:12
S01219.03	02-PRCC-19-MID-120	Wastewater	04/24/19 07:15
S01219.04	02-PRCC-19-PRIM-120	Wastewater	04/24/19 07:18



Analytical Laboratory Report

Lab Sample ID: S01219.01

Sample Tag: Field Blank-042319

Collected Date/Time: 04/23/2019 07:10

Matrix: Water

COC Reference: 121728

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.1	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 11:27, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.02	375-22-4	
PFPeA*	Not detected	10		ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.02	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.02	307-24-4	
PFBS*	Not detected	10		ng/L	2.02	375-73-5	
PFHpA*	Not detected	10		ng/L	2.02	375-85-9	
PFPeS*	Not detected	10		ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.02	27619-97-2	
PFOA*	Not detected	10		ng/L	2.02	335-67-1	
PFHxS*	Not detected	10		ng/L	2.02	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.02	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.02	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.02	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.02	375-92-8	
PFDA*	Not detected	10		ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.02	2991-50-6	
PFOS*	Not detected	10		ng/L	2.02	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.02	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.02	2058-94-8	
PFNS*	Not detected	10		ng/L	2.02	474511-07-4	
PFDODA*	Not detected	10		ng/L	2.02	307-55-1	
PFDS*	Not detected	10		ng/L	2.02	335-77-3	
PFTTrDA*	Not detected	10		ng/L	2.02	72629-94-8	
FOSA*	Not detected	10		ng/L	2.02	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.02	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01219.02

Sample Tag: 02-PRCC-19-Inf

Collected Date/Time: 04/23/2019 07:12

Matrix: Wastewater

COC Reference: 121728

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.1	IR

Organics

24 PFAs, Method: ASTMD7979-17M, Run Date: 05/03/19 11:46, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	29		ng/L	2	375-22-4	X
PFPeA*	Not detected	11		ng/L	2	2706-90-3	X
4:2 FTSA*	Not detected	10		ng/L	2	757124-72-4	
PFHxA*	Not detected	10		ng/L	2	307-24-4	
PFBS*	Not detected	10		ng/L	2	375-73-5	
PFHpA*	Not detected	10		ng/L	2	375-85-9	
PFPeS*	16	10		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2	27619-97-2	
PFOA*	Not detected	10		ng/L	2	335-67-1	
PFHxS*	53	10		ng/L	2	355-46-4	
PFHxS-LN*	45	10		ng/L	2	355-46-4-LN	
PFHxS-BR*	11	10		ng/L	2	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2	39108-34-4	
PFHpS*	18	10		ng/L	2	375-92-8	
PFDA*	Not detected	10		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2	2991-50-6	
PFOS*	1,300	10		ng/L	2	1763-23-1	
PFOS-LN*	820	10		ng/L	2	1763-23-1-LN	
PFOS-BR*	500	10		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2	2058-94-8	
PFNS*	Not detected	10		ng/L	2	474511-07-4	
PFDoDA*	Not detected	10		ng/L	2	307-55-1	
PFDS*	Not detected	10		ng/L	2	335-77-3	
PFTTrDA*	Not detected	10		ng/L	2	72629-94-8	
FOSA*	Not detected	10		ng/L	2	754-91-6	
PFTeDA*	Not detected	10		ng/L	2	376-06-7	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S01219.03

Sample Tag: 02-PRCC-19-MID-120

Collected Date/Time: 04/24/2019 07:15

Matrix: Wastewater

COC Reference: 121728

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.1	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 12:06, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.91	375-22-4	
PFPeA*	Not detected	9.6		ng/L	1.91	2706-90-3	
4:2 FTSA*	Not detected	9.6		ng/L	1.91	757124-72-4	
PFHxA*	Not detected	9.6		ng/L	1.91	307-24-4	
PFBS*	Not detected	9.6		ng/L	1.91	375-73-5	
PFHpA*	Not detected	9.6		ng/L	1.91	375-85-9	
PFPeS*	Not detected	9.6		ng/L	1.91	2706-91-4	
6:2 FTSA*	Not detected	9.6		ng/L	1.91	27619-97-2	
PFOA*	Not detected	9.6		ng/L	1.91	335-67-1	
PFHxS*	Not detected	9.6		ng/L	1.91	355-46-4	
PFHxS-LN*	Not detected	9.6		ng/L	1.91	355-46-4-LN	
PFHxS-BR*	Not detected	9.6		ng/L	1.91	355-46-4-BR	
PFNA*	Not detected	9.6		ng/L	1.91	375-95-1	
8:2 FTSA*	Not detected	9.6		ng/L	1.91	39108-34-4	
PFHpS*	Not detected	9.6		ng/L	1.91	375-92-8	
PFDA*	Not detected	9.6		ng/L	1.91	335-76-2	
N-MeFOSAA*	Not detected	9.6		ng/L	1.91	2355-31-9	
EtFOSAA*	Not detected	9.6		ng/L	1.91	2991-50-6	
PFOS*	20	9.6		ng/L	1.91	1763-23-1	
PFOS-LN*	Not detected	9.6		ng/L	1.91	1763-23-1-LN	
PFOS-BR*	13	9.6		ng/L	1.91	1763-23-1-BR	
PFUnDA*	Not detected	9.6		ng/L	1.91	2058-94-8	
PFNS*	Not detected	9.6		ng/L	1.91	474511-07-4	
PFDODA*	Not detected	9.6		ng/L	1.91	307-55-1	
PFDS*	Not detected	9.6		ng/L	1.91	335-77-3	
PFTTrDA*	Not detected	9.6		ng/L	1.91	72629-94-8	
FOSA*	Not detected	9.6		ng/L	1.91	754-91-6	
PFTeDA*	Not detected	9.6		ng/L	1.91	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01219.04

Sample Tag: 02-PRCC-19-PRIM-120

Collected Date/Time: 04/24/2019 07:18

Matrix: Wastewater

COC Reference: 121728

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.1	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 12:25, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.99	375-22-4	
PFPeA*	Not detected	10.0		ng/L	1.99	2706-90-3	
4:2 FTSA*	Not detected	10.0		ng/L	1.99	757124-72-4	
PFHxA*	Not detected	10.0		ng/L	1.99	307-24-4	
PFBS*	Not detected	10.0		ng/L	1.99	375-73-5	
PFHpA*	Not detected	10.0		ng/L	1.99	375-85-9	
PFPeS*	Not detected	10.0		ng/L	1.99	2706-91-4	
6:2 FTSA*	Not detected	10.0		ng/L	1.99	27619-97-2	
PFOA*	Not detected	10.0		ng/L	1.99	335-67-1	
PFHxS*	Not detected	10.0		ng/L	1.99	355-46-4	
PFHxS-LN*	Not detected	10.0		ng/L	1.99	355-46-4-LN	
PFHxS-BR*	Not detected	10.0		ng/L	1.99	355-46-4-BR	
PFNA*	Not detected	10.0		ng/L	1.99	375-95-1	
8:2 FTSA*	Not detected	10.0		ng/L	1.99	39108-34-4	
PFHpS*	Not detected	10.0		ng/L	1.99	375-92-8	
PFDA*	Not detected	10.0		ng/L	1.99	335-76-2	
N-MeFOSAA*	Not detected	10.0		ng/L	1.99	2355-31-9	
EtFOSAA*	Not detected	10.0		ng/L	1.99	2991-50-6	
PFOS*	110	10.0		ng/L	1.99	1763-23-1	
PFOS-LN*	54	10.0		ng/L	1.99	1763-23-1-LN	
PFOS-BR*	56	10.0		ng/L	1.99	1763-23-1-BR	
PFUnDA*	Not detected	10.0		ng/L	1.99	2058-94-8	
PFNS*	Not detected	10.0		ng/L	1.99	474511-07-4	
PFDODA*	Not detected	10.0		ng/L	1.99	307-55-1	
PFDS*	Not detected	10.0		ng/L	1.99	335-77-3	
PFTTrDA*	Not detected	10.0		ng/L	1.99	72629-94-8	
FOSA*	Not detected	10.0		ng/L	1.99	754-91-6	
PFTeDA*	Not detected	10.0		ng/L	1.99	376-06-7	

Merit Laboratories Login Checklist

Lab Set ID:S01219

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Client:OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)

Project: RACER Coldwater Rd Landfill

Submitted:04/24/2019 15:45 Login User: MMC

Phone: 313-333-0211 FAX:

Email: Clifford.Yantz@obg.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 3.1 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

Chain of Custody

- | | | |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

Preservation

- | | | |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? |

Bottle Conditions

- | | | |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____



2680 East Lansing Dr., East Lansing, MI 48823
 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

121728

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY O'Brien & Gere
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS clifford.yantz@obg.com QUOTE NO. _____

CONTACT NAME X SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RACER Coldwater Rd Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE
 # Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PFAS (7979)
	DATE	TIME											
01219.01	4/23/19	710	Field Blank - 042319	QC	1	1							X
.02	4/23/19	712	02-PRCC-19-Inf	ww	3	3							X
.03	4/24/19	715	02-PRCC-19-MID-120	ww	3	3							X
.04	4/24/19	718	02-PRCC-19-Prim-120	ww	3	3							X
1035													

RELINQUISHED BY: [Signature] OSB Sampler DATE 4/24/19 TIME 1215
 RECEIVED BY: [Signature] DATE 4/24/19 TIME 12:15
 RELINQUISHED BY: [Signature] DATE 4/24/19 TIME 12:45
 RECEIVED BY: [Signature] DATE 4/24/19 TIME 1315

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: TEMP. ON ARRIVAL 3.1



Quality Control Report

Report ID: QC-S01219-01
Generated on 05/20/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S01219.01-S01219.04
Project: RACER Coldwater Rd Landfill
Submitted Date/Time: 04/24/2019 15:45
Sampled by: Kevin Schneider
P.O. #: 11900504

QC Report Sections

- Cover Page (Page 1)
- Analysis Summary (Pages 2-5)
- Prep Batch Summary (Page 6)
- Internal Standards per Lab Sample (Pages 7-10)
- Internal Standards per QC Sample (Pages 11-13)
- Batch QC Results (Pages 14-17)

Report Flag Descriptions

- *: QC result is outside of indicated control limits
- W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S01219.01

Sample Tag: Field Blank-042319

Collected Date/Time: 04/23/2019 07:10

Matrix: Water

COC Reference: 121728

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 11:27	DQ190502B	PF190502W2	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01219.02

Sample Tag: 02-PRCC-19-Inf

Collected Date/Time: 04/23/2019 07:12

Matrix: Wastewater

COC Reference: 121728

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 11:46	DQ190502B	PF190502W2	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01219.03

Sample Tag: 02-PRCC-19-MID-120

Collected Date/Time: 04/24/2019 07:15

Matrix: Wastewater

COC Reference: 121728

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 12:06	DQ190502B	PF190502W2	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01219.04

Sample Tag: 02-PRCC-19-PRIM-120

Collected Date/Time: 04/24/2019 07:18

Matrix: Wastewater

COC Reference: 121728

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 12:25	DQ190502B	PF190502W2	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: PF190502W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S01219.01	24 PFAs	ASTMD7979-17M	05/03/19 11:27	DQ190502B
S01219.02	24 PFAs	ASTMD7979-17M	05/03/19 11:46	DQ190502B
S01219.03	24 PFAs	ASTMD7979-17M	05/03/19 12:06	DQ190502B
S01219.04	24 PFAs	ASTMD7979-17M	05/03/19 12:25	DQ190502B

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01219.01

Sample Tag: Field Blank-042319

Collected Date/Time: 04/23/2019 07:10

Matrix: Water

COC Reference: 121728

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502B, Run Date: 05/03/2019 11:27, Matrix: WW, Dilution: 2.02

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		93.6	50.0	150.0
M2-6:2FTSA		84.7	50.0	150.0
M2-8:2FTSA		85.9	50.0	150.0
M2PFTeDA		114.0	12.0	218.0
M3PFBS		99.8	50.0	150.0
M3PFHxS		105.1	50.0	150.0
M4PFHpA		103.9	50.0	150.0
M5PFHxA		104.0	50.0	150.0
M5PFPeA		105.0	50.0	150.0
M6PFDA		100.6	50.0	150.0
M7PFUnDA		101.0	50.0	150.0
M8FOSA		117.9	50.0	150.0
M8PFOA		107.1	50.0	150.0
M8PFOS		101.4	50.0	150.0
M9-PFNA		107.1	50.0	150.0
MPFBA		100.5	50.0	150.0
MPFDoDA		98.1	50.0	150.0
d3N-MeFOSAA		103.5	50.0	150.0
d5EtFOSAA		95.6	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01219.02

Sample Tag: 02-PRCC-19-Inf

Collected Date/Time: 04/23/2019 07:12

Matrix: Wastewater

COC Reference: 121728

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502B, Run Date: 05/03/2019 11:46, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		82.1	50.0	150.0
M2-6:2FTSA		83.1	50.0	150.0
M2-8:2FTSA		67.5	50.0	150.0
M2PFTeDA		113.7	12.0	218.0
M3PFBS		111.2	50.0	150.0
M3PFHxS		103.7	50.0	150.0
M4PFHpA		104.9	50.0	150.0
M5PFHxA		108.6	50.0	150.0
M5PFPeA		108.4	50.0	150.0
M6PFDA		98.8	50.0	150.0
M7PFUnDA		102.6	50.0	150.0
M8FOSA		118.0	50.0	150.0
M8PFOA		106.6	50.0	150.0
M8PFOS		94.2	50.0	150.0
M9-PFNA		99.6	50.0	150.0
MPFBA		99.4	50.0	150.0
MPFDoDA		104.4	50.0	150.0
d3N-MeFOSAA		97.2	50.0	150.0
d5EtFOSAA		96.2	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01219.03

Sample Tag: 02-PRCC-19-MID-120

Collected Date/Time: 04/24/2019 07:15

Matrix: Wastewater

COC Reference: 121728

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502B, Run Date: 05/03/2019 12:06, Matrix: WW, Dilution: 1.91

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		72.6	50.0	150.0
M2-6:2FTSA		85.4	50.0	150.0
M2-8:2FTSA		72.1	50.0	150.0
M2PFTeDA		88.9	12.0	218.0
M3PFBS		106.9	50.0	150.0
M3PFHxS		106.0	50.0	150.0
M4PFHpA		106.1	50.0	150.0
M5PFHxA		108.7	50.0	150.0
M5PFPeA		108.4	50.0	150.0
M6PFDA		104.9	50.0	150.0
M7PFUnDA		89.4	50.0	150.0
M8FOSA		118.1	50.0	150.0
M8PFOA		103.5	50.0	150.0
M8PFOS		100.6	50.0	150.0
M9-PFNA		103.5	50.0	150.0
MPFBA		100.4	50.0	150.0
MPFDoDA		97.5	50.0	150.0
d3N-MeFOSAA		99.7	50.0	150.0
d5EtFOSAA		89.4	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01219.04

Sample Tag: 02-PRCC-19-PRIM-120

Collected Date/Time: 04/24/2019 07:18

Matrix: Wastewater

COC Reference: 121728

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502B, Run Date: 05/03/2019 12:25, Matrix: WW, Dilution: 1.99

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		81.0	50.0	150.0
M2-6:2FTSA		92.3	50.0	150.0
M2-8:2FTSA		79.4	50.0	150.0
M2PFTeDA		133.2	12.0	218.0
M3PFBS		114.7	50.0	150.0
M3PFHxS		109.0	50.0	150.0
M4PFHpA		110.8	50.0	150.0
M5PFHxA		108.6	50.0	150.0
M5PFPeA		111.5	50.0	150.0
M6PFDA		110.5	50.0	150.0
M7PFUnDA		99.8	50.0	150.0
M8FOSA		116.4	50.0	150.0
M8PFOA		106.9	50.0	150.0
M8PFOS		105.4	50.0	150.0
M9-PFNA		115.2	50.0	150.0
MPFBA		102.5	50.0	150.0
MPFDoDA		111.1	50.0	150.0
d3N-MeFOSAA		94.6	50.0	150.0
d5EtFOSAA		114.1	50.0	150.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: PF190502W2

QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502B.BLK190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 11:07, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		86.2	50.0	150.0
M2-6:2FTSA		79.7	50.0	150.0
M2-8:2FTSA		78.4	50.0	150.0
M2PFTeDA		104.2	12.0	218.0
M3PFBS		104.3	50.0	150.0
M3PFHxS		111.1	50.0	150.0
M4PFHpA		106.9	50.0	150.0
M5PFHxA		108.0	50.0	150.0
M5PFPeA		110.1	50.0	150.0
M6PFDA		110.3	50.0	150.0
M7PFUnDA		105.3	50.0	150.0
M8FOSA		123.7	50.0	150.0
M8PFOA		107.7	50.0	150.0
M8PFOS		94.4	50.0	150.0
M9-PFNA		105.7	50.0	150.0
MPFBA		101.5	50.0	150.0
MPFDoDA		104.9	50.0	150.0
d3N-MeFOSAA		99.2	50.0	150.0
d5EtFOSAA		105.2	50.0	150.0

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502B.LCS190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 10:28, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		88.7	50.0	150.0
M2-6:2FTSA		89.5	50.0	150.0
M2-8:2FTSA		86.4	50.0	150.0
M2PFTeDA		104.1	12.0	218.0
M3PFBS		114.5	50.0	150.0
M3PFHxS		100.4	50.0	150.0
M4PFHpA		111.9	50.0	150.0
M5PFHxA		112.0	50.0	150.0
M5PFPeA		110.3	50.0	150.0
M6PFDA		105.6	50.0	150.0
M7PFUnDA		100.0	50.0	150.0
M8FOSA		118.4	50.0	150.0
M8PFOA		107.2	50.0	150.0
M8PFOS		111.1	50.0	150.0
M9-PFNA		108.5	50.0	150.0
MPFBA		103.1	50.0	150.0
MPFDoDA		101.0	50.0	150.0
d3N-MeFOSAA		93.9	50.0	150.0
d5EtFOSAA		92.5	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502B.LCSD190502B, Parent Sample ID: DQ190502B.LCS190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 10:48, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		94.1	50.0	150.0
M2-6:2FTSA		86.5	50.0	150.0
M2-8:2FTSA		71.6	50.0	150.0
M2PFTeDA		114.3	12.0	218.0
M3PFBS		105.1	50.0	150.0
M3PFHxS		111.5	50.0	150.0
M4PFHpA		107.9	50.0	150.0
M5PFHxA		105.7	50.0	150.0
M5PFPeA		110.4	50.0	150.0
M6PFDA		107.3	50.0	150.0
M7PFUnDA		106.2	50.0	150.0
M8FOSA		110.4	50.0	150.0
M8PFOA		101.4	50.0	150.0
M8PFOS		113.5	50.0	150.0
M9-PFNA		109.2	50.0	150.0
MPFBA		103.2	50.0	150.0
MPFDoDA		105.1	50.0	150.0
d3N-MeFOSAA		97.0	50.0	150.0
d5EtFOSAA		97.4	50.0	150.0

Matrix Spike (MS)

Lab Sample ID: DQ190502B.0124809M, Parent Sample ID: S01248.09

Run in Batch: DQ190502B, Run Date: 05/03/2019 16:02, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.95

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		93.4	50.0	150.0
M2-6:2FTSA		96.8	50.0	150.0
M2-8:2FTSA		84.4	50.0	150.0
M2PFTeDA		106.8	12.0	218.0
M3PFBS		114.8	50.0	150.0
M3PFHxS		101.1	50.0	150.0
M4PFHpA		118.1	50.0	150.0
M5PFHxA		114.2	50.0	150.0
M5PFPeA		114.4	50.0	150.0
M6PFDA		119.0	50.0	150.0
M7PFUnDA		107.1	50.0	150.0
M8FOSA		133.1	50.0	150.0
M8PFOA		120.2	50.0	150.0
M8PFOS		113.1	50.0	150.0
M9-PFNA		115.4	50.0	150.0
MPFBA		112.0	50.0	150.0
MPFDoDA		112.7	50.0	150.0
d3N-MeFOSAA		107.1	50.0	150.0
d5EtFOSAA		108.0	50.0	150.0

QC Report - Internal Standards per QC Sample

Duplicate (DUP)

Lab Sample ID: DQ190502B.0124804D, Parent Sample ID: S01248.04

Run in Batch: DQ190502B, Run Date: 05/03/2019 14:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA	*	270.5	50.0	150.0
M2-6:2FTSA	*	264.2	50.0	150.0
M2-8:2FTSA	*	161.1	50.0	150.0
M2PFTeDA		161.9	12.0	218.0
M3PFBS		129.8	50.0	150.0
M3PFHxS		115.5	50.0	150.0
M4PFHpA		135.0	50.0	150.0
M5PFHxA		133.1	50.0	150.0
M5PFPeA		133.4	50.0	150.0
M6PFDA		134.3	50.0	150.0
M7PFUnDA	*	150.8	50.0	150.0
M8FOSA		147.4	50.0	150.0
M8PFOA		139.8	50.0	150.0
M8PFOS		112.1	50.0	150.0
M9-PFNA		143.7	50.0	150.0
MPFBA		113.5	50.0	150.0
MPFDoDA		145.4	50.0	150.0
d3N-MeFOSAA		100.9	50.0	150.0
d5EtFOSAA		79.7	50.0	150.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502B.BLK190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 11:07, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20.0	ng/l
PFPeA		ND	10.0	ng/l
4:2 FTSA		ND	10.0	ng/l
PFHxA		ND	10.0	ng/l
PFBS		ND	10.0	ng/l
PFHpA		ND	10.0	ng/l
PFPeS		ND	10.0	ng/l
6:2 FTSA		ND	10.0	ng/l
PFOA		ND	10.0	ng/l
PFHxS-BR		ND	10.0	ng/l
PFHxS		ND	10.0	ng/l
PFHxS-LN		ND	10.0	ng/l
PFNA		ND	10.0	ng/l
8:2 FTSA		ND	10.0	ng/l
PFHpS		ND	10.0	ng/l
N-MeFOSAA		ND	10.0	ng/l
PFDA		ND	10.0	ng/l
PFOS-BR		ND	10.0	ng/l
PFOS		ND	10.0	ng/l
EtFOSAA		ND	10.0	ng/l
PFOS-LN		ND	10.0	ng/l
PFUnDA		ND	10.0	ng/l
PFNS		ND	10.0	ng/l
PFDoDA		ND	10.0	ng/l
PFDS		ND	10.0	ng/l
PFTTrDA		ND	10.0	ng/l
FOSA		ND	10.0	ng/l
PFTeDA		ND	10.0	ng/l

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502B.LCS190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 10:28, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		85.6	70.0	130.0
PFPeA		86.0	70.0	130.0
4:2 FTSA		91.9	70.0	130.0
PFHxA		86.8	70.0	130.0
PFBS		80.4	70.0	130.0
PFHpA		81.2	70.0	130.0
PFPeS		82.1	70.0	130.0
6:2 FTSA		89.8	70.0	130.0
PFOA		86.7	70.0	130.0
PFHxS		86.9	70.0	130.0
PFNA		80.8	70.0	130.0
8:2 FTSA		92.3	70.0	130.0
PFHpS		93.2	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: DQ190502B.LCS190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 10:28, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
N-MeFOSAA		90.7	70.0	130.0
PFDA		83.1	70.0	130.0
PFOS		84.5	70.0	130.0
EtFOSAA		92.4	70.0	130.0
PFUnDA		86.9	70.0	130.0
PFNS		89.3	70.0	130.0
PFDoDA		90.2	70.0	130.0
PFDS		85.7	70.0	130.0
PFTTrDA		105.0	70.0	130.0
FOSA		89.8	70.0	130.0
PFTeDA		90.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502B.LCSD190502B, Parent Sample ID: DQ190502B.LCS190502B

Run in Batch: DQ190502B, Run Date: 05/03/2019 10:48, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		86.3	70.0	130.0	0.8	30.0
PFPeA		88.5	70.0	130.0	2.9	30.0
4:2 FTSA		82.6	70.0	130.0	10.7	30.0
PFHxA		90.8	70.0	130.0	4.5	30.0
PFBS		88.6	70.0	130.0	9.7	30.0
PFHpA		86.8	70.0	130.0	6.7	30.0
PFPeS		87.5	70.0	130.0	6.4	30.0
6:2 FTSA		82.8	70.0	130.0	8.1	30.0
PFOA		89.6	70.0	130.0	3.3	30.0
PFHxS		76.8	70.0	130.0	12.3	30.0
PFNA		78.2	70.0	130.0	3.3	30.0
8:2 FTSA		99.2	70.0	130.0	7.2	30.0
PFHpS		79.2	70.0	130.0	16.2	30.0
N-MeFOSAA		88.3	70.0	130.0	2.7	30.0
PFDA		89.1	70.0	130.0	7.0	30.0
PFOS		74.9	70.0	130.0	12.0	30.0
EtFOSAA		83.5	70.0	130.0	10.1	30.0
PFUnDA		91.9	70.0	130.0	5.6	30.0
PFNS		83.6	70.0	130.0	6.6	30.0
PFDoDA		90.0	70.0	130.0	0.2	30.0
PFDS		81.3	70.0	130.0	5.3	30.0
PFTTrDA		98.5	70.0	130.0	6.4	30.0
FOSA		100.0	70.0	130.0	10.7	30.0
PFTeDA		85.9	70.0	130.0	4.9	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Matrix Spike (MS)

Lab Sample ID: DQ190502B.0124809M, Parent Sample ID: S01248.09

Run in Batch: DQ190502B, Run Date: 05/03/2019 16:02, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.95

Analyte	Flags	% Rec	LCL	UCL
PFBA		88.2	70.0	130.0
PFPeA		85.1	70.0	130.0
4:2 FTSA		83.1	70.0	130.0
PFHxA		85.1	70.0	130.0
PFBS		82.1	70.0	130.0
PFHpA		86.2	70.0	130.0
PFPeS		80.0	70.0	130.0
6:2 FTSA		92.3	70.0	130.0
PFOA		82.1	70.0	130.0
PFHxS		90.3	70.0	130.0
PFNA		82.1	70.0	130.0
8:2 FTSA		92.3	70.0	130.0
PFHpS		96.4	70.0	130.0
PFDA		76.9	70.0	130.0
N-MeFOSAA		75.9	70.0	130.0
EtFOSAA		76.9	70.0	130.0
PFOS		84.1	70.0	130.0
PFUnDA		85.1	70.0	130.0
PFNS		79.0	70.0	130.0
PFDoDA		79.0	70.0	130.0
PFDS		84.1	70.0	130.0
PFTTrDA		90.3	70.0	130.0
FOSA		86.2	70.0	130.0
PFTeDA		88.2	70.0	130.0

Duplicate (DUP)

Lab Sample ID: DQ190502B.0124804D, Parent Sample ID: S01248.04

Run in Batch: DQ190502B, Run Date: 05/03/2019 14:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
PFBA		15.4	30.0
PFPeA		NC	30.0
4:2 FTSA		NC	30.0
PFHxA		3.1	30.0
PFBS	*	200.0	30.0
PFHpA		NC	30.0
PFPeS		NC	30.0
6:2 FTSA		3.3	30.0
PFOA		9.5	30.0
PFHxS		NC	30.0
PFHxS-LN		NC	30.0
PFHxS-BR		NC	30.0
PFNA		NC	30.0
8:2 FTSA	*	200.0	30.0
PFHpS		NC	30.0
PFDA		NC	30.0
N-MeFOSAA		NC	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Duplicate (DUP) (continued)

Lab Sample ID: DQ190502B.0124804D, Parent Sample ID: S01248.04

Run in Batch: DQ190502B, Run Date: 05/03/2019 14:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
EtFOSAA		NC	30.0
PFOS		0.0	30.0
PFOS-LN		NC	30.0
PFOS-BR		26.1	30.0
PFUnDA		NC	30.0
PFNS		NC	30.0
PFDoDA		NC	30.0
PFDS		NC	30.0
PFTTrDA		NC	30.0
FOSA		NC	30.0
PFTeDA		NC	30.0



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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

121728

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME: Clifford Yantz
 COMPANY: O'Brien & Gere
 ADDRESS: 2260 East Saginaw
 CITY: East Lansing STATE: MI ZIP CODE: 48823
 PHONE NO.: 313-333-0211 FAX NO.: _____ P.O. NO.: _____
 E-MAIL ADDRESS: clifford.yantz@obg.com QUOTE NO.: _____

CONTACT NAME: X SAME
 COMPANY: _____
 ADDRESS: _____
 CITY: _____ STATE: _____ ZIP CODE: _____
 PHONE NO.: _____ E-MAIL ADDRESS: _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: RACER Coldwater Rd Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider
 TURNAROUND TIME REQUIRED: 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED: STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE
 # Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PFAS (7979)
	DATE	TIME											
01219.01	4/23/19	710	Field Blank - 042319	QC	1	1							X
.02	4/23/19	712	02-PRCC-19-Inf	ww	3	3							X
.03	4/24/19	715	02-PRCC-19-MID-120	ww	3	3							X
.04	4/24/19	718	02-PRCC-19-Prim-120	ww	3	3							X
1035													

RELINQUISHED BY: [Signature] OSB Sampler DATE: 4/24/19 TIME: 1215
 RECEIVED BY: [Signature] DATE: 4/24/19 TIME: 12:15
 RELINQUISHED BY: [Signature] DATE: 4/24/19 TIME: 12:45
 RECEIVED BY: [Signature] DATE: 4/24/19 TIME: 13:15

RELINQUISHED BY: _____ DATE: _____ TIME: _____
 RECEIVED BY: _____ DATE: _____ TIME: _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: TEMP. ON ARRIVAL 3.1



Analytical Laboratory Report

Report ID: S01268.01(01)
Generated on 05/09/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

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John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S01268.01-S01268.02
Project: RACER Coldwater Rd
Collected Date: 04/25/2019
Submitted Date/Time: 04/25/2019 16:00
Sampled by: Kevin Schneider
P.O. #: 11900504

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7



Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S01268.01	02-PRCC-19-MID-237	Wastewater	04/25/19 07:10
S01268.02	02-PRCC-19-PRIM-237	Wastewater	04/25/19 07:12



Analytical Laboratory Report

Lab Sample ID: S01268.01

Sample Tag: 02-PRCC-19-MID-237

Collected Date/Time: 04/25/2019 07:10

Matrix: Wastewater

COC Reference: 121729

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.2	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 04:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.98	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	
PFHxA*	Not detected	9.9		ng/L	1.98	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.98	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.98	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.98	335-67-1	
PFHxS*	Not detected	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	
PFOS*	Not detected	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	Not detected	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	Not detected	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	474511-07-4	
PFDODA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTTrDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01268.02

Sample Tag: 02-PRCC-19-PRIM-237

Collected Date/Time: 04/25/2019 07:12

Matrix: Wastewater

COC Reference: 121729

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.2	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 04:56, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.97	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.97	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.97	757124-72-4	
PFHxA*	Not detected	9.9		ng/L	1.97	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.97	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.97	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.97	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.97	335-67-1	
PFHxS*	12	9.9		ng/L	1.97	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.97	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.97	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.97	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.97	2991-50-6	
PFOS*	130	9.9		ng/L	1.97	1763-23-1	
PFOS-LN*	67	9.9		ng/L	1.97	1763-23-1-LN	
PFOS-BR*	64	9.9		ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.97	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.97	474511-07-4	
PFDODA*	Not detected	9.9		ng/L	1.97	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.97	335-77-3	
PFTTrDA*	Not detected	9.9		ng/L	1.97	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.97	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.97	376-06-7	

Merit Laboratories Login Checklist

Lab Set ID:S01268

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Client:OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)

Project: RACER Coldwater Rd

Submitted:04/25/2019 16:00 Login User: MMC

Phone: 313-333-0211 FAX:

Email: Clifford.Yantz@obg.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.2 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

Chain of Custody

- | | | |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

Preservation

- | | | |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? |

Bottle Conditions

- | | | |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____



2680 East Lansing Dr., East Lansing, MI 48823
 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

121729

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY O'Brien & Gere
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-337-0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS clifford.yantz@obg.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RACER Coldwater Rd SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider KSK
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

- Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PFAS (7977)
	DATE	TIME											
01268.01	4/25/19	710	02-PRCC-19-MID-237	ww	3	3							X
.02	4/25/19	712	02-PRCC-19-PRIM-237	ww	3	3							X

Field Blank-042519
 in same cooler
 see col 117146

RELINQUISHED BY: [Signature] Sampler 4/25/19 DATE 12:38 TIME
 RECEIVED BY: [Signature] DATE 4/25/19 TIME 12:38
 RELINQUISHED BY: [Signature] DATE 4/25/19 TIME 10:00
 RECEIVED BY: [Signature] DATE 4/25/19 TIME 10:00

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____ NOTES: TEMP. ON ARRIVAL 4.2
 SEAL NO. SEAL INTACT YES NO INITIALS _____



Quality Control Report

Report ID: QC-S01268-01
Generated on 05/10/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S01268.01-S01268.02
Project: RACER Coldwater Rd
Submitted Date/Time: 04/25/2019 16:00
Sampled by: Kevin Schneider
P.O. #: 11900504

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-3)
Prep Batch Summary (Page 4)
Internal Standards per Lab Sample (Pages 5-6)
Internal Standards per QC Sample (Pages 7-9)
Batch QC Results (Pages 10-13)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S01268.01

Sample Tag: 02-PRCC-19-MID-237

Collected Date/Time: 04/25/2019 07:10

Matrix: Wastewater

COC Reference: 121729

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 04:36	DQ190502	PF190502W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01268.02

Sample Tag: 02-PRCC-19-PRIM-237

Collected Date/Time: 04/25/2019 07:12

Matrix: Wastewater

COC Reference: 121729

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 04:56	DQ190502	PF190502W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: PF190502W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S01268.01	24 PFAs	ASTMD7979-17M	05/03/19 04:36	DQ190502
S01268.02	24 PFAs	ASTMD7979-17M	05/03/19 04:56	DQ190502

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01268.01

Sample Tag: 02-PRCC-19-MID-237

Collected Date/Time: 04/25/2019 07:10

Matrix: Wastewater

COC Reference: 121729

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502, Run Date: 05/03/2019 04:36, Matrix: WW, Dilution: 1.98

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		77.7	50.0	150.0
M2-6:2FTSA		83.2	50.0	150.0
M2-8:2FTSA		75.3	50.0	150.0
M2PFTeDA		82.8	12.0	218.0
M3PFBS		93.2	50.0	150.0
M3PFHxS		92.0	50.0	150.0
M4PFHpA		96.3	50.0	150.0
M5PFHxA		100.0	50.0	150.0
M5PFPeA		102.1	50.0	150.0
M6PFDA		95.4	50.0	150.0
M7PFUnDA		93.7	50.0	150.0
M8FOSA		102.4	50.0	150.0
M8PFOA		99.2	50.0	150.0
M8PFOS		84.8	50.0	150.0
M9-PFNA		95.0	50.0	150.0
MPFBA		94.7	50.0	150.0
MPFDoDA		81.7	50.0	150.0
d3N-MeFOSAA		90.6	50.0	150.0
d5EtFOSAA		82.8	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01268.02

Sample Tag: 02-PRCC-19-PRIM-237

Collected Date/Time: 04/25/2019 07:12

Matrix: Wastewater

COC Reference: 121729

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502, Run Date: 05/03/2019 04:56, Matrix: WW, Dilution: 1.97

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		77.6	50.0	150.0
M2-6:2FTSA		87.7	50.0	150.0
M2-8:2FTSA		63.6	50.0	150.0
M2PFTeDA		122.3	12.0	218.0
M3PFBS		106.9	50.0	150.0
M3PFHxS		100.4	50.0	150.0
M4PFHpA		105.1	50.0	150.0
M5PFHxA		104.1	50.0	150.0
M5PFPeA		106.8	50.0	150.0
M6PFDA		109.5	50.0	150.0
M7PFUnDA		102.9	50.0	150.0
M8FOSA		127.4	50.0	150.0
M8PFOA		106.1	50.0	150.0
M8PFOS		96.6	50.0	150.0
M9-PFNA		102.9	50.0	150.0
MPFBA		98.8	50.0	150.0
MPFDoDA		106.3	50.0	150.0
d3N-MeFOSAA		96.5	50.0	150.0
d5EtFOSAA		91.3	50.0	150.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: PF190502W1

QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502.BLK190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:42, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		76.7	50.0	150.0
M2-6:2FTSA		86.4	50.0	150.0
M2-8:2FTSA		75.1	50.0	150.0
M2PFTeDA		102.2	12.0	218.0
M3PFBS		99.5	50.0	150.0
M3PFHxS		91.8	50.0	150.0
M4PFHpA		96.8	50.0	150.0
M5PFHxA		101.3	50.0	150.0
M5PFPeA		98.7	50.0	150.0
M6PFDA		92.1	50.0	150.0
M7PFUnDA		96.9	50.0	150.0
M8FOSA		111.1	50.0	150.0
M8PFOA		96.5	50.0	150.0
M8PFOS		85.7	50.0	150.0
M9-PFNA		94.1	50.0	150.0
MPFBA		93.4	50.0	150.0
MPFDoDA		88.4	50.0	150.0
d3N-MeFOSAA		90.6	50.0	150.0
d5EtFOSAA		87.2	50.0	150.0

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		78.5	50.0	150.0
M2-6:2FTSA		78.8	50.0	150.0
M2-8:2FTSA		74.2	50.0	150.0
M2PFTeDA		121.4	12.0	218.0
M3PFBS		101.1	50.0	150.0
M3PFHxS		96.4	50.0	150.0
M4PFHpA		95.2	50.0	150.0
M5PFHxA		95.4	50.0	150.0
M5PFPeA		95.0	50.0	150.0
M6PFDA		89.6	50.0	150.0
M7PFUnDA		91.0	50.0	150.0
M8FOSA		109.4	50.0	150.0
M8PFOA		96.4	50.0	150.0
M8PFOS		94.7	50.0	150.0
M9-PFNA		95.6	50.0	150.0
MPFBA		90.8	50.0	150.0
MPFDoDA		105.1	50.0	150.0
d3N-MeFOSAA		90.1	50.0	150.0
d5EtFOSAA		92.9	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502.LCSD190502A, Parent Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:23, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		76.0	50.0	150.0
M2-6:2FTSA		83.5	50.0	150.0
M2-8:2FTSA		74.9	50.0	150.0
M2PFTeDA		109.4	12.0	218.0
M3PFBS		101.8	50.0	150.0
M3PFHxS		99.5	50.0	150.0
M4PFHpA		101.9	50.0	150.0
M5PFHxA		103.2	50.0	150.0
M5PFPeA		102.4	50.0	150.0
M6PFDA		99.2	50.0	150.0
M7PFUnDA		91.6	50.0	150.0
M8FOSA		112.8	50.0	150.0
M8PFOA		97.6	50.0	150.0
M8PFOS		92.5	50.0	150.0
M9-PFNA		98.5	50.0	150.0
MPFBA		95.5	50.0	150.0
MPFDoDA		101.4	50.0	150.0
d3N-MeFOSAA		97.5	50.0	150.0
d5EtFOSAA		100.5	50.0	150.0

Matrix Spike (MS)

Lab Sample ID: DQ190502.0105402M, Parent Sample ID: S01054.02

Run in Batch: DQ190502, Run Date: 05/03/2019 02:59, Prep Date: 05/02/2019, Matrix: WW, Dilution: 2.06

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		88.7	50.0	150.0
M2-6:2FTSA	*	210.3	50.0	150.0
M2-8:2FTSA		79.7	50.0	150.0
M2PFTeDA		123.1	12.0	218.0
M3PFBS		55.3	50.0	150.0
M3PFHxS		95.1	50.0	150.0
M4PFHpA		108.1	50.0	150.0
M5PFHxA		104.6	50.0	150.0
M5PFPeA		102.6	50.0	150.0
M6PFDA		101.2	50.0	150.0
M7PFUnDA		120.7	50.0	150.0
M8FOSA		119.5	50.0	150.0
M8PFOA		105.1	50.0	150.0
M8PFOS		110.8	50.0	150.0
M9-PFNA		114.0	50.0	150.0
MPFBA		95.8	50.0	150.0
MPFDoDA		97.1	50.0	150.0
d3N-MeFOSAA		86.0	50.0	150.0
d5EtFOSAA		94.3	50.0	150.0

QC Report - Internal Standards per QC Sample

Duplicate (DUP)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		60.5	50.0	150.0
M2-6:2FTSA		81.0	50.0	150.0
M2-8:2FTSA		75.5	50.0	150.0
M2PFTeDA		96.0	12.0	218.0
M3PFBS		101.2	50.0	150.0
M3PFHxS		94.8	50.0	150.0
M4PFHpA		98.0	50.0	150.0
M5PFHxA		100.1	50.0	150.0
M5PFPeA		102.4	50.0	150.0
M6PFDA		89.2	50.0	150.0
M7PFUnDA		87.7	50.0	150.0
M8FOSA		108.1	50.0	150.0
M8PFOA		97.4	50.0	150.0
M8PFOS		103.4	50.0	150.0
M9-PFNA		97.8	50.0	150.0
MPFBA		98.8	50.0	150.0
MPFDoDA		91.5	50.0	150.0
d3N-MeFOSAA		88.7	50.0	150.0
d5EtFOSAA		83.9	50.0	150.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502.BLK190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:42, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20.0	ng/l
PFPeA		ND	10.0	ng/l
4:2 FTSA		ND	10.0	ng/l
PFHxA		ND	10.0	ng/l
PFBS		ND	10.0	ng/l
PFHpA		ND	10.0	ng/l
PFPeS		ND	10.0	ng/l
6:2 FTSA		ND	10.0	ng/l
PFOA		ND	10.0	ng/l
PFHxS-BR		ND	10.0	ng/l
PFHxS-LN		ND	10.0	ng/l
PFHxS		ND	10.0	ng/l
PFNA		ND	10.0	ng/l
8:2 FTSA		ND	10.0	ng/l
PFHpS		ND	10.0	ng/l
N-MeFOSAA		ND	10.0	ng/l
PFDA		ND	10.0	ng/l
PFOS-BR		ND	10.0	ng/l
EtFOSAA		ND	10.0	ng/l
PFOS		ND	10.0	ng/l
PFOS-LN		ND	10.0	ng/l
PFUnDA		ND	10.0	ng/l
PFNS		ND	10.0	ng/l
PFDoDA		ND	10.0	ng/l
PFDS		ND	10.0	ng/l
PFTTrDA		ND	10.0	ng/l
FOSA		ND	10.0	ng/l
PFTeDA		ND	10.0	ng/l

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		77.4	70.0	130.0
PFPeA		79.0	70.0	130.0
4:2 FTSA		73.7	70.0	130.0
PFHxA		79.0	70.0	130.0
PFBS		75.7	70.0	130.0
PFHpA		79.6	70.0	130.0
PFPeS		73.4	70.0	130.0
6:2 FTSA		85.8	70.0	130.0
PFOA		76.0	70.0	130.0
PFHxS		85.8	70.0	130.0
PFNA		75.5	70.0	130.0
8:2 FTSA		76.4	70.0	130.0
PFHpS		80.2	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
N-MeFOSAA		72.1	70.0	130.0
PFDA		93.2	70.0	130.0
EtFOSAA		77.4	70.0	130.0
PFOS		83.5	70.0	130.0
PFUnDA		75.2	70.0	130.0
PFNS		75.8	70.0	130.0
PFDoDA		72.3	70.0	130.0
PFDS		77.1	70.0	130.0
PFTTrDA		81.0	70.0	130.0
FOSA		86.6	70.0	130.0
PFTeDA		82.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502.LCSD190502A, Parent Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:23, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		88.5	70.0	130.0	13.4	30.0
PFPeA		87.3	70.0	130.0	10.0	30.0
4:2 FTSA	*	100.0	70.0	130.0	30.3	30.0
PFHxA		88.3	70.0	130.0	11.1	30.0
PFBS		90.3	70.0	130.0	17.6	30.0
PFHpA		89.5	70.0	130.0	11.7	30.0
PFPeS		85.4	70.0	130.0	15.1	30.0
6:2 FTSA		89.9	70.0	130.0	4.7	30.0
PFOA		89.8	70.0	130.0	16.6	30.0
PFHxS		93.2	70.0	130.0	8.3	30.0
PFNA		86.5	70.0	130.0	13.6	30.0
8:2 FTSA		103.0	70.0	130.0	29.7	30.0
PFHpS		86.9	70.0	130.0	8.0	30.0
N-MeFOSAA		72.8	70.0	130.0	1.0	30.0
PFDA		85.3	70.0	130.0	8.9	30.0
EtFOSAA		84.4	70.0	130.0	8.7	30.0
PFOS		97.7	70.0	130.0	15.7	30.0
PFUnDA		99.7	70.0	130.0	28.0	30.0
PFNS		94.4	70.0	130.0	21.9	30.0
PFDoDA		84.7	70.0	130.0	15.8	30.0
PFDS		86.2	70.0	130.0	11.1	30.0
PFTTrDA		99.0	70.0	130.0	20.0	30.0
FOSA		95.5	70.0	130.0	9.8	30.0
PFTeDA		94.2	70.0	130.0	12.8	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Matrix Spike (MS)

Lab Sample ID: DQ190502.0105402M, Parent Sample ID: S01054.02

Run in Batch: DQ190502, Run Date: 05/03/2019 02:59, Prep Date: 05/02/2019, Matrix: WW, Dilution: 2.06

Analyte	Flags	% Rec	LCL	UCL
PFBA		98.1	70.0	130.0
PFPeA		86.4	70.0	130.0
4:2 FTSA	*	291.3	70.0	130.0
PFHxA		116.5	70.0	130.0
PFBS	*	48543.7	70.0	130.0
PFHpA		116.5	70.0	130.0
PFPeS	*	189.3	70.0	130.0
6:2 FTSA	*	6796.1	70.0	130.0
PFOA		93.2	70.0	130.0
PFHxS		101.0	70.0	130.0
PFNA		84.5	70.0	130.0
8:2 FTSA	*	194.2	70.0	130.0
PFHpS		106.8	70.0	130.0
N-MeFOSAA		80.6	70.0	130.0
PFDA		95.1	70.0	130.0
EtFOSAA		80.6	70.0	130.0
PFOS	*	679.6	70.0	130.0
PFOA		93.2	70.0	130.0
PFUnDA		85.4	70.0	130.0
PFNS		83.5	70.0	130.0
PFDoDA		97.1	70.0	130.0
PFDS		83.5	70.0	130.0
PFTTrDA		106.8	70.0	130.0
FOSA		97.1	70.0	130.0
PFTeDA		91.3	70.0	130.0

Duplicate (DUP)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
PFBA		NC	30.0
PFPeA		0.0	30.0
4:2 FTSA		NC	30.0
PFHxA		6.3	30.0
PFBS		2.0	30.0
PFHpA		9.1	30.0
PFPeS		NC	30.0
6:2 FTSA	*	30.1	30.0
PFOA		NC	30.0
PFHxS-BR		NC	30.0
PFHxS-LN		NC	30.0
PFHxS		NC	30.0
PFNA		NC	30.0
8:2 FTSA		13.3	30.0
PFHpS		NC	30.0
N-MeFOSAA		NC	30.0
PFDA		NC	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Duplicate (DUP) (continued)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
PFOS-BR	*	34.1	30.0
EtFOSAA		NC	30.0
PFOS	*	31.3	30.0
PFOS-LN	*	32.6	30.0
PFUnDA		NC	30.0
PFNS		NC	30.0
PFDoDA		NC	30.0
PFDS		NC	30.0
PFTTrDA		NC	30.0
FOSA		NC	30.0
PFTeDA		NC	30.0



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C.O.C. PAGE # 1 OF 1

121729

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY O'Brien & Gere
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-337-0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS clifford.yantz@obg.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RACER Coldwater Rd SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider KSK
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

- Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
01268.01	4/25/19	710	02-PRCC-19-MID-237	ww	3	3						
.02	4/25/19	712	02-PRCC-19-PRIM-237	ww	3	3						

PFAS (7977)

X												
X												

Field Blank-042519
 in same cooler
 see col 117146

RELINQUISHED BY: [Signature] Sampler 4/25/19 DATE 12:38 TIME
 RECEIVED BY: [Signature] DATE 4/25/19 TIME 12:38
 RELINQUISHED BY: [Signature] DATE 4/25/19 TIME 10:00
 RECEIVED BY: [Signature] DATE 4/25/19 TIME 10:00

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: TEMP. ON ARRIVAL 4.2



Analytical Laboratory Report

Report ID: S01329.01(01)
Generated on 05/09/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
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Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S01329.01-S01329.02
Project: RACER Coldwater Rd
Collected Date: 04/26/2019
Submitted Date/Time: 04/26/2019 16:00
Sampled by: Kevin Schneider
P.O. #: 11900504

Table of Contents

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7



Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S01329.01	02-PRCC-19-MID-344	Wastewater	04/26/19 07:40
S01329.02	02-PRCC-19-PRIM-344	Wastewater	04/26/19 07:45



Analytical Laboratory Report

Lab Sample ID: S01329.01

Sample Tag: 02-PRCC-19-MID-344

Collected Date/Time: 04/26/2019 07:40

Matrix: Wastewater

COC Reference: 121730

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.3	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 05:15, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.9	375-22-4	
PFPeA*	Not detected	9.5		ng/L	1.9	2706-90-3	
4:2 FTSA*	Not detected	9.5		ng/L	1.9	757124-72-4	
PFHxA*	Not detected	9.5		ng/L	1.9	307-24-4	
PFBS*	Not detected	9.5		ng/L	1.9	375-73-5	
PFHpA*	Not detected	9.5		ng/L	1.9	375-85-9	
PFPeS*	Not detected	9.5		ng/L	1.9	2706-91-4	
6:2 FTSA*	Not detected	9.5		ng/L	1.9	27619-97-2	
PFOA*	Not detected	9.5		ng/L	1.9	335-67-1	
PFHxS*	Not detected	9.5		ng/L	1.9	355-46-4	
PFHxS-LN*	Not detected	9.5		ng/L	1.9	355-46-4-LN	
PFHxS-BR*	Not detected	9.5		ng/L	1.9	355-46-4-BR	
PFNA*	Not detected	9.5		ng/L	1.9	375-95-1	
8:2 FTSA*	Not detected	9.5		ng/L	1.9	39108-34-4	
PFHpS*	Not detected	9.5		ng/L	1.9	375-92-8	
PFDA*	Not detected	9.5		ng/L	1.9	335-76-2	
N-MeFOSAA*	Not detected	9.5		ng/L	1.9	2355-31-9	
EtFOSAA*	Not detected	9.5		ng/L	1.9	2991-50-6	
PFOS*	Not detected	9.5		ng/L	1.9	1763-23-1	
PFOS-LN*	Not detected	9.5		ng/L	1.9	1763-23-1-LN	
PFOS-BR*	Not detected	9.5		ng/L	1.9	1763-23-1-BR	
PFUnDA*	Not detected	9.5		ng/L	1.9	2058-94-8	
PFNS*	Not detected	9.5		ng/L	1.9	474511-07-4	
PFDODA*	Not detected	9.5		ng/L	1.9	307-55-1	
PFDS*	Not detected	9.5		ng/L	1.9	335-77-3	
PFTTrDA*	Not detected	9.5		ng/L	1.9	72629-94-8	
FOSA*	Not detected	9.5		ng/L	1.9	754-91-6	
PFTeDA*	Not detected	9.5		ng/L	1.9	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01329.02

Sample Tag: 02-PRCC-19-PRIM-344

Collected Date/Time: 04/26/2019 07:45

Matrix: Wastewater

COC Reference: 121730

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.3	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/03/19 05:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.98	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	
PFHxA*	Not detected	9.9		ng/L	1.98	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.98	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.98	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.98	335-67-1	
PFHxS*	Not detected	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	
PFOS*	93	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	45	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	49	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	474511-07-4	
PFDoDA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTTrDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	

Merit Laboratories Login Checklist

Lab Set ID:S01329

Client:OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)

Project: RACER Coldwater Rd

Submitted:04/26/2019 16:00 Login User: SRS

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Email: Clifford.Yantz@obg.com

Selection	Description	Note
Sample Receiving		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
Preservation		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____



Quality Control Report

Report ID: QC-S01329-01
Generated on 05/10/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S01329.01-S01329.02
Project: RACER Coldwater Rd
Submitted Date/Time: 04/26/2019 16:00
Sampled by: Kevin Schneider
P.O. #: 11900504

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-3)
Prep Batch Summary (Page 4)
Internal Standards per Lab Sample (Pages 5-6)
Internal Standards per QC Sample (Pages 7-9)
Batch QC Results (Pages 10-13)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S01329.01

Sample Tag: 02-PRCC-19-MID-344

Collected Date/Time: 04/26/2019 07:40

Matrix: Wastewater

COC Reference: 121730

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 05:15	DQ190502	PF190502W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01329.02

Sample Tag: 02-PRCC-19-PRIM-344

Collected Date/Time: 04/26/2019 07:45

Matrix: Wastewater

COC Reference: 121730

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/03/19 05:35	DQ190502	PF190502W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: PF190502W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S01329.01	24 PFAs	ASTMD7979-17M	05/03/19 05:15	DQ190502
S01329.02	24 PFAs	ASTMD7979-17M	05/03/19 05:35	DQ190502

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01329.01

Sample Tag: 02-PRCC-19-MID-344

Collected Date/Time: 04/26/2019 07:40

Matrix: Wastewater

COC Reference: 121730

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502, Run Date: 05/03/2019 05:15, Matrix: WW, Dilution: 1.9

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		82.6	50.0	150.0
M2-6:2FTSA		65.0	50.0	150.0
M2-8:2FTSA		71.2	50.0	150.0
M2PFTeDA		102.9	12.0	218.0
M3PFBS		103.6	50.0	150.0
M3PFHxS		104.2	50.0	150.0
M4PFHpA		103.5	50.0	150.0
M5PFHxA		100.9	50.0	150.0
M5PFPeA		104.8	50.0	150.0
M6PFDA		103.5	50.0	150.0
M7PFUnDA		103.0	50.0	150.0
M8FOSA		118.1	50.0	150.0
M8PFOA		102.9	50.0	150.0
M8PFOS		101.1	50.0	150.0
M9-PFNA		102.6	50.0	150.0
MPFBA		97.2	50.0	150.0
MPFDoDA		97.9	50.0	150.0
d3N-MeFOSAA		91.2	50.0	150.0
d5EtFOSAA		89.6	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01329.02

Sample Tag: 02-PRCC-19-PRIM-344

Collected Date/Time: 04/26/2019 07:45

Matrix: Wastewater

COC Reference: 121730

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190502, Run Date: 05/03/2019 05:35, Matrix: WW, Dilution: 1.98

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		70.4	50.0	150.0
M2-6:2FTSA		72.0	50.0	150.0
M2-8:2FTSA		70.6	50.0	150.0
M2PFTeDA		102.6	12.0	218.0
M3PFBS		104.4	50.0	150.0
M3PFHxS		88.5	50.0	150.0
M4PFHpA		97.3	50.0	150.0
M5PFHxA		97.1	50.0	150.0
M5PFPeA		101.2	50.0	150.0
M6PFDA		92.1	50.0	150.0
M7PFUnDA		91.8	50.0	150.0
M8FOSA		104.6	50.0	150.0
M8PFOA		92.9	50.0	150.0
M8PFOS		101.4	50.0	150.0
M9-PFNA		91.6	50.0	150.0
MPFBA		95.3	50.0	150.0
MPFDoDA		94.9	50.0	150.0
d3N-MeFOSAA		80.2	50.0	150.0
d5EtFOSAA		91.4	50.0	150.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: PF190502W1

QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502.BLK190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:42, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		76.7	50.0	150.0
M2-6:2FTSA		86.4	50.0	150.0
M2-8:2FTSA		75.1	50.0	150.0
M2PFTeDA		102.2	12.0	218.0
M3PFBS		99.5	50.0	150.0
M3PFHxS		91.8	50.0	150.0
M4PFHpA		96.8	50.0	150.0
M5PFHxA		101.3	50.0	150.0
M5PFPeA		98.7	50.0	150.0
M6PFDA		92.1	50.0	150.0
M7PFUnDA		96.9	50.0	150.0
M8FOSA		111.1	50.0	150.0
M8PFOA		96.5	50.0	150.0
M8PFOS		85.7	50.0	150.0
M9-PFNA		94.1	50.0	150.0
MPFBA		93.4	50.0	150.0
MPFDoDA		88.4	50.0	150.0
d3N-MeFOSAA		90.6	50.0	150.0
d5EtFOSAA		87.2	50.0	150.0

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		78.5	50.0	150.0
M2-6:2FTSA		78.8	50.0	150.0
M2-8:2FTSA		74.2	50.0	150.0
M2PFTeDA		121.4	12.0	218.0
M3PFBS		101.1	50.0	150.0
M3PFHxS		96.4	50.0	150.0
M4PFHpA		95.2	50.0	150.0
M5PFHxA		95.4	50.0	150.0
M5PFPeA		95.0	50.0	150.0
M6PFDA		89.6	50.0	150.0
M7PFUnDA		91.0	50.0	150.0
M8FOSA		109.4	50.0	150.0
M8PFOA		96.4	50.0	150.0
M8PFOS		94.7	50.0	150.0
M9-PFNA		95.6	50.0	150.0
MPFBA		90.8	50.0	150.0
MPFDoDA		105.1	50.0	150.0
d3N-MeFOSAA		90.1	50.0	150.0
d5EtFOSAA		92.9	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502.LCSD190502A, Parent Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:23, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		76.0	50.0	150.0
M2-6:2FTSA		83.5	50.0	150.0
M2-8:2FTSA		74.9	50.0	150.0
M2PFTeDA		109.4	12.0	218.0
M3PFBS		101.8	50.0	150.0
M3PFHxS		99.5	50.0	150.0
M4PFHpA		101.9	50.0	150.0
M5PFHxA		103.2	50.0	150.0
M5PFPeA		102.4	50.0	150.0
M6PFDA		99.2	50.0	150.0
M7PFUnDA		91.6	50.0	150.0
M8FOSA		112.8	50.0	150.0
M8PFOA		97.6	50.0	150.0
M8PFOS		92.5	50.0	150.0
M9-PFNA		98.5	50.0	150.0
MPFBA		95.5	50.0	150.0
MPFDoDA		101.4	50.0	150.0
d3N-MeFOSAA		97.5	50.0	150.0
d5EtFOSAA		100.5	50.0	150.0

Matrix Spike (MS)

Lab Sample ID: DQ190502.0105402M, Parent Sample ID: S01054.02

Run in Batch: DQ190502, Run Date: 05/03/2019 02:59, Prep Date: 05/02/2019, Matrix: WW, Dilution: 2.06

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		88.7	50.0	150.0
M2-6:2FTSA	*	210.3	50.0	150.0
M2-8:2FTSA		79.7	50.0	150.0
M2PFTeDA		123.1	12.0	218.0
M3PFBS		55.3	50.0	150.0
M3PFHxS		95.1	50.0	150.0
M4PFHpA		108.1	50.0	150.0
M5PFHxA		104.6	50.0	150.0
M5PFPeA		102.6	50.0	150.0
M6PFDA		101.2	50.0	150.0
M7PFUnDA		120.7	50.0	150.0
M8FOSA		119.5	50.0	150.0
M8PFOA		105.1	50.0	150.0
M8PFOS		110.8	50.0	150.0
M9-PFNA		114.0	50.0	150.0
MPFBA		95.8	50.0	150.0
MPFDoDA		97.1	50.0	150.0
d3N-MeFOSAA		86.0	50.0	150.0
d5EtFOSAA		94.3	50.0	150.0

QC Report - Internal Standards per QC Sample

Duplicate (DUP)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		60.5	50.0	150.0
M2-6:2FTSA		81.0	50.0	150.0
M2-8:2FTSA		75.5	50.0	150.0
M2PFTeDA		96.0	12.0	218.0
M3PFBS		101.2	50.0	150.0
M3PFHxS		94.8	50.0	150.0
M4PFHpA		98.0	50.0	150.0
M5PFHxA		100.1	50.0	150.0
M5PFPeA		102.4	50.0	150.0
M6PFDA		89.2	50.0	150.0
M7PFUnDA		87.7	50.0	150.0
M8FOSA		108.1	50.0	150.0
M8PFOA		97.4	50.0	150.0
M8PFOS		103.4	50.0	150.0
M9-PFNA		97.8	50.0	150.0
MPFBA		98.8	50.0	150.0
MPFDoDA		91.5	50.0	150.0
d3N-MeFOSAA		88.7	50.0	150.0
d5EtFOSAA		83.9	50.0	150.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190502.BLK190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:42, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20.0	ng/l
PFPeA		ND	10.0	ng/l
4:2 FTSA		ND	10.0	ng/l
PFHxA		ND	10.0	ng/l
PFBS		ND	10.0	ng/l
PFHpA		ND	10.0	ng/l
PFPeS		ND	10.0	ng/l
6:2 FTSA		ND	10.0	ng/l
PFOA		ND	10.0	ng/l
PFHxS-BR		ND	10.0	ng/l
PFHxS-LN		ND	10.0	ng/l
PFHxS		ND	10.0	ng/l
PFNA		ND	10.0	ng/l
8:2 FTSA		ND	10.0	ng/l
PFHpS		ND	10.0	ng/l
N-MeFOSAA		ND	10.0	ng/l
PFDA		ND	10.0	ng/l
PFOS-BR		ND	10.0	ng/l
EtFOSAA		ND	10.0	ng/l
PFOS		ND	10.0	ng/l
PFOS-LN		ND	10.0	ng/l
PFUnDA		ND	10.0	ng/l
PFNS		ND	10.0	ng/l
PFDODA		ND	10.0	ng/l
PFDS		ND	10.0	ng/l
PFTTrDA		ND	10.0	ng/l
FOSA		ND	10.0	ng/l
PFTeDA		ND	10.0	ng/l

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		77.4	70.0	130.0
PFPeA		79.0	70.0	130.0
4:2 FTSA		73.7	70.0	130.0
PFHxA		79.0	70.0	130.0
PFBS		75.7	70.0	130.0
PFHpA		79.6	70.0	130.0
PFPeS		73.4	70.0	130.0
6:2 FTSA		85.8	70.0	130.0
PFOA		76.0	70.0	130.0
PFHxS		85.8	70.0	130.0
PFNA		75.5	70.0	130.0
8:2 FTSA		76.4	70.0	130.0
PFHpS		80.2	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:03, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
N-MeFOSAA		72.1	70.0	130.0
PFDA		93.2	70.0	130.0
EtFOSAA		77.4	70.0	130.0
PFOS		83.5	70.0	130.0
PFUnDA		75.2	70.0	130.0
PFNS		75.8	70.0	130.0
PFDoDA		72.3	70.0	130.0
PFDS		77.1	70.0	130.0
PFTTrDA		81.0	70.0	130.0
FOSA		86.6	70.0	130.0
PFTeDA		82.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190502.LCSD190502A, Parent Sample ID: DQ190502.LCS190502A

Run in Batch: DQ190502, Run Date: 05/03/2019 00:23, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		88.5	70.0	130.0	13.4	30.0
PFPeA		87.3	70.0	130.0	10.0	30.0
4:2 FTSA	*	100.0	70.0	130.0	30.3	30.0
PFHxA		88.3	70.0	130.0	11.1	30.0
PFBS		90.3	70.0	130.0	17.6	30.0
PFHpA		89.5	70.0	130.0	11.7	30.0
PFPeS		85.4	70.0	130.0	15.1	30.0
6:2 FTSA		89.9	70.0	130.0	4.7	30.0
PFOA		89.8	70.0	130.0	16.6	30.0
PFHxS		93.2	70.0	130.0	8.3	30.0
PFNA		86.5	70.0	130.0	13.6	30.0
8:2 FTSA		103.0	70.0	130.0	29.7	30.0
PFHpS		86.9	70.0	130.0	8.0	30.0
N-MeFOSAA		72.8	70.0	130.0	1.0	30.0
PFDA		85.3	70.0	130.0	8.9	30.0
EtFOSAA		84.4	70.0	130.0	8.7	30.0
PFOS		97.7	70.0	130.0	15.7	30.0
PFUnDA		99.7	70.0	130.0	28.0	30.0
PFNS		94.4	70.0	130.0	21.9	30.0
PFDoDA		84.7	70.0	130.0	15.8	30.0
PFDS		86.2	70.0	130.0	11.1	30.0
PFTTrDA		99.0	70.0	130.0	20.0	30.0
FOSA		95.5	70.0	130.0	9.8	30.0
PFTeDA		94.2	70.0	130.0	12.8	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Matrix Spike (MS)

Lab Sample ID: DQ190502.0105402M, Parent Sample ID: S01054.02

Run in Batch: DQ190502, Run Date: 05/03/2019 02:59, Prep Date: 05/02/2019, Matrix: WW, Dilution: 2.06

Analyte	Flags	% Rec	LCL	UCL
PFBA		98.1	70.0	130.0
PFPeA		86.4	70.0	130.0
4:2 FTSA	*	291.3	70.0	130.0
PFHxA		116.5	70.0	130.0
PFBS	*	48543.7	70.0	130.0
PFHpA		116.5	70.0	130.0
PFPeS	*	189.3	70.0	130.0
6:2 FTSA	*	6796.1	70.0	130.0
PFOA		93.2	70.0	130.0
PFHxS		101.0	70.0	130.0
PFNA		84.5	70.0	130.0
8:2 FTSA	*	194.2	70.0	130.0
PFHpS		106.8	70.0	130.0
N-MeFOSAA		80.6	70.0	130.0
PFDA		95.1	70.0	130.0
EtFOSAA		80.6	70.0	130.0
PFOS	*	679.6	70.0	130.0
PFUnDA		85.4	70.0	130.0
PFNS		83.5	70.0	130.0
PFDoDA		97.1	70.0	130.0
PFDS		83.5	70.0	130.0
PFTTrDA		106.8	70.0	130.0
FOSA		97.1	70.0	130.0
PFTeDA		91.3	70.0	130.0

Duplicate (DUP)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
PFBA		NC	30.0
PFPeA		0.0	30.0
4:2 FTSA		NC	30.0
PFHxA		6.3	30.0
PFBS		2.0	30.0
PFHpA		9.1	30.0
PFPeS		NC	30.0
6:2 FTSA	*	30.1	30.0
PFOA		NC	30.0
PFHxS-BR		NC	30.0
PFHxS-LN		NC	30.0
PFHxS		NC	30.0
PFNA		NC	30.0
8:2 FTSA		13.3	30.0
PFHpS		NC	30.0
N-MeFOSAA		NC	30.0
PFDA		NC	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190502W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Duplicate (DUP) (continued)

Lab Sample ID: DQ190502.0105401D, Parent Sample ID: S01054.01

Run in Batch: DQ190502, Run Date: 05/03/2019 02:20, Prep Date: 05/02/2019, Matrix: WW, Dilution: 1.88

Analyte	Flags	RPD	RPD CL
PFOS-BR	*	34.1	30.0
EtFOSAA		NC	30.0
PFOS	*	31.3	30.0
PFOS-LN	*	32.6	30.0
PFUnDA		NC	30.0
PFNS		NC	30.0
PFDoDA		NC	30.0
PFDS		NC	30.0
PFTTrDA		NC	30.0
FOSA		NC	30.0
PFTeDA		NC	30.0



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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 121730

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY O'Brien & Gere
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 P.O. NO. _____
 E-MAIL ADDRESS clifford.yantz@obg.com QUOTE NO. _____

CONTACT NAME X SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

PROJECT NO./NAME RACER Coldwater Rd SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider K SCL
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	# Containers & Preservatives	PFAS (7474)	Certifications		Project Locations		Special Instructions
	DATE	TIME													<input type="checkbox"/> OHIO VAP	<input type="checkbox"/> Drinking Water	<input type="checkbox"/> DoD	<input type="checkbox"/> NPDES	
<u>01329.01</u>	<u>4/26/19</u>	<u>740</u>	<u>02-PRCC-19-MID-344</u>	<u>ww</u>	<u>3</u>									<u>X</u>					<u>Field Blank-042519</u>
<u>.02</u>	<u>4/26/19</u>	<u>745</u>	<u>02-PRCC-19-PRM-344</u>	<u>ww</u>	<u>3</u>									<u>X</u>					<u>In same cooler see col 117150</u>

RELINQUISHED BY: K SCL obg ^XSampler DATE 4/26/19 TIME 1500
 RECEIVED BY: JWA Miller DATE 4/26/19 TIME 1500
 RELINQUISHED BY: JWA Miller DATE 4/26/19 TIME 1800
 RECEIVED BY: S. Smith DATE 4/26/19 TIME 1600

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 NOTES: 4,3 TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



Analytical Laboratory Report

Report ID: S01473.01(01)
Generated on 05/15/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

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2680 East Lansing Drive
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Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S01473.01-S01473.03
Project: RACER Coldwater Road Landfill
Collected Date(s): 05/01/2019
Submitted Date/Time: 05/01/2019 13:15
Sampled by: Clifford Yantz
P.O. #: 11900504

Table of Contents

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7



Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S01473.01	02-PRCC-19-Eff-865	Wastewater	05/01/19 09:18
S01473.02	02-PRCC-19-Prim-865	Wastewater	05/01/19 09:25
S01473.03	02-PRCC-19-Mid1-865	Wastewater	05/01/19 09:21



Analytical Laboratory Report

Lab Sample ID: S01473.01

Sample Tag: 02-PRCC-19-Eff-865

Collected Date/Time: 05/01/2019 09:18

Matrix: Wastewater

COC Reference: 117152

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.5	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/10/19 23:21, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.92	375-22-4	
PFPeA*	Not detected	9.6		ng/L	1.92	2706-90-3	
4:2 FTSA*	Not detected	9.6		ng/L	1.92	757124-72-4	
PFHxA*	Not detected	9.6		ng/L	1.92	307-24-4	
PFBS*	Not detected	9.6		ng/L	1.92	375-73-5	
PFHpA*	Not detected	9.6		ng/L	1.92	375-85-9	
PFPeS*	Not detected	9.6		ng/L	1.92	2706-91-4	
6:2 FTSA*	Not detected	9.6		ng/L	1.92	27619-97-2	
PFOA*	Not detected	9.6		ng/L	1.92	335-67-1	
PFHxS*	Not detected	9.6		ng/L	1.92	355-46-4	
PFHxS-LN*	Not detected	9.6		ng/L	1.92	355-46-4-LN	
PFHxS-BR*	Not detected	9.6		ng/L	1.92	355-46-4-BR	
PFNA*	Not detected	9.6		ng/L	1.92	375-95-1	
8:2 FTSA*	Not detected	9.6		ng/L	1.92	39108-34-4	
PFHpS*	Not detected	9.6		ng/L	1.92	375-92-8	
PFDA*	Not detected	9.6		ng/L	1.92	335-76-2	
N-MeFOSAA*	Not detected	9.6		ng/L	1.92	2355-31-9	
EtFOSAA*	Not detected	9.6		ng/L	1.92	2991-50-6	
PFOS*	Not detected	9.6		ng/L	1.92	1763-23-1	
PFOS-LN*	Not detected	9.6		ng/L	1.92	1763-23-1-LN	
PFOS-BR*	Not detected	9.6		ng/L	1.92	1763-23-1-BR	
PFUnDA*	Not detected	9.6		ng/L	1.92	2058-94-8	
PFNS*	Not detected	9.6		ng/L	1.92	474511-07-4	
PFDODA*	Not detected	9.6		ng/L	1.92	307-55-1	
PFDS*	Not detected	9.6		ng/L	1.92	335-77-3	
PFTTrDA*	Not detected	9.6		ng/L	1.92	72629-94-8	
FOSA*	Not detected	9.6		ng/L	1.92	754-91-6	
PFTeDA*	Not detected	9.6		ng/L	1.92	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01473.02

Sample Tag: 02-PRCC-19-Prim-865

Collected Date/Time: 05/01/2019 09:25

Matrix: Wastewater

COC Reference: 117152

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.5	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/10/19 23:40, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	18		ng/L	1.84	375-22-4	
PFPeA*	Not detected	9.2		ng/L	1.84	2706-90-3	
4:2 FTSA*	Not detected	9.2		ng/L	1.84	757124-72-4	
PFHxA*	Not detected	9.2		ng/L	1.84	307-24-4	
PFBS*	Not detected	9.2		ng/L	1.84	375-73-5	
PFHpA*	Not detected	9.2		ng/L	1.84	375-85-9	
PFPeS*	Not detected	9.2		ng/L	1.84	2706-91-4	
6:2 FTSA*	Not detected	9.2		ng/L	1.84	27619-97-2	
PFOA*	Not detected	9.2		ng/L	1.84	335-67-1	
PFHxS*	Not detected	9.2		ng/L	1.84	355-46-4	
PFHxS-LN*	Not detected	9.2		ng/L	1.84	355-46-4-LN	
PFHxS-BR*	Not detected	9.2		ng/L	1.84	355-46-4-BR	
PFNA*	Not detected	9.2		ng/L	1.84	375-95-1	
8:2 FTSA*	Not detected	9.2		ng/L	1.84	39108-34-4	
PFHpS*	Not detected	9.2		ng/L	1.84	375-92-8	
PFDA*	Not detected	9.2		ng/L	1.84	335-76-2	
N-MeFOSAA*	Not detected	9.2		ng/L	1.84	2355-31-9	
EtFOSAA*	Not detected	9.2		ng/L	1.84	2991-50-6	
PFOS*	20	9.2		ng/L	1.84	1763-23-1	
PFOS-LN*	Not detected	9.2		ng/L	1.84	1763-23-1-LN	
PFOS-BR*	13	9.2		ng/L	1.84	1763-23-1-BR	
PFUnDA*	Not detected	9.2		ng/L	1.84	2058-94-8	
PFNS*	Not detected	9.2		ng/L	1.84	474511-07-4	
PFDODA*	Not detected	9.2		ng/L	1.84	307-55-1	
PFDS*	Not detected	9.2		ng/L	1.84	335-77-3	
PFTTrDA*	Not detected	9.2		ng/L	1.84	72629-94-8	
FOSA*	Not detected	9.2		ng/L	1.84	754-91-6	
PFTeDA*	Not detected	9.2		ng/L	1.84	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S01473.03

Sample Tag: 02-PRCC-19-Mid1-865

Collected Date/Time: 05/01/2019 09:21

Matrix: Wastewater

COC Reference: 117152

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.5	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 05/11/19 00:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.9	375-22-4	
PFPeA*	Not detected	9.5		ng/L	1.9	2706-90-3	
4:2 FTSA*	Not detected	9.5		ng/L	1.9	757124-72-4	
PFHxA*	Not detected	9.5		ng/L	1.9	307-24-4	
PFBS*	Not detected	9.5		ng/L	1.9	375-73-5	
PFHpA*	Not detected	9.5		ng/L	1.9	375-85-9	
PFPeS*	Not detected	9.5		ng/L	1.9	2706-91-4	
6:2 FTSA*	Not detected	9.5		ng/L	1.9	27619-97-2	
PFOA*	Not detected	9.5		ng/L	1.9	335-67-1	
PFHxS*	Not detected	9.5		ng/L	1.9	355-46-4	
PFHxS-LN*	Not detected	9.5		ng/L	1.9	355-46-4-LN	
PFHxS-BR*	Not detected	9.5		ng/L	1.9	355-46-4-BR	
PFNA*	Not detected	9.5		ng/L	1.9	375-95-1	
8:2 FTSA*	Not detected	9.5		ng/L	1.9	39108-34-4	
PFHpS*	Not detected	9.5		ng/L	1.9	375-92-8	
PFDA*	Not detected	9.5		ng/L	1.9	335-76-2	
N-MeFOSAA*	Not detected	9.5		ng/L	1.9	2355-31-9	
EtFOSAA*	Not detected	9.5		ng/L	1.9	2991-50-6	
PFOS*	Not detected	9.5		ng/L	1.9	1763-23-1	
PFOS-LN*	Not detected	9.5		ng/L	1.9	1763-23-1-LN	
PFOS-BR*	Not detected	9.5		ng/L	1.9	1763-23-1-BR	
PFUnDA*	Not detected	9.5		ng/L	1.9	2058-94-8	
PFNS*	Not detected	9.5		ng/L	1.9	474511-07-4	
PFDODA*	Not detected	9.5		ng/L	1.9	307-55-1	
PFDS*	Not detected	9.5		ng/L	1.9	335-77-3	
PFTTrDA*	Not detected	9.5		ng/L	1.9	72629-94-8	
FOSA*	Not detected	9.5		ng/L	1.9	754-91-6	
PFTeDA*	Not detected	9.5		ng/L	1.9	376-06-7	

Merit Laboratories Login Checklist

Lab Set ID:S01473

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Client:OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)

Project: RACER Coldwater Road Landfill

Submitted:05/01/2019 13:15 Login User: SRS

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.5 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

Chain of Custody

- | | | |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

Preservation

- | | | |
|-----|--|---|
| 10. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? |

Bottle Conditions

- | | | |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____



2680 East Lansing Dr., East Lansing, MI 48823
 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

117152

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY OBG
 ADDRESS 2260 East Sigmund
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313 333 0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS Clifford.yantz@ramboll.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME PRCER Coldwater Road Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME Clifford Yantz / Clifford Smith
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

PFAS (7979)

- Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
01473.01	5/1/19	09:19	02-PRCC-19-EF-865	WW	3	X						
.02		09:25	02-PRCC-19-Prim-865	WW	3	X						
.03		09:21	02-PRCC-19-mid1-865	WW	3	X						

RELINQUISHED BY: Clifford Smith / OBG *Sampler DATE 5/1/19 TIME 11:15
 RECEIVED BY: [Signature] DATE 5/1/19 TIME 11:15
 RELINQUISHED BY: [Signature] DATE 5/1/19 TIME 13:15
 RECEIVED BY: [Signature] DATE 5/1/19 TIME 13:15

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____

NOTES: TEMP. ON ARRIVAL 4.5



Quality Control Report

Report ID: QC-S01473-01
Generated on 05/20/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S01473.01-S01473.03
Project: RACER Coldwater Road Landfill
Submitted Date/Time: 05/01/2019 13:15
Sampled by: Clifford Yantz
P.O. #: 11900504

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-4)
Prep Batch Summary (Page 5)
Internal Standards per Lab Sample (Pages 6-8)
Internal Standards per QC Sample (Pages 9-11)
Batch QC Results (Pages 12-15)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S01473.01

Sample Tag: 02-PRCC-19-Eff-865

Collected Date/Time: 05/01/2019 09:18

Matrix: Wastewater

COC Reference: 117152

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/10/19 23:21	DQ190510	PF190510W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01473.02

Sample Tag: 02-PRCC-19-Prim-865

Collected Date/Time: 05/01/2019 09:25

Matrix: Wastewater

COC Reference: 117152

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/10/19 23:40	DQ190510	PF190510W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Analysis Summary

Lab Sample ID: S01473.03

Sample Tag: 02-PRCC-19-Mid1-865

Collected Date/Time: 05/01/2019 09:21

Matrix: Wastewater

COC Reference: 117152

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	05/11/19 00:00	DQ190510	PF190510W1	Yes	BLK/LCS/LCSD/MS/DU

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: PF190510W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S01473.01	24 PFAs	ASTMD7979-17M	05/10/19 23:21	DQ190510
S01473.02	24 PFAs	ASTMD7979-17M	05/10/19 23:40	DQ190510
S01473.03	24 PFAs	ASTMD7979-17M	05/11/19 00:00	DQ190510

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01473.01

Sample Tag: 02-PRCC-19-Eff-865

Collected Date/Time: 05/01/2019 09:18

Matrix: Wastewater

COC Reference: 117152

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190510, Run Date: 05/10/2019 23:21, Matrix: WW, Dilution: 1.92

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		98.9	50.0	150.0
M2-6:2FTSA		115.9	50.0	150.0
M2-8:2FTSA		91.3	50.0	150.0
M2PFTeDA		94.0	12.0	218.0
M3PFBS		109.1	50.0	150.0
M3PFHxS		104.4	50.0	150.0
M4PFHpA		105.9	50.0	150.0
M5PFHxA		105.6	50.0	150.0
M5PFPeA		109.7	50.0	150.0
M6PFDA		104.1	50.0	150.0
M7PFUnDA		105.6	50.0	150.0
M8FOSA		109.5	50.0	150.0
M8PFOA		104.6	50.0	150.0
M8PFOS		112.9	50.0	150.0
M9-PFNA		108.8	50.0	150.0
MPFBA		101.6	50.0	150.0
MPFDoDA		99.5	50.0	150.0
d3N-MeFOSAA		109.9	50.0	150.0
d5EtFOSAA		112.5	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01473.02

Sample Tag: 02-PRCC-19-Prim-865

Collected Date/Time: 05/01/2019 09:25

Matrix: Wastewater

COC Reference: 117152

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190510, Run Date: 05/10/2019 23:40, Matrix: WW, Dilution: 1.84

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		86.5	50.0	150.0
M2-6:2FTSA		78.2	50.0	150.0
M2-8:2FTSA		82.5	50.0	150.0
M2PFTeDA		71.6	12.0	218.0
M3PFBS		104.7	50.0	150.0
M3PFHxS		100.8	50.0	150.0
M4PFHpA		102.4	50.0	150.0
M5PFHxA		105.0	50.0	150.0
M5PFPeA		105.8	50.0	150.0
M6PFDA		96.6	50.0	150.0
M7PFUnDA		91.3	50.0	150.0
M8FOSA		99.6	50.0	150.0
M8PFOA		98.5	50.0	150.0
M8PFOS		83.2	50.0	150.0
M9-PFNA		97.1	50.0	150.0
MPFBA		98.6	50.0	150.0
MPFDoDA		81.3	50.0	150.0
d3N-MeFOSAA		102.5	50.0	150.0
d5EtFOSAA		105.2	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S01473.03

Sample Tag: 02-PRCC-19-Mid1-865

Collected Date/Time: 05/01/2019 09:21

Matrix: Wastewater

COC Reference: 117152

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190510, Run Date: 05/11/2019 00:00, Matrix: WW, Dilution: 1.9

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		98.6	50.0	150.0
M2-6:2FTSA		100.6	50.0	150.0
M2-8:2FTSA		81.3	50.0	150.0
M2PFTeDA		69.6	12.0	218.0
M3PFBS		105.5	50.0	150.0
M3PFHxS		94.6	50.0	150.0
M4PFHpA		102.6	50.0	150.0
M5PFHxA		101.8	50.0	150.0
M5PFPeA		107.7	50.0	150.0
M6PFDA		92.3	50.0	150.0
M7PFUnDA		90.1	50.0	150.0
M8FOSA		104.9	50.0	150.0
M8PFOA		98.2	50.0	150.0
M8PFOS		96.7	50.0	150.0
M9-PFNA		102.6	50.0	150.0
MPFBA		102.3	50.0	150.0
MPFDoDA		82.8	50.0	150.0
d3N-MeFOSAA		105.0	50.0	150.0
d5EtFOSAA		102.2	50.0	150.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: PF190510W1

QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190510.BLK190510

Run in Batch: DQ190510, Run Date: 05/10/2019 23:01, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		114.6	50.0	150.0
M2-6:2FTSA		104.2	50.0	150.0
M2-8:2FTSA		77.8	50.0	150.0
M2PFTeDA		117.7	12.0	218.0
M3PFBS		106.2	50.0	150.0
M3PFHxS		98.0	50.0	150.0
M4PFHpA		105.3	50.0	150.0
M5PFHxA		104.1	50.0	150.0
M5PFPeA		110.3	50.0	150.0
M6PFDA		101.9	50.0	150.0
M7PFUnDA		101.9	50.0	150.0
M8FOSA		107.3	50.0	150.0
M8PFOA		107.8	50.0	150.0
M8PFOS		90.4	50.0	150.0
M9-PFNA		100.7	50.0	150.0
MPFBA		107.5	50.0	150.0
MPFDoDA		105.3	50.0	150.0
d3N-MeFOSAA		107.0	50.0	150.0
d5EtFOSAA		122.9	50.0	150.0

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190510.LCS190510

Run in Batch: DQ190510, Run Date: 05/10/2019 22:22, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		115.7	50.0	150.0
M2-6:2FTSA		125.8	50.0	150.0
M2-8:2FTSA		97.3	50.0	150.0
M2PFTeDA		125.2	12.0	218.0
M3PFBS		100.2	50.0	150.0
M3PFHxS		92.2	50.0	150.0
M4PFHpA		107.4	50.0	150.0
M5PFHxA		106.3	50.0	150.0
M5PFPeA		106.7	50.0	150.0
M6PFDA		105.3	50.0	150.0
M7PFUnDA		105.2	50.0	150.0
M8FOSA		112.6	50.0	150.0
M8PFOA		106.3	50.0	150.0
M8PFOS		93.1	50.0	150.0
M9-PFNA		103.5	50.0	150.0
MPFBA		101.4	50.0	150.0
MPFDoDA		109.0	50.0	150.0
d3N-MeFOSAA		107.1	50.0	150.0
d5EtFOSAA		125.9	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190510.LCSD190510, Parent Sample ID: DQ190510.LCS190510

Run in Batch: DQ190510, Run Date: 05/10/2019 22:42, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		106.3	50.0	150.0
M2-6:2FTSA		131.8	50.0	150.0
M2-8:2FTSA		95.4	50.0	150.0
M2PFTeDA		115.0	12.0	218.0
M3PFBS		116.1	50.0	150.0
M3PFHxS		100.3	50.0	150.0
M4PFHpA		103.4	50.0	150.0
M5PFHxA		108.4	50.0	150.0
M5PFPeA		110.2	50.0	150.0
M6PFDA		100.7	50.0	150.0
M7PFUnDA		105.8	50.0	150.0
M8FOSA		114.6	50.0	150.0
M8PFOA		104.1	50.0	150.0
M8PFOS		109.5	50.0	150.0
M9-PFNA		105.7	50.0	150.0
MPFBA		102.5	50.0	150.0
MPFDoDA		98.2	50.0	150.0
d3N-MeFOSAA		122.9	50.0	150.0
d5EtFOSAA		130.6	50.0	150.0

Matrix Spike (MS)

Lab Sample ID: DQ190510.0151402M, Parent Sample ID: S01514.02

Run in Batch: DQ190510, Run Date: 05/11/2019 02:36, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1.97

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		105.9	50.0	150.0
M2-6:2FTSA		98.7	50.0	150.0
M2-8:2FTSA		94.0	50.0	150.0
M2PFTeDA		76.2	12.0	218.0
M3PFBS		105.1	50.0	150.0
M3PFHxS		108.2	50.0	150.0
M4PFHpA		108.4	50.0	150.0
M5PFHxA		107.6	50.0	150.0
M5PFPeA		110.8	50.0	150.0
M6PFDA		105.1	50.0	150.0
M7PFUnDA		98.6	50.0	150.0
M8FOSA		104.2	50.0	150.0
M8PFOA		105.8	50.0	150.0
M8PFOS		100.1	50.0	150.0
M9-PFNA		105.8	50.0	150.0
MPFBA		108.7	50.0	150.0
MPFDoDA		92.3	50.0	150.0
d3N-MeFOSAA		105.6	50.0	150.0
d5EtFOSAA		118.9	50.0	150.0

QC Report - Internal Standards per QC Sample

Duplicate (DUP)

Lab Sample ID: DQ190510.0151401D, Parent Sample ID: S01514.01

Run in Batch: DQ190510, Run Date: 05/11/2019 01:57, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1.96

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA	*	224.5	50.0	150.0
M2-6:2FTSA	*	180.8	50.0	150.0
M2-8:2FTSA		107.2	50.0	150.0
M2PFTeDA		95.3	12.0	218.0
M3PFBS		107.3	50.0	150.0
M3PFHxS		117.2	50.0	150.0
M4PFHpA		104.0	50.0	150.0
M5PFHxA		104.7	50.0	150.0
M5PFPeA		95.7	50.0	150.0
M6PFDA		106.0	50.0	150.0
M7PFUnDA		99.7	50.0	150.0
M8FOSA		123.5	50.0	150.0
M8PFOA		112.6	50.0	150.0
M8PFOS		93.3	50.0	150.0
M9-PFNA		108.7	50.0	150.0
MPFBA		55.5	50.0	150.0
MPFDoDA		90.2	50.0	150.0
d3N-MeFOSAA		88.5	50.0	150.0
d5EtFOSAA		99.6	50.0	150.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190510W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Blank (BLK)

Lab Sample ID: DQ190510.BLK190510

Run in Batch: DQ190510, Run Date: 05/10/2019 23:01, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20.0	ng/l
PFPeA		ND	10.0	ng/l
4:2 FTSA		ND	10.0	ng/l
PFHxA		ND	10.0	ng/l
PFBS		ND	10.0	ng/l
PFHpA		ND	10.0	ng/l
PFPeS		ND	10.0	ng/l
6:2 FTSA		ND	10.0	ng/l
PFOA		ND	10.0	ng/l
PFHxS-BR		ND	10.0	ng/l
PFHxS		ND	10.0	ng/l
PFHxS-LN		ND	10.0	ng/l
PFNA		ND	10.0	ng/l
8:2 FTSA		ND	10.0	ng/l
PFHpS		ND	10.0	ng/l
N-MeFOSAA		ND	10.0	ng/l
PFDA		ND	10.0	ng/l
PFOS-BR		ND	10.0	ng/l
PFOS		ND	10.0	ng/l
EtFOSAA		ND	10.0	ng/l
PFOS-LN		ND	10.0	ng/l
PFUnDA		ND	10.0	ng/l
PFNS		ND	10.0	ng/l
PFDoDA		ND	10.0	ng/l
PFDS		ND	10.0	ng/l
PFTTrDA		ND	10.0	ng/l
FOSA		ND	10.0	ng/l
PFTeDA		ND	10.0	ng/l

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190510.LCS190510

Run in Batch: DQ190510, Run Date: 05/10/2019 22:22, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		73.7	70.0	130.0
PFPeA		71.5	70.0	130.0
4:2 FTSA		72.2	70.0	130.0
PFHxA		74.2	70.0	130.0
PFBS		72.8	70.0	130.0
PFHpA	*	68.4	70.0	130.0
PFPeS	*	67.9	70.0	130.0
6:2 FTSA	*	62.7	70.0	130.0
PFOA		71.3	70.0	130.0
PFHxS		83.2	70.0	130.0
PFNA	*	66.9	70.0	130.0
8:2 FTSA		72.9	70.0	130.0
PFHpS		85.4	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190510W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: DQ190510.LCS190510

Run in Batch: DQ190510, Run Date: 05/10/2019 22:22, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
N-MeFOSAA		76.2	70.0	130.0
PFDA	*	68.7	70.0	130.0
PFOS		80.7	70.0	130.0
EtFOSAA	*	64.5	70.0	130.0
PFUnDA	*	68.1	70.0	130.0
PFNS		86.9	70.0	130.0
PFDoDA		77.1	70.0	130.0
PFDS		83.2	70.0	130.0
PFTTrDA		77.9	70.0	130.0
FOSA		77.9	70.0	130.0
PFTeDA		72.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190510.LCSD190510, Parent Sample ID: DQ190510.LCS190510

Run in Batch: DQ190510, Run Date: 05/10/2019 22:42, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		74.3	70.0	130.0	0.8	30.0
PFPeA		74.3	70.0	130.0	3.8	30.0
4:2 FTSA		74.9	70.0	130.0	3.7	30.0
PFHxA		71.4	70.0	130.0	3.8	30.0
PFBS	*	66.8	70.0	130.0	8.6	30.0
PFHpA		73.5	70.0	130.0	7.2	30.0
PFPeS		71.1	70.0	130.0	4.6	30.0
6:2 FTSA	*	67.3	70.0	130.0	7.1	30.0
PFOA		74.3	70.0	130.0	4.1	30.0
PFHxS		77.4	70.0	130.0	7.2	30.0
PFNA	*	69.9	70.0	130.0	4.4	30.0
8:2 FTSA	*	102.0	70.0	130.0	33.3	30.0
PFHpS		77.8	70.0	130.0	9.3	30.0
N-MeFOSAA		70.3	70.0	130.0	8.1	30.0
PFDA		73.1	70.0	130.0	6.2	30.0
PFOS	*	68.5	70.0	130.0	16.4	30.0
EtFOSAA	*	67.2	70.0	130.0	4.1	30.0
PFUnDA		78.8	70.0	130.0	14.6	30.0
PFNS	*	65.3	70.0	130.0	28.4	30.0
PFDoDA		87.5	70.0	130.0	12.6	30.0
PFDS	*	69.2	70.0	130.0	18.4	30.0
PFTTrDA		91.5	70.0	130.0	16.1	30.0
FOSA		72.9	70.0	130.0	6.6	30.0
PFTeDA		77.4	70.0	130.0	6.3	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190510W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Matrix Spike (MS)

Lab Sample ID: DQ190510.0151402M, Parent Sample ID: S01514.02

Run in Batch: DQ190510, Run Date: 05/11/2019 02:36, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1.97

Analyte	Flags	% Rec	LCL	UCL
PFBA		73.1	70.0	130.0
PFPeA		72.1	70.0	130.0
4:2 FTSA		71.1	70.0	130.0
PFHxA		75.1	70.0	130.0
PFBS		75.1	70.0	130.0
PFHpA		73.1	70.0	130.0
PFPeS		70.1	70.0	130.0
6:2 FTSA		81.2	70.0	130.0
PFOA		72.1	70.0	130.0
PFHxS		71.1	70.0	130.0
PFNA		74.1	70.0	130.0
8:2 FTSA	*	65.0	70.0	130.0
PFHpS	*	66.0	70.0	130.0
PFDA		73.1	70.0	130.0
N-MeFOSAA		76.1	70.0	130.0
EtFOSAA		70.1	70.0	130.0
PFOS	*	68.0	70.0	130.0
PFOA		79.2	70.0	130.0
PFNS		75.1	70.0	130.0
PFDoDA		72.1	70.0	130.0
PFDS		83.2	70.0	130.0
PFTTrDA		77.2	70.0	130.0
FOSA		72.1	70.0	130.0
PFTTeDA	*	58.9	70.0	130.0

Duplicate (DUP)

Lab Sample ID: DQ190510.0151401D, Parent Sample ID: S01514.01

Run in Batch: DQ190510, Run Date: 05/11/2019 01:57, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1.96

Analyte	Flags	RPD	RPD CL
PFBA		0.0	30.0
PFPeA		0.0	30.0
4:2 FTSA		0.0	30.0
PFHxA		3.5	30.0
PFBS		4.5	30.0
PFHpA		2.2	30.0
PFPeS		6.5	30.0
6:2 FTSA		19.4	30.0
PFOA		2.4	30.0
PFHxS-BR		0.0	30.0
PFHxS		0.0	30.0
PFHxS-LN		9.5	30.0
PFNA		0.0	30.0
8:2 FTSA		0.0	30.0
PFHpS		8.5	30.0
N-MeFOSAA		11.0	30.0
PFDA		6.5	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190510W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/DUP

Duplicate (DUP) (continued)

Lab Sample ID: DQ190510.0151401D, Parent Sample ID: S01514.01

Run in Batch: DQ190510, Run Date: 05/11/2019 01:57, Prep Date: 05/10/2019, Matrix: WW, Dilution: 1.96

Analyte	Flags	RPD	RPD CL
PFOS-BR		15.7	30.0
PFOS		5.8	30.0
EtFOSAA		17.1	30.0
PFOS-LN		2.9	30.0
PFUnDA		5.7	30.0
PFNS		NC	30.0
PFDoDA		8.7	30.0
PFDS		NC	30.0
PFTTrDA		NC	30.0
FOSA		5.7	30.0
PFTeDA		NC	30.0



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C.O.C. PAGE # 1 OF 1

117152

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz
 COMPANY OBG
 ADDRESS 2260 East Sigmund
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313 333 0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS Clifford.Yantz@ramboll.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME PRCER Coldwater Road Landfill II SAMPLER(S) - PLEASE PRINT/SIGN NAME Clifford Yantz / Clifford Smith
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

PFAS (7979)

Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
01473.01	5/1/19	09:19	02-PRCC-19-EF-865	WW	3	X						
.02		09:25	02-PRCC-19-Prim-865	WW	3	X						
.03		09:21	02-PRCC-19-mid1-865	WW	3	X						

X
X
X

RELINQUISHED BY: Clifford Yantz / OBG *Sampler DATE 5/1/19 TIME 11:15
 RECEIVED BY: [Signature] DATE 5/1/19 TIME 11:15
 RELINQUISHED BY: [Signature] DATE 5/1/19 TIME 13:15
 RECEIVED BY: [Signature] DATE 5/1/19 TIME 13:15

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: TEMP. ON ARRIVAL 4.5

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



Analytical Laboratory Report

Report ID: S02366.01(01)
Generated on 06/13/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S02366.01-S02366.05
Project: 72202.037130 RACER Coldwater Rd Landfill
Collected Date(s): 05/22/2019
Submitted Date/Time: 05/23/2019 12:45
Sampled by: Unknown
P.O. #: 11900504

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7



Analytical Laboratory Report

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S02366.01	Field Blank-5-22-19	Liquid	05/22/19 09:30
S02366.02	02-PRCC-19-Eff-3077	Liquid	05/22/19 09:35
S02366.03	02-PRCC-19-Mid 2-3077	Liquid	05/22/19 09:38
S02366.04	02-PRCC-19-Mid 1-3077	Liquid	05/22/19 09:42
S02366.05	02-PRCC-19-Prim-3077	Liquid	05/22/19 09:48



Analytical Laboratory Report

Lab Sample ID: S02366.01

Sample Tag: Field Blank-5-22-19

Collected Date/Time: 05/22/2019 09:30

Matrix: Liquid

COC Reference: 121780

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 06/11/19 22:40, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	21		ng/L	2.05	375-22-4	
PFPeA*	Not detected	10		ng/L	2.05	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.05	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.05	307-24-4	
PFBS*	Not detected	10		ng/L	2.05	375-73-5	
PFHpA*	Not detected	10		ng/L	2.05	375-85-9	
PFPeS*	Not detected	10		ng/L	2.05	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.05	27619-97-2	
PFOA*	Not detected	10		ng/L	2.05	335-67-1	
PFHxS*	Not detected	10		ng/L	2.05	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.05	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.05	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.05	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.05	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.05	375-92-8	
PFDA*	Not detected	10		ng/L	2.05	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.05	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.05	2991-50-6	
PFOS*	Not detected	10		ng/L	2.05	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.05	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.05	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.05	2058-94-8	
PFNS*	Not detected	10		ng/L	2.05	474511-07-4	
PFDODA*	Not detected	10		ng/L	2.05	307-55-1	
PFDS*	Not detected	10		ng/L	2.05	335-77-3	
PFTTrDA*	Not detected	10		ng/L	2.05	72629-94-8	
FOSA*	Not detected	10		ng/L	2.05	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.05	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S02366.02

Sample Tag: 02-PRCC-19-Eff-3077

Collected Date/Time: 05/22/2019 09:35

Matrix: Liquid

COC Reference: 121780

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 06/11/19 23:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.85	375-22-4	
PFPeA*	Not detected	9.3		ng/L	1.85	2706-90-3	
4:2 FTSA*	Not detected	9.3		ng/L	1.85	757124-72-4	
PFHxA*	Not detected	9.3		ng/L	1.85	307-24-4	
PFBS*	Not detected	9.3		ng/L	1.85	375-73-5	
PFHpA*	Not detected	9.3		ng/L	1.85	375-85-9	
PFPeS*	Not detected	9.3		ng/L	1.85	2706-91-4	
6:2 FTSA*	Not detected	9.3		ng/L	1.85	27619-97-2	
PFOA*	Not detected	9.3		ng/L	1.85	335-67-1	
PFHxS*	Not detected	9.3		ng/L	1.85	355-46-4	
PFHxS-LN*	Not detected	9.3		ng/L	1.85	355-46-4-LN	
PFHxS-BR*	Not detected	9.3		ng/L	1.85	355-46-4-BR	
PFNA*	Not detected	9.3		ng/L	1.85	375-95-1	
8:2 FTSA*	Not detected	9.3		ng/L	1.85	39108-34-4	
PFHpS*	Not detected	9.3		ng/L	1.85	375-92-8	
PFDA*	Not detected	9.3		ng/L	1.85	335-76-2	
N-MeFOSAA*	Not detected	9.3		ng/L	1.85	2355-31-9	
EtFOSAA*	Not detected	9.3		ng/L	1.85	2991-50-6	
PFOS*	Not detected	9.3		ng/L	1.85	1763-23-1	
PFOS-LN*	Not detected	9.3		ng/L	1.85	1763-23-1-LN	
PFOS-BR*	Not detected	9.3		ng/L	1.85	1763-23-1-BR	
PFUnDA*	Not detected	9.3		ng/L	1.85	2058-94-8	
PFNS*	Not detected	9.3		ng/L	1.85	474511-07-4	
PFDODA*	Not detected	9.3		ng/L	1.85	307-55-1	
PFDS*	Not detected	9.3		ng/L	1.85	335-77-3	
PFTTrDA*	Not detected	9.3		ng/L	1.85	72629-94-8	
FOSA*	Not detected	9.3		ng/L	1.85	754-91-6	
PFTeDA*	Not detected	9.3		ng/L	1.85	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S02366.03

Sample Tag: 02-PRCC-19-Mid 2-3077

Collected Date/Time: 05/22/2019 09:38

Matrix: Liquid

COC Reference: 121780

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 06/11/19 23:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	18		ng/L	1.81	375-22-4	
PFPeA*	Not detected	9.1		ng/L	1.81	2706-90-3	
4:2 FTSA*	Not detected	9.1		ng/L	1.81	757124-72-4	
PFHxA*	Not detected	9.1		ng/L	1.81	307-24-4	
PFBS*	Not detected	9.1		ng/L	1.81	375-73-5	
PFHpA*	Not detected	9.1		ng/L	1.81	375-85-9	
PFPeS*	Not detected	9.1		ng/L	1.81	2706-91-4	
6:2 FTSA*	Not detected	9.1		ng/L	1.81	27619-97-2	
PFOA*	Not detected	9.1		ng/L	1.81	335-67-1	
PFHxS*	Not detected	9.1		ng/L	1.81	355-46-4	
PFHxS-LN*	Not detected	9.1		ng/L	1.81	355-46-4-LN	
PFHxS-BR*	Not detected	9.1		ng/L	1.81	355-46-4-BR	
PFNA*	Not detected	9.1		ng/L	1.81	375-95-1	
8:2 FTSA*	Not detected	9.1		ng/L	1.81	39108-34-4	
PFHpS*	Not detected	9.1		ng/L	1.81	375-92-8	
PFDA*	Not detected	9.1		ng/L	1.81	335-76-2	
N-MeFOSAA*	Not detected	9.1		ng/L	1.81	2355-31-9	
EtFOSAA*	Not detected	9.1		ng/L	1.81	2991-50-6	
PFOS*	Not detected	9.1		ng/L	1.81	1763-23-1	
PFOS-LN*	Not detected	9.1		ng/L	1.81	1763-23-1-LN	
PFOS-BR*	Not detected	9.1		ng/L	1.81	1763-23-1-BR	
PFUnDA*	Not detected	9.1		ng/L	1.81	2058-94-8	
PFNS*	Not detected	9.1		ng/L	1.81	474511-07-4	
PFDODA*	Not detected	9.1		ng/L	1.81	307-55-1	
PFDS*	Not detected	9.1		ng/L	1.81	335-77-3	
PFTTrDA*	Not detected	9.1		ng/L	1.81	72629-94-8	
FOSA*	Not detected	9.1		ng/L	1.81	754-91-6	
PFTeDA*	Not detected	9.1		ng/L	1.81	376-06-7	



Analytical Laboratory Report

Lab Sample ID: S02366.04

Sample Tag: 02-PRCC-19-Mid 1-3077

Collected Date/Time: 05/22/2019 09:42

Matrix: Liquid

COC Reference: 121780

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 06/11/19 23:39, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	18		ng/L	1.81	375-22-4	
PFPeA*	Not detected	9.1		ng/L	1.81	2706-90-3	
4:2 FTSA*	Not detected	9.1		ng/L	1.81	757124-72-4	
PFHxA*	Not detected	9.1		ng/L	1.81	307-24-4	
PFBS*	Not detected	9.1		ng/L	1.81	375-73-5	
PFHpA*	Not detected	9.1		ng/L	1.81	375-85-9	
PFPeS*	Not detected	9.1		ng/L	1.81	2706-91-4	
6:2 FTSA*	Not detected	9.1		ng/L	1.81	27619-97-2	I
PFOA*	Not detected	9.1		ng/L	1.81	335-67-1	
PFHxS*	Not detected	9.1		ng/L	1.81	355-46-4	
PFHxS-LN*	Not detected	9.1		ng/L	1.81	355-46-4-LN	
PFHxS-BR*	Not detected	9.1		ng/L	1.81	355-46-4-BR	
PFNA*	Not detected	9.1		ng/L	1.81	375-95-1	
8:2 FTSA*	Not detected	9.1		ng/L	1.81	39108-34-4	
PFHpS*	Not detected	9.1		ng/L	1.81	375-92-8	
PFDA*	Not detected	9.1		ng/L	1.81	335-76-2	
N-MeFOSAA*	Not detected	9.1		ng/L	1.81	2355-31-9	
EtFOSAA*	Not detected	9.1		ng/L	1.81	2991-50-6	
PFOS*	Not detected	9.1		ng/L	1.81	1763-23-1	
PFOS-LN*	Not detected	9.1		ng/L	1.81	1763-23-1-LN	
PFOS-BR*	Not detected	9.1		ng/L	1.81	1763-23-1-BR	
PFUnDA*	Not detected	9.1		ng/L	1.81	2058-94-8	
PFNS*	Not detected	9.1		ng/L	1.81	474511-07-4	
PFDODA*	Not detected	9.1		ng/L	1.81	307-55-1	
PFDS*	Not detected	9.1		ng/L	1.81	335-77-3	
PFTTrDA*	Not detected	9.1		ng/L	1.81	72629-94-8	
FOSA*	Not detected	9.1		ng/L	1.81	754-91-6	
PFTeDA*	Not detected	9.1		ng/L	1.81	376-06-7	

I-Matrix interference with internal standard



Analytical Laboratory Report

Lab Sample ID: S02366.05

Sample Tag: 02-PRCC-19-Prim-3077

Collected Date/Time: 05/22/2019 09:48

Matrix: Liquid

COC Reference: 121780

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Organics

24 PFAs, Method: ASTM D7979-17M, Run Date: 06/12/19 00:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.87	375-22-4	
PFPeA*	Not detected	9.4		ng/L	1.87	2706-90-3	
4:2 FTSA*	Not detected	9.4		ng/L	1.87	757124-72-4	
PFHxA*	Not detected	9.4		ng/L	1.87	307-24-4	
PFBS*	Not detected	9.4		ng/L	1.87	375-73-5	
PFHpA*	Not detected	9.4		ng/L	1.87	375-85-9	
PFPeS*	Not detected	9.4		ng/L	1.87	2706-91-4	
6:2 FTSA*	Not detected	9.4		ng/L	1.87	27619-97-2	
PFOA*	Not detected	9.4		ng/L	1.87	335-67-1	
PFHxS*	Not detected	9.4		ng/L	1.87	355-46-4	
PFHxS-LN*	Not detected	9.4		ng/L	1.87	355-46-4-LN	
PFHxS-BR*	Not detected	9.4		ng/L	1.87	355-46-4-BR	
PFNA*	Not detected	9.4		ng/L	1.87	375-95-1	
8:2 FTSA*	Not detected	9.4		ng/L	1.87	39108-34-4	
PFHpS*	Not detected	9.4		ng/L	1.87	375-92-8	
PFDA*	Not detected	9.4		ng/L	1.87	335-76-2	
N-MeFOSAA*	Not detected	9.4		ng/L	1.87	2355-31-9	
EtFOSAA*	Not detected	9.4		ng/L	1.87	2991-50-6	
PFOS*	24	9.4		ng/L	1.87	1763-23-1	
PFOS-LN*	14	9.4		ng/L	1.87	1763-23-1-LN	
PFOS-BR*	9.7	9.4		ng/L	1.87	1763-23-1-BR	
PFUnDA*	Not detected	9.4		ng/L	1.87	2058-94-8	
PFNS*	Not detected	9.4		ng/L	1.87	474511-07-4	
PFDoDA*	Not detected	9.4		ng/L	1.87	307-55-1	
PFDS*	Not detected	9.4		ng/L	1.87	335-77-3	
PFTTrDA*	Not detected	9.4		ng/L	1.87	72629-94-8	
FOSA*	Not detected	9.4		ng/L	1.87	754-91-6	
PFTeDA*	Not detected	9.4		ng/L	1.87	376-06-7	

Merit Laboratories Login Checklist

Lab Set ID:S02366

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Client:OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)

Project: 72202.037130 RACER Coldwater Rd Landfill

Submitted:05/23/2019 12:45 Login User: SRS

Phone: 313-333-0211 FAX:

Email: Clifford.Yantz@obg.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

Chain of Custody

- | | | |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

Preservation

- | | | |
|-----|--|---|
| 10. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? |

Bottle Conditions

- | | | |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____



2680 East Lansing Dr., East Lansing, MI 48823
 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 121780

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME: Clifford S. Yantz
 COMPANY: OBG, Part of Ramboll
 ADDRESS: 2260 East Saginaw
 CITY: East Lansing STATE: MI ZIP CODE: 48823
 PHONE NO.: 313 3330211 FAX NO.: — P.O. NO.: —
 E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com QUOTE NO.: —

CONTACT NAME: OBG
 COMPANY: —
 ADDRESS: —
 CITY: — STATE: — ZIP CODE: —
 PHONE NO.: — E-MAIL ADDRESS: —

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 22202.037180 PRCC Coldwater Rd Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME: —
 TURNAROUND TIME REQUIRED: 1 DAY 2 DAYS 3 DAYS STANDARD OTHER
 DELIVERABLES REQUIRED: STD LEVEL II LEVEL III LEVEL IV EDD OTHER

Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
02306.01	5/22/19	09:30	Field Blank-5-22-19	L	2	X						
.02	↓	09:35	02-PRCC-19-Eff-3077	L	3	X						
.03	↓	09:38	02-PRCC-19-Mid 2-3077	L	3	X						
.04	↓	09:42	02-PRCC-19-Mid 1-3077	L	3	X						
.05	↓	09:48	02-PRCC-19-Prim-3077	L	3	X						

PPAS (7979)

RELINQUISHED BY: Clifford Yantz / OBG Sampler DATE: 5/29/19 TIME: 11:02
 RECEIVED BY: John Arhille DATE: 5/23/19 TIME: 11:00
 RELINQUISHED BY: John Arhille DATE: 5/23/19 TIME: 12:41
 RECEIVED BY: John Arhille DATE: 5/23/19 TIME: 12:45

RELINQUISHED BY: _____ DATE: _____ TIME: _____
 RECEIVED BY: _____ DATE: _____ TIME: _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: 428 TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



Quality Control Report

Report ID: QC-S02366-01
Generated on 06/14/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S02366.01-S02366.05
Project: 72202.037130 RACER Coldwater Rd Landfill
Submitted Date/Time: 05/23/2019 12:45
Sampled by: Unknown
P.O. #: 11900504

QC Report Sections

- Cover Page (Page 1)
- Analysis Summary (Pages 2-6)
- Prep Batch Summary (Page 7)
- Internal Standards per Lab Sample (Pages 8-12)
- Internal Standards per QC Sample (Pages 13-15)
- Batch QC Results (Pages 16-19)

Report Flag Descriptions

- *: QC result is outside of indicated control limits
- W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S02366.01

Sample Tag: Field Blank-5-22-19

Collected Date/Time: 05/22/2019 09:30

Matrix: Liquid

COC Reference: 121780

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	06/11/19 22:40	DQ190611	PF190611W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S02366.02

Sample Tag: 02-PRCC-19-Eff-3077

Collected Date/Time: 05/22/2019 09:35

Matrix: Liquid

COC Reference: 121780

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	06/11/19 23:00	DQ190611	PF190611W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S02366.03

Sample Tag: 02-PRCC-19-Mid 2-3077

Collected Date/Time: 05/22/2019 09:38

Matrix: Liquid

COC Reference: 121780

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	06/11/19 23:20	DQ190611	PF190611W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S02366.04

Sample Tag: 02-PRCC-19-Mid 1-3077

Collected Date/Time: 05/22/2019 09:42

Matrix: Liquid

COC Reference: 121780

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	06/11/19 23:39	DQ190611	PF190611W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S02366.05

Sample Tag: 02-PRCC-19-Prim-3077

Collected Date/Time: 05/22/2019 09:48

Matrix: Liquid

COC Reference: 121780

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
24 PFAs	ASTMD7979-17M	06/12/19 00:00	DQ190611	PF190611W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: PF190611W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S02366.01	24 PFAs	ASTMD7979-17M	06/11/19 22:40	DQ190611
S02366.02	24 PFAs	ASTMD7979-17M	06/11/19 23:00	DQ190611
S02366.03	24 PFAs	ASTMD7979-17M	06/11/19 23:20	DQ190611
S02366.04	24 PFAs	ASTMD7979-17M	06/11/19 23:39	DQ190611
S02366.05	24 PFAs	ASTMD7979-17M	06/12/19 00:00	DQ190611

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S02366.01

Sample Tag: Field Blank-5-22-19

Collected Date/Time: 05/22/2019 09:30

Matrix: Liquid

COC Reference: 121780

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190611, Run Date: 06/11/2019 22:40, Matrix: WW, Dilution: 2.05

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		57.9	50.0	150.0
M2-6:2FTSA		53.2	50.0	150.0
M2-8:2FTSA		71.1	50.0	150.0
M2PFTeDA		103.9	12.0	218.0
M3PFBS		99.0	50.0	150.0
M3PFHxS		100.6	50.0	150.0
M4PFHpA		98.1	50.0	150.0
M5PFHxA		96.7	50.0	150.0
M5PFPeA		99.2	50.0	150.0
M6PFDA		101.2	50.0	150.0
M7PFUnDA		99.7	50.0	150.0
M8FOSA		104.7	50.0	150.0
M8PFOA		98.1	50.0	150.0
M8PFOS		101.2	50.0	150.0
M9-PFNA		99.8	50.0	150.0
MPFBA		100.8	50.0	150.0
MPFDoDA		94.0	50.0	150.0
d3N-MeFOSAA		80.4	50.0	150.0
d5EtFOSAA		75.3	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S02366.02

Sample Tag: 02-PRCC-19-Eff-3077

Collected Date/Time: 05/22/2019 09:35

Matrix: Liquid

COC Reference: 121780

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190611, Run Date: 06/11/2019 23:00, Matrix: WW, Dilution: 1.85

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		59.0	50.0	150.0
M2-6:2FTSA		67.5	50.0	150.0
M2-8:2FTSA		71.3	50.0	150.0
M2PFTeDA		82.8	12.0	218.0
M3PFBS		107.6	50.0	150.0
M3PFHxS		95.4	50.0	150.0
M4PFHpA		95.7	50.0	150.0
M5PFHxA		102.8	50.0	150.0
M5PFPeA		101.9	50.0	150.0
M6PFDA		100.8	50.0	150.0
M7PFUnDA		99.2	50.0	150.0
M8FOSA		108.0	50.0	150.0
M8PFOA		96.0	50.0	150.0
M8PFOS		100.1	50.0	150.0
M9-PFNA		96.1	50.0	150.0
MPFBA		102.5	50.0	150.0
MPFDoDA		91.5	50.0	150.0
d3N-MeFOSAA		77.2	50.0	150.0
d5EtFOSAA		77.2	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S02366.03

Sample Tag: 02-PRCC-19-Mid 2-3077

Collected Date/Time: 05/22/2019 09:38

Matrix: Liquid

COC Reference: 121780

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190611, Run Date: 06/11/2019 23:20, Matrix: WW, Dilution: 1.81

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		58.7	50.0	150.0
M2-6:2FTSA		72.4	50.0	150.0
M2-8:2FTSA		64.0	50.0	150.0
M2PFTeDA		63.4	12.0	218.0
M3PFBS		98.2	50.0	150.0
M3PFHxS		102.1	50.0	150.0
M4PFHpA		98.8	50.0	150.0
M5PFHxA		96.3	50.0	150.0
M5PFPeA		95.8	50.0	150.0
M6PFDA		95.7	50.0	150.0
M7PFUnDA		92.3	50.0	150.0
M8FOSA		101.7	50.0	150.0
M8PFOA		102.0	50.0	150.0
M8PFOS		116.0	50.0	150.0
M9-PFNA		102.9	50.0	150.0
MPFBA		99.5	50.0	150.0
MPFDoDA		85.8	50.0	150.0
d3N-MeFOSAA		86.1	50.0	150.0
d5EtFOSAA		76.0	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S02366.04

Sample Tag: 02-PRCC-19-Mid 1-3077

Collected Date/Time: 05/22/2019 09:42

Matrix: Liquid

COC Reference: 121780

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190611, Run Date: 06/11/2019 23:39, Matrix: WW, Dilution: 1.81

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		56.0	50.0	150.0
M2-6:2FTSA	*	43.4	50.0	150.0
M2-8:2FTSA		50.2	50.0	150.0
M2PFTeDA		71.0	12.0	218.0
M3PFBS		92.1	50.0	150.0
M3PFHxS		101.2	50.0	150.0
M4PFHpA		87.1	50.0	150.0
M5PFHxA		86.7	50.0	150.0
M5PFPeA		87.2	50.0	150.0
M6PFDA		80.3	50.0	150.0
M7PFUnDA		76.8	50.0	150.0
M8FOSA		85.2	50.0	150.0
M8PFOA		86.7	50.0	150.0
M8PFOS		99.0	50.0	150.0
M9-PFNA		85.3	50.0	150.0
MPFBA		92.0	50.0	150.0
MPFDoDA		81.4	50.0	150.0
d3N-MeFOSAA		66.2	50.0	150.0
d5EtFOSAA		71.6	50.0	150.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S02366.05

Sample Tag: 02-PRCC-19-Prim-3077

Collected Date/Time: 05/22/2019 09:48

Matrix: Liquid

COC Reference: 121780

Organics - Volatiles, Analysis: 24 PFAs

Run in Batch: DQ190611, Run Date: 06/12/2019 00:00, Matrix: WW, Dilution: 1.87

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		63.4	50.0	150.0
M2-6:2FTSA		54.9	50.0	150.0
M2-8:2FTSA		57.5	50.0	150.0
M2PFTeDA		84.3	12.0	218.0
M3PFBS		97.5	50.0	150.0
M3PFHxS		109.7	50.0	150.0
M4PFHpA		97.0	50.0	150.0
M5PFHxA		98.0	50.0	150.0
M5PFPeA		97.5	50.0	150.0
M6PFDA		94.7	50.0	150.0
M7PFUnDA		92.5	50.0	150.0
M8FOSA		105.0	50.0	150.0
M8PFOA		98.2	50.0	150.0
M8PFOS		102.4	50.0	150.0
M9-PFNA		90.7	50.0	150.0
MPFBA		101.0	50.0	150.0
MPFDoDA		87.8	50.0	150.0
d3N-MeFOSAA		77.3	50.0	150.0
d5EtFOSAA		80.8	50.0	150.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: PF190611W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: DQ190611.BLK1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 17:10, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		57.3	50.0	150.0
M2-6:2FTSA		54.3	50.0	150.0
M2-8:2FTSA		57.0	50.0	150.0
M2PFTeDA		99.9	12.0	218.0
M3PFBS		98.0	50.0	150.0
M3PFHxS		90.2	50.0	150.0
M4PFHpA		96.7	50.0	150.0
M5PFHxA		94.5	50.0	150.0
M5PFPeA		94.4	50.0	150.0
M6PFDA		92.3	50.0	150.0
M7PFUnDA		97.0	50.0	150.0
M8FOSA		106.8	50.0	150.0
M8PFOA		99.4	50.0	150.0
M8PFOS		106.0	50.0	150.0
M9-PFNA		94.9	50.0	150.0
MPFBA		101.3	50.0	150.0
MPFDoDA		93.0	50.0	150.0
d3N-MeFOSAA		77.1	50.0	150.0
d5EtFOSAA		73.7	50.0	150.0

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190611.LCS1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 18:41, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		54.7	50.0	150.0
M2-6:2FTSA		58.1	50.0	150.0
M2-8:2FTSA		65.2	50.0	150.0
M2PFTeDA		71.5	12.0	218.0
M3PFBS		102.5	50.0	150.0
M3PFHxS		98.7	50.0	150.0
M4PFHpA		99.1	50.0	150.0
M5PFHxA		97.1	50.0	150.0
M5PFPeA		95.0	50.0	150.0
M6PFDA		97.1	50.0	150.0
M7PFUnDA		95.8	50.0	150.0
M8FOSA		109.1	50.0	150.0
M8PFOA		98.2	50.0	150.0
M8PFOS		106.3	50.0	150.0
M9-PFNA		94.8	50.0	150.0
MPFBA		101.0	50.0	150.0
MPFDoDA		87.2	50.0	150.0
d3N-MeFOSAA		85.2	50.0	150.0
d5EtFOSAA		78.3	50.0	150.0

QC Report - Internal Standards per QC Sample

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190611.LCSD1906111, Parent Sample ID: DQ190611.LCS1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 19:01, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		59.9	50.0	150.0
M2-6:2FTSA		67.2	50.0	150.0
M2-8:2FTSA		65.1	50.0	150.0
M2PFTeDA		92.5	12.0	218.0
M3PFBS		100.7	50.0	150.0
M3PFHxS		104.4	50.0	150.0
M4PFHpA		96.2	50.0	150.0
M5PFHxA		97.4	50.0	150.0
M5PFPeA		97.6	50.0	150.0
M6PFDA		95.1	50.0	150.0
M7PFUnDA		96.8	50.0	150.0
M8FOSA		101.3	50.0	150.0
M8PFOA		97.9	50.0	150.0
M8PFOS		91.8	50.0	150.0
M9-PFNA		98.5	50.0	150.0
MPFBA		100.1	50.0	150.0
MPFDoDA		95.4	50.0	150.0
d3N-MeFOSAA		74.7	50.0	150.0
d5EtFOSAA		79.0	50.0	150.0

Matrix Spike (MS)

Lab Sample ID: DQ190611.0249128M, Parent Sample ID: S02491.27

Run in Batch: DQ190611, Run Date: 06/12/2019 00:59, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1.91

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		54.2	50.0	150.0
M2-6:2FTSA		63.4	50.0	150.0
M2-8:2FTSA		65.9	50.0	150.0
M2PFTeDA		81.8	12.0	218.0
M3PFBS		104.1	50.0	150.0
M3PFHxS		101.3	50.0	150.0
M4PFHpA		96.5	50.0	150.0
M5PFHxA		96.9	50.0	150.0
M5PFPeA		99.5	50.0	150.0
M6PFDA		95.9	50.0	150.0
M7PFUnDA		96.8	50.0	150.0
M8FOSA		101.7	50.0	150.0
M8PFOA		96.1	50.0	150.0
M8PFOS		103.3	50.0	150.0
M9-PFNA		91.7	50.0	150.0
MPFBA		101.1	50.0	150.0
MPFDoDA		86.6	50.0	150.0
d3N-MeFOSAA		67.0	50.0	150.0
d5EtFOSAA		67.7	50.0	150.0

QC Report - Internal Standards per QC Sample

Matrix Spike Duplicate (MSD)

Lab Sample ID: DQ190611.0249129N, Parent Sample ID: DQ190611.0249128M

Run in Batch: DQ190611, Run Date: 06/12/2019 01:19, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1.89

Internal Standard	Flags	%Rec	LCL	UCL
M2-4:2FTSA		52.3	50.0	150.0
M2-6:2FTSA	*	48.4	50.0	150.0
M2-8:2FTSA		65.4	50.0	150.0
M2PFTeDA		78.7	12.0	218.0
M3PFBS		104.9	50.0	150.0
M3PFHxS		98.0	50.0	150.0
M4PFHpA		98.9	50.0	150.0
M5PFHxA		97.7	50.0	150.0
M5PFPeA		100.0	50.0	150.0
M6PFDA		96.5	50.0	150.0
M7PFUnDA		92.3	50.0	150.0
M8FOSA		107.3	50.0	150.0
M8PFOA		98.5	50.0	150.0
M8PFOS		108.8	50.0	150.0
M9-PFNA		91.2	50.0	150.0
MPFBA		103.7	50.0	150.0
MPFDoDA		87.4	50.0	150.0
d3N-MeFOSAA		75.0	50.0	150.0
d5EtFOSAA		84.2	50.0	150.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190611W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: DQ190611.BLK1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 17:10, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
PFBA		ND	20.0	ng/l
PFPeA		ND	10.0	ng/l
4:2 FTSA		ND	10.0	ng/l
PFHxA		ND	10.0	ng/l
PFBS		ND	10.0	ng/l
PFHpA		ND	10.0	ng/l
PFPeS		ND	10.0	ng/l
6:2 FTSA		ND	10.0	ng/l
PFOA		ND	10.0	ng/l
PFHxS-LN		ND	10.0	ng/l
PFHxS		ND	10.0	ng/l
PFHxS-BR		ND	10.0	ng/l
PFNA		ND	10.0	ng/l
8:2 FTSA		ND	10.0	ng/l
PFHpS		ND	10.0	ng/l
N-MeFOSAA		ND	10.0	ng/l
PFDA		ND	10.0	ng/l
PFOS-BR		ND	10.0	ng/l
EtFOSAA		ND	10.0	ng/l
PFOS		ND	10.0	ng/l
PFOS-LN		ND	10.0	ng/l
PFUnDA		ND	10.0	ng/l
PFNS		ND	10.0	ng/l
PFDoDA		ND	10.0	ng/l
FOSA		ND	10.0	ng/l
PFDS		ND	10.0	ng/l
PFTTrDA		ND	10.0	ng/l
PFTeDA		ND	10.0	ng/l

Laboratory Control Sample (LCS)

Lab Sample ID: DQ190611.LCS1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 18:41, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
PFBA		99.8	70.0	130.0
PFPeA		98.3	70.0	130.0
4:2 FTSA		92.3	70.0	130.0
PFHxA		97.7	70.0	130.0
PFBS		97.7	70.0	130.0
PFHpA		89.2	70.0	130.0
PFPeS		98.5	70.0	130.0
6:2 FTSA		109.0	70.0	130.0
PFOA		94.8	70.0	130.0
PFHxS		112.0	70.0	130.0
PFNA		98.9	70.0	130.0
8:2 FTSA		110.0	70.0	130.0
PFHpS		98.7	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190611W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: DQ190611.LCS1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 18:41, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
N-MeFOSAA		81.4	70.0	130.0
PFDA		89.4	70.0	130.0
EtFOSAA		107.0	70.0	130.0
PFOS		91.8	70.0	130.0
PFUnDA		94.9	70.0	130.0
PFNS		94.4	70.0	130.0
PFDoDA		105.0	70.0	130.0
FOSA		86.9	70.0	130.0
PFDS		88.1	70.0	130.0
PFTTrDA		87.1	70.0	130.0
PFTeDA		108.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: DQ190611.LCSD1906111, Parent Sample ID: DQ190611.LCS1906111

Run in Batch: DQ190611, Run Date: 06/11/2019 19:01, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		98.8	70.0	130.0	1.0	30.0
PFPeA		96.3	70.0	130.0	2.1	30.0
4:2 FTSA		91.3	70.0	130.0	1.1	30.0
PFHxA		101.0	70.0	130.0	3.3	30.0
PFBS		96.7	70.0	130.0	1.0	30.0
PFHpA		93.9	70.0	130.0	5.1	30.0
PFPeS		102.0	70.0	130.0	3.5	30.0
6:2 FTSA	*	75.6	70.0	130.0	36.2	30.0
PFOA		96.3	70.0	130.0	1.6	30.0
PFHxS		94.5	70.0	130.0	16.9	30.0
PFNA		95.2	70.0	130.0	3.8	30.0
8:2 FTSA		82.9	70.0	130.0	28.1	30.0
PFHpS		97.5	70.0	130.0	1.2	30.0
N-MeFOSAA	*	120.0	70.0	130.0	38.3	30.0
PFDA		96.1	70.0	130.0	7.2	30.0
EtFOSAA		105.0	70.0	130.0	1.9	30.0
PFOS		118.0	70.0	130.0	25.0	30.0
PFUnDA		91.3	70.0	130.0	3.9	30.0
PFNS		107.0	70.0	130.0	12.5	30.0
PFDoDA		92.9	70.0	130.0	12.2	30.0
FOSA		101.0	70.0	130.0	15.0	30.0
PFDS		110.0	70.0	130.0	22.1	30.0
PFTTrDA		91.2	70.0	130.0	4.6	30.0
PFTeDA		106.0	70.0	130.0	1.9	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190611W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS)

Lab Sample ID: DQ190611.0249128M, Parent Sample ID: S02491.27

Run in Batch: DQ190611, Run Date: 06/12/2019 00:59, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1.91

Analyte	Flags	% Rec	LCL	UCL
PFBA		104.7	70.0	130.0
PFPeA		104.7	70.0	130.0
4:2 FTSA		104.7	70.0	130.0
PFHxA		104.7	70.0	130.0
PFBS		104.7	70.0	130.0
PFHpA		99.5	70.0	130.0
PFPeS		95.3	70.0	130.0
6:2 FTSA		84.8	70.0	130.0
PFOA		105.0	70.0	130.0
PFHxS		104.7	70.0	130.0
PFNA		102.6	70.0	130.0
8:2 FTSA		103.7	70.0	130.0
PFHpS		104.7	70.0	130.0
PFDA		89.0	70.0	130.0
N-MeFOSAA	*	136.1	70.0	130.0
EtFOSAA		115.2	70.0	130.0
PFOS		101.6	70.0	130.0
PFUnDA		100.5	70.0	130.0
PFNS		96.3	70.0	130.0
PFDoDA		104.7	70.0	130.0
PFDS		100.5	70.0	130.0
PFTTrDA		95.3	70.0	130.0
FOSA		99.5	70.0	130.0
PFTeDA		97.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: DQ190611.0249129N, Parent Sample ID: DQ190611.0249128M

Run in Batch: DQ190611, Run Date: 06/12/2019 01:19, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1.89

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFBA		101.6	70.0	130.0	4.1	30.0
PFPeA		97.4	70.0	130.0	8.3	30.0
4:2 FTSA		95.2	70.0	130.0	10.5	30.0
PFHxA		104.8	70.0	130.0	1.0	30.0
PFBS		103.7	70.0	130.0	2.0	30.0
PFHpA		92.1	70.0	130.0	8.8	30.0
PFPeS		94.2	70.0	130.0	2.2	30.0
6:2 FTSA	*	116.4	70.0	130.0	30.4	30.0
PFOA		95.6	70.0	130.0	9.5	30.0
PFHxS		105.8	70.0	130.0	0.0	30.0
PFNA		105.8	70.0	130.0	2.0	30.0
8:2 FTSA		116.4	70.0	130.0	10.5	30.0
PFHpS		93.1	70.0	130.0	12.8	30.0
PFDA		84.7	70.0	130.0	6.1	30.0
N-MeFOSAA		116.4	70.0	130.0	16.7	30.0
EtFOSAA		98.4	70.0	130.0	16.7	30.0
PFOS		99.5	70.0	130.0	3.1	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: PF190611W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: DQ190611.0249129N, Parent Sample ID: DQ190611.0249128M

Run in Batch: DQ190611, Run Date: 06/12/2019 01:19, Prep Date: 06/11/2019, Matrix: WW, Dilution: 1.89

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
PFUnDA		96.3	70.0	130.0	5.3	30.0
PFNS		93.1	70.0	130.0	4.4	30.0
PFDoDA		105.8	70.0	130.0	0.0	30.0
PFDS		93.1	70.0	130.0	8.7	30.0
PFTTrDA		88.9	70.0	130.0	8.0	30.0
FOSA		95.2	70.0	130.0	5.4	30.0
PFTeDA		101.6	70.0	130.0	3.2	30.0



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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 121780

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME: Clifford S. Yantz
 COMPANY: OBG, Part of Ramboll
 ADDRESS: 2260 East Saginaw
 CITY: East Lansing STATE: MI ZIP CODE: 48823
 PHONE NO.: 313 3330211 FAX NO.: — P.O. NO.: —
 E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com QUOTE NO.: —

CONTACT NAME: X
 COMPANY: —
 ADDRESS: —
 CITY: — STATE: — ZIP CODE: —
 PHONE NO.: — E-MAIL ADDRESS: —

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 22202.037180 PRCC Coldwater Rd Landfill SAMPLER(S) - PLEASE PRINT/SIGN NAME: —
 TURNAROUND TIME REQUIRED: 1 DAY 2 DAYS 3 DAYS STANDARD OTHER
 DELIVERABLES REQUIRED: STD LEVEL II LEVEL III LEVEL IV EDD OTHER

Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other —
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PPAS (7979)
	DATE	TIME											
02306.01	5/22/19	09:30	Field Blank-5-22-19	L	2	X							X
.02		09:35	02-PRCC-19-Eff-3077	L	3	X							X
.03		09:38	02-PRCC-19-Mid 2-3077	L	3	X							X
.04		09:42	02-PRCC-19-Mid 1-3077	L	3	X							X
.05		09:48	02-PRCC-19-Prim-3077	L	3	X							X

RELINQUISHED BY: Clifford Yantz / OBG Sampler DATE: 5/29/19 TIME: 11:02
 RECEIVED BY: John Arhille DATE: 5/23/19 TIME: 11:00
 RELINQUISHED BY: John Arhille DATE: 5/23/19 TIME: 12:41
 RECEIVED BY: John Arhille DATE: 5/23/19 TIME: 12:45

RELINQUISHED BY: _____ DATE: _____ TIME: _____
 RECEIVED BY: _____ DATE: _____ TIME: _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 SEAL NO. SEAL INTACT YES NO INITIALS _____
 NOTES: 428 TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE