10-May-2021

Joe Hebert
Ottawa County Road Commission
P.O. Box 739
Grand Haven, MI 49417

Re: **West Central Ottawa WWTP** Work Order: **21042488**

Dear Joe,

ALS Environmental received 1 sample on 28-Apr-2021 01:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 21.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

**Report of Laboratory Analysis**

Certificate No: MN 026-999-449

## ALS Group, USA

Date: 10-May-21

**Client:** Ottawa County Road Commission
**Project:** West Central Ottawa WWTP
**Work Order:** **21042488**

# Work Order Sample Summary

| Lab Samp ID | Client Sample ID | Matrix | Tag Number | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| 21042488-01 | S-2 West Sludge Tank | Sludge | | 4/28/2021 12:30 | 4/28/2021 13:00 | ☐ |

# ALS Group, USA

Date: 10-May-21

**Client:** Ottawa County Road Commission
**Project:** West Central Ottawa WWTP
**WorkOrder:** **21042488**

## QUALIFIERS, ACRONYMS, UNITS

| Qualifier | Description |
|---|---|
| * | Value exceeds Regulatory Limit |
| ** | Estimated Value |
| a | Analyte is non-accredited |
| B | Analyte detected in the associated Method Blank above the Reporting Limit |
| E | Value above quantitation range |
| H | Analyzed outside of Holding Time |
| Hr | BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated. |
| J | Analyte is present at an estimated concentration between the MDL and Report Limit |
| ND | Not Detected at the Reporting Limit |
| O | Sample amount is > 4 times amount spiked |
| P | Dual Column results percent difference > 40% |
| R | RPD above laboratory control limit |
| S | Spike Recovery outside laboratory control limits |
| U | Analyzed but not detected above the MDL |
| X | Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level. |

| Acronym | Description |
|---|---|
| DUP | Method Duplicate |
| LCS | Laboratory Control Sample |
| LCSD | Laboratory Control Sample Duplicate |
| LOD | Limit of Detection (see MDL) |
| LOQ | Limit of Quantitation (see PQL) |
| MBLK | Method Blank |
| MDL | Method Detection Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| PQL | Practical Quantitation Limit |
| RPD | Relative Percent Difference |
| TDL | Target Detection Limit |
| TNTC | Too Numerous To Count |
| A | APHA Standard Methods |
| D | ASTM |
| E | EPA |
| SW | SW-846 Update III |

| Units Reported | Description |
|---|---|
| % of sample | Percent of Sample |
| µg/Kg-dry | Micrograms per Kilogram Dry Weight |

**Client:** Ottawa County Road Commission
**Project:** West Central Ottawa WWTP
**Work Order:** 21042488

# Case Narrative

Batch 176080, Method D7968-17a, Sample S-2 West Sludge Tank (21042488-01A): Surrogate high due to matrix interference. d3-N-MeFOSAA, d5-N-EtFOSAA

Batch 176080, Method D7968-17a, Sample S-2 West Sludge Tank (21042488-01A): One or more surrogate recoveries were below the lower control limits. The sample results may be biased low, 13C2-PFTeA

Batch 176080, Method D7968-17a, Sample S-2 West Sludge Tank (21042488-01A): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 13C2-FtS 4:2, 13C2-FtS 6:2, 13C2-FtS 8:2

# ALS Group, USA

**Date:** *10-May-21*

**Client:** Ottawa County Road Commission
**Project:** West Central Ottawa WWTP
**Sample ID:** S-2 West Sludge Tank
**Collection Date:** 4/28/2021 12:30 PM

**Work Order:** 21042488
**Lab ID:** 21042488-01
**Matrix:** SLUDGE

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **PFAS BY LC-MS-MS** | | Method: **D7968-17A** | | | Prep: D7968-17a / 5/3/21 | | Analyst: **SK** |
| Perfluorobutanoic Acid (PFBA) | U | | 1.7 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| **Perfluoropentanoic Acid (PFPeA)** | **1.4** | J | **0.66** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluorohexanoic Acid (PFHxA)** | **2.7** | J | **0.60** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluoroheptanoic Acid (PFHpA)** | **1.0** | J | **0.66** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluorooctanoic Acid (PFOA)** | **4.5** | | **0.44** | **0.98** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluorononanoic Acid (PFNA)** | **4.2** | | **0.49** | **0.98** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluorodecanoic Acid (PFDA)** | **11** | | **0.76** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluoroundecanoic Acid (PFUnA)** | **1.5** | J | **0.84** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **Perfluorododecanoic Acid (PFDoA)** | **2.9** | J | **1.0** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| Perfluorotridecanoic Acid (PFTriA) | U | | 1.1 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Perfluorotetradecanoic Acid (PFTeA) | U | | 1.6 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Perfluorobutanesulfonic Acid (PFBS) | U | | 0.66 | 0.98 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Perfluoropentanesulfonic Acid (PFPeS) | U | | 0.54 | 0.98 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| **Perfluorohexanesulfonic Acid (PFHxS)** | **0.96** | J | **0.94** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| Perfluoroheptanesulfonic Acid (PFHpS) | U | | 0.85 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| **Perfluorooctanesulfonic Acid (PFOS)** | **10** | | **0.41** | **0.98** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| Perfluorononanesulfonic Acid (PFNS) | U | | 0.85 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| **Perfluorodecanesulfonic Acid (PFDS)** | **1.6** | | **0.51** | **0.98** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2) | U | | 1.1 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2) | U | | 1.9 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2) | U | | 2.3 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| **Perfluorooctanesulfonamide (PFOSA)** | **1.6** | | **0.33** | **0.98** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **N-Ethylperfluorooctanesulfonamidoacetic Acid** | **8.2** | | **1.9** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| **N-Methylperfluorooctanesulfonamidoacetic Acid** | **17** | | **1.2** | **4.9** | **µg/Kg-dry** | 1 | 5/6/2021 19:11 |
| 11Cl-Pf3OUdS | U | | 0.40 | 0.98 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| 4,8-Dioxa-3H-perfluorononanoic Acid (DONA) | U | | 0.24 | 0.98 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| 9Cl-PF3ONS | U | | 0.19 | 0.98 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| Hexafluoropropylene oxide dimer acid (HFPO-DA) | U | | 4.0 | 4.9 | µg/Kg-dry | 1 | 5/6/2021 19:11 |
| *Surr: 13C4-PFBA* | *81.7* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C5-PFPeA* | *79.6* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *10-May-21*

**Client:** Ottawa County Road Commission
**Project:** West Central Ottawa WWTP
**Sample ID:** S-2 West Sludge Tank
**Collection Date:** 4/28/2021 12:30 PM

**Work Order:** 21042488
**Lab ID:** 21042488-01
**Matrix:** SLUDGE

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| *Surr: 13C2-PFHxA* | *81.9* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C4-PFHpA* | *84.2* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C4-PFOA* | *88.6* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C5-PFNA* | *94.4* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-PFDA* | *91.9* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-PFUnA* | *103* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-PFDoA* | *92.8* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-PFTeA* | *41.2* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C3-PFBS* | *74.3* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 18O2-PFHxS* | *78.4* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C4-PFOS* | *70.2* | | | *70-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-FtS 4:2* | *174* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-FtS 6:2* | *223* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C2-FtS 8:2* | *182* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C8-FOSA* | *85.6* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: d3-N-MeFOSAA* | *134* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: d5-N-EtFOSAA* | *149* | S | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| *Surr: 13C3-HFPO-DA* | *80.7* | | | *50-130* | *%REC* | 1 | 5/6/2021 19:11 |
| **MOISTURE** | | Method: **SW3550C** | | | | | Analyst: **KTP** |
| **Moisture** | **97** | | **0.10** | **0.10** | **% of sample** | 1 | 5/4/2021 15:09 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

**MBLK1** Sample ID: **MBLK1-176080-176080** Units: **ng/Kg** Analysis Date: **5/6/2021 05:26 PM**

Client ID: Run ID: **LCMS1_210506B** SeqNo: **7372303** Prep Date: **5/3/2021** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Perfluorobutanoic Acid (PFBA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluoropentanoic Acid (PFPeA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorohexanoic Acid (PFHxA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluoroheptanoic Acid (PFHpA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorooctanoic Acid (PFOA) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Perfluorononanoic Acid (PFNA) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Perfluorodecanoic Acid (PFDA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluoroundecanoic Acid (PFUnA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorododecanoic Acid (PFDoA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorotridecanoic Acid (PFTriA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorotetradecanoic Acid (PFTeA) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorobutanesulfonic Acid (PFBS) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Perfluorohexanesulfonic Acid (PFHxS) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluoroheptanesulfonic Acid (PFHpS | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Perfluorononanesulfonic Acid (PFNS) | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | U | 120 | 0 | 0 | 0 | | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | U | 25 | 0 | 0 | 0 | | 0 | | | |
| N-Ethylperfluorooctanesulfonamidoace | 53.03 | 120 | 0 | 0 | 0 | | 0 | | | J |
| N-Methylperfluorooctanesulfonamidoa | U | 120 | 0 | 0 | 0 | | 0 | | | |
| 11Cl-Pf3OUdS | U | 25 | 0 | 0 | 0 | | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | U | 25 | 0 | 0 | 0 | | 0 | | | |
| 9Cl-PF3ONS | U | 25 | 0 | 0 | 0 | | 0 | | | |
| Hexafluoropropylene oxide dimer acid | U | 120 | 0 | 0 | 0 | | 0 | | | |
| *Surr: 13C4-PFBA* | *431.2* | 0 | *400* | 0 | *108* | *50-130* | 0 | | | |
| *Surr: 13C5-PFPeA* | *428.3* | 0 | *400* | 0 | *107* | *50-130* | 0 | | | |
| *Surr: 13C2-PFHxA* | *441.7* | 0 | *400* | 0 | *110* | *50-130* | 0 | | | |
| *Surr: 13C4-PFHpA* | *423* | 0 | *400* | 0 | *106* | *50-130* | 0 | | | |
| *Surr: 13C4-PFOA* | *440.5* | 0 | *400* | 0 | *110* | *70-130* | 0 | | | |
| *Surr: 13C5-PFNA* | *442.3* | 0 | *400* | 0 | *111* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDA* | *416.5* | 0 | *400* | 0 | *104* | *70-130* | 0 | | | |
| *Surr: 13C2-PFUnA* | *383.2* | 0 | *400* | 0 | *95.8* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDoA* | *312.8* | 0 | *400* | 0 | *78.2* | *70-130* | 0 | | | |
| *Surr: 13C2-PFTeA* | *211.1* | 0 | *400* | 0 | *52.8* | *50-130* | 0 | | | |
| *Surr: 13C3-PFBS* | *399.5* | 0 | *400* | 0 | *99.9* | *50-130* | 0 | | | |
| *Surr: 18O2-PFHxS* | *412.4* | 0 | *378* | 0 | *109* | *70-130* | 0 | | | |
| *Surr: 13C4-PFOS* | *413.4* | 0 | *383* | 0 | *108* | *70-130* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 4:2* | *362.2* | 0 | *373* | 0 | *97.1* | *50-130* | 0 |
| *Surr: 13C2-FtS 6:2* | *329.4* | 0 | *380* | 0 | *86.7* | *50-130* | 0 |
| *Surr: 13C2-FtS 8:2* | *366.7* | 0 | *383* | 0 | *95.7* | *50-130* | 0 |
| *Surr: 13C8-FOSA* | *391.6* | 0 | *400* | 0 | *97.9* | *50-130* | 0 |
| *Surr: d3-N-MeFOSAA* | *408.1* | 0 | *400* | 0 | *102* | *50-130* | 0 |
| *Surr: d5-N-EtFOSAA* | *474.4* | 0 | *400* | 0 | *119* | *50-130* | 0 |
| *Surr: 13C3-HFPO-DA* | *412.6* | 0 | *400* | 0 | *103* | *50-130* | 0 |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| **MBLK2** | Sample ID: **MBLK2-176080-176080** | | | | Units: **ng/Kg** | | | Analysis Date: **5/6/2021 06:08 PM** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | | Run ID: **LCMS1_210506B** | | | SeqNo: **7372307** | | | Prep Date: **5/3/2021** | | DF: **1** | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | | RPD Ref Value | %RPD | RPD Limit | Qual |
| Perfluorobutanoic Acid (PFBA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluoropentanoic Acid (PFPeA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorohexanoic Acid (PFHxA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluoroheptanoic Acid (PFHpA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorooctanoic Acid (PFOA) | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorononanoic Acid (PFNA) | 14.08 | 25 | 0 | 0 | 0 | | | 0 | | | J |
| Perfluorodecanoic Acid (PFDA) | 19.98 | 120 | 0 | 0 | 0 | | | 0 | | | J |
| Perfluoroundecanoic Acid (PFUnA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorododecanoic Acid (PFDoA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorotridecanoic Acid (PFTriA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorotetradecanoic Acid (PFTeA) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorobutanesulfonic Acid (PFBS) | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorohexanesulfonic Acid (PFHxS) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluoroheptanesulfonic Acid (PFHpS | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorononanesulfonic Acid (PFNS) | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| N-Ethylperfluorooctanesulfonamidoace | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| N-Methylperfluorooctanesulfonamidoa | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| 11Cl-Pf3OUdS | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| 9Cl-PF3ONS | U | 25 | 0 | 0 | 0 | | | 0 | | | |
| Hexafluoropropylene oxide dimer acid | U | 120 | 0 | 0 | 0 | | | 0 | | | |
| *Surr: 13C4-PFBA* | *439.3* | 0 | *400* | 0 | *110* | *50-130* | | 0 | | | |
| *Surr: 13C5-PFPeA* | *447.8* | 0 | *400* | 0 | *112* | *50-130* | | 0 | | | |
| *Surr: 13C2-PFHxA* | *454.7* | 0 | *400* | 0 | *114* | *50-130* | | 0 | | | |
| *Surr: 13C4-PFHpA* | *442.9* | 0 | *400* | 0 | *111* | *50-130* | | 0 | | | |
| *Surr: 13C4-PFOA* | *418.6* | 0 | *400* | 0 | *105* | *70-130* | | 0 | | | |
| *Surr: 13C5-PFNA* | *449.8* | 0 | *400* | 0 | *112* | *70-130* | | 0 | | | |
| *Surr: 13C2-PFDA* | *439.9* | 0 | *400* | 0 | *110* | *70-130* | | 0 | | | |
| *Surr: 13C2-PFUnA* | *435.2* | 0 | *400* | 0 | *109* | *70-130* | | 0 | | | |
| *Surr: 13C2-PFDoA* | *424.7* | 0 | *400* | 0 | *106* | *70-130* | | 0 | | | |
| *Surr: 13C2-PFTeA* | *394.8* | 0 | *400* | 0 | *98.7* | *50-130* | | 0 | | | |
| *Surr: 13C3-PFBS* | *408.1* | 0 | *400* | 0 | *102* | *50-130* | | 0 | | | |
| *Surr: 18O2-PFHxS* | *423.2* | 0 | *378* | 0 | *112* | *70-130* | | 0 | | | |
| *Surr: 13C4-PFOS* | *414.7* | 0 | *383* | 0 | *108* | *70-130* | | 0 | | | |
| *Surr: 13C2-FtS 4:2* | *343.9* | 0 | *373* | 0 | *92.2* | *50-130* | | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 6:2* | *353.1* | 0 | *380* | 0 | *92.9* | *50-130* | 0 |
| *Surr: 13C2-FtS 8:2* | *342.5* | 0 | *383* | 0 | *89.4* | *50-130* | 0 |
| *Surr: 13C8-FOSA* | *403.7* | 0 | *400* | 0 | *101* | *50-130* | 0 |
| *Surr: d3-N-MeFOSAA* | *499.5* | 0 | *400* | 0 | *125* | *50-130* | 0 |
| *Surr: d5-N-EtFOSAA* | *516.1* | 0 | *400* | 0 | *129* | *50-130* | 0 |
| *Surr: 13C3-HFPO-DA* | *407.8* | 0 | *400* | 0 | *102* | *50-130* | 0 |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

**MS** Sample ID: **21050022-16A MS** Units: **ng/Kg** Analysis Date: **5/6/2021 06:18 PM**

Client ID: Run ID: **LCMS1_210506B** SeqNo: **7372308** Prep Date: **5/3/2021** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Perfluorobutanoic Acid (PFBA) | 498.8 | 130 | 502.5 | 47.31 | 89.8 | 50-130 | 0 | | | |
| Perfluoropentanoic Acid (PFPeA) | 493.8 | 130 | 502.5 | 40.23 | 90.3 | 70-130 | 0 | | | |
| Perfluorohexanoic Acid (PFHxA) | 519.5 | 130 | 502.5 | 61.43 | 91.1 | 50-130 | 0 | | | |
| Perfluoroheptanoic Acid (PFHpA) | 529.7 | 130 | 502.5 | 66.75 | 92.1 | 50-130 | 0 | | | |
| Perfluorooctanoic Acid (PFOA) | 613.9 | 25 | 502.5 | 161.1 | 90.1 | 70-130 | 0 | | | |
| Perfluorononanoic Acid (PFNA) | 569.2 | 25 | 502.5 | 79.78 | 97.4 | 70-130 | 0 | | | |
| Perfluorodecanoic Acid (PFDA) | 524.6 | 130 | 502.5 | 40.53 | 96.3 | 70-130 | 0 | | | |
| Perfluoroundecanoic Acid (PFUnA) | 463.3 | 130 | 502.5 | 11.29 | 90 | 70-130 | 0 | | | |
| Perfluorododecanoic Acid (PFDoA) | 495.5 | 130 | 502.5 | 27.38 | 93.2 | 70-130 | 0 | | | |
| Perfluorotridecanoic Acid (PFTriA) | 571.4 | 130 | 502.5 | 0 | 114 | 70-130 | 0 | | | |
| Perfluorotetradecanoic Acid (PFTeA) | 601.7 | 130 | 502.5 | 0.6463 | 120 | 70-130 | 0 | | | |
| Perfluorobutanesulfonic Acid (PFBS) | 416.9 | 25 | 444.2 | 23.29 | 88.6 | 70-130 | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | 429.6 | 25 | 471.4 | 7.695 | 89.5 | 70-130 | 0 | | | |
| Perfluorohexanesulfonic Acid (PFHxS) | 442.5 | 130 | 457.3 | 33.6 | 89.4 | 70-130 | 0 | | | |
| Perfluoroheptanesulfonic Acid (PFHpS | 422.1 | 130 | 478.4 | 10.72 | 86 | 70-130 | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | 563.5 | 25 | 466.3 | 167.4 | 84.9 | 70-130 | 0 | | | |
| Perfluorononanesulfonic Acid (PFNS) | 448.7 | 130 | 482.4 | 0 | 93 | 70-130 | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | 432.1 | 25 | 484.4 | 14.75 | 86.2 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | 548 | 130 | 469.3 | 3.006 | 116 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | 528 | 130 | 476.4 | 0 | 111 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | 450.7 | 130 | 481.4 | 0 | 93.6 | 70-130 | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | 471.6 | 25 | 502.5 | 0 | 93.9 | 70-130 | 0 | | | |
| N-Ethylperfluorooctanesulfonamidoace | 613 | 130 | 502.5 | 0 | 122 | 70-130 | 0 | | | |
| N-Methylperfluorooctanesulfonamidoa | 581.5 | 130 | 502.5 | 0 | 116 | 70-130 | 0 | | | |
| 11Cl-Pf3OUdS | 407.3 | 25 | 473.4 | 6.341 | 84.7 | 70-130 | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | 413.7 | 25 | 473.4 | 1.412 | 87.1 | 70-130 | 0 | | | |
| 9Cl-PF3ONS | 448.6 | 25 | 468.3 | 2.383 | 95.3 | 70-130 | 0 | | | |
| Hexafluoropropylene oxide dimer acid | 395.5 | 130 | 502.5 | 0 | 78.7 | 50-130 | 0 | | | |
| *Surr: 13C4-PFBA* | *419.4* | 0 | *402* | 0 | *104* | *50-130* | 0 | | | |
| *Surr: 13C5-PFPeA* | *407.8* | 0 | *402* | 0 | *101* | *50-130* | 0 | | | |
| *Surr: 13C2-PFHxA* | *427.7* | 0 | *402* | 0 | *106* | *50-130* | 0 | | | |
| *Surr: 13C4-PFHpA* | *430.9* | 0 | *402* | 0 | *107* | *50-130* | 0 | | | |
| *Surr: 13C4-PFOA* | *411.9* | 0 | *402* | 0 | *102* | *70-130* | 0 | | | |
| *Surr: 13C5-PFNA* | *429.9* | 0 | *402* | 0 | *107* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDA* | *430.3* | 0 | *402* | 0 | *107* | *70-130* | 0 | | | |
| *Surr: 13C2-PFUnA* | *450.1* | 0 | *402* | 0 | *112* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDoA* | *418.7* | 0 | *402* | 0 | *104* | *70-130* | 0 | | | |
| *Surr: 13C2-PFTeA* | *409.8* | 0 | *402* | 0 | *102* | *50-130* | 0 | | | |
| *Surr: 13C3-PFBS* | *389.4* | 0 | *402* | 0 | *96.9* | *50-130* | 0 | | | |
| *Surr: 18O2-PFHxS* | *387* | 0 | *379.9* | 0 | *102* | *70-130* | 0 | | | |
| *Surr: 13C4-PFOS* | *403.2* | 0 | *384.9* | 0 | *105* | *70-130* | 0 | | | |
| *Surr: 13C2-FtS 4:2* | *425.8* | 0 | *374.9* | 0 | *114* | *50-130* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 6:2* | *380.5* | 0 | *381.9* | 0 | *99.6* | *50-130* | 0 | |
| *Surr: 13C2-FtS 8:2* | *393.1* | 0 | *384.9* | 0 | *102* | *50-130* | 0 | |
| *Surr: 13C8-FOSA* | *424.3* | 0 | *402* | 0 | *106* | *50-130* | 0 | |
| *Surr: d3-N-MeFOSAA* | *535.3* | 0 | *402* | 0 | *133* | *50-130* | 0 | *S* |
| *Surr: d5-N-EtFOSAA* | *558.1* | 0 | *402* | 0 | *139* | *50-130* | 0 | *S* |
| *Surr: 13C3-HFPO-DA* | *338.6* | 0 | *402* | 0 | *84.2* | *50-130* | 0 | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| **MSD** | Sample ID: **21050022-16A MSD** | | | | Units: **ng/Kg** | | Analysis Date: **5/6/2021 06:29 PM** | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | Run ID: **LCMS1_210506B** | | | | SeqNo: **7372309** | | Prep Date: **5/3/2021** | | DF: **1** | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Perfluorobutanoic Acid (PFBA) | 491.1 | 120 | 487.8 | 47.31 | 91 | 50-130 | 498.8 | 1.56 | 30 | |
| Perfluoropentanoic Acid (PFPeA) | 516.4 | 120 | 487.8 | 40.23 | 97.6 | 70-130 | 493.8 | 4.48 | 30 | |
| Perfluorohexanoic Acid (PFHxA) | 492 | 120 | 487.8 | 61.43 | 88.3 | 50-130 | 519.5 | 5.43 | 30 | |
| Perfluoroheptanoic Acid (PFHpA) | 501.1 | 120 | 487.8 | 66.75 | 89.1 | 50-130 | 529.7 | 5.53 | 30 | |
| Perfluorooctanoic Acid (PFOA) | 627 | 24 | 487.8 | 161.1 | 95.5 | 70-130 | 613.9 | 2.1 | 30 | |
| Perfluorononanoic Acid (PFNA) | 559.4 | 24 | 487.8 | 79.78 | 98.3 | 70-130 | 569.2 | 1.75 | 30 | |
| Perfluorodecanoic Acid (PFDA) | 505.1 | 120 | 487.8 | 40.53 | 95.2 | 70-130 | 524.6 | 3.79 | 30 | |
| Perfluoroundecanoic Acid (PFUnA) | 494.9 | 120 | 487.8 | 11.29 | 99.1 | 70-130 | 463.3 | 6.58 | 30 | |
| Perfluorododecanoic Acid (PFDoA) | 541.6 | 120 | 487.8 | 27.38 | 105 | 70-130 | 495.5 | 8.88 | 30 | |
| Perfluorotridecanoic Acid (PFTriA) | 600.8 | 120 | 487.8 | 0 | 123 | 70-130 | 571.4 | 5.02 | 30 | |
| Perfluorotetradecanoic Acid (PFTeA) | 642.5 | 120 | 487.8 | 0.6463 | 132 | 70-130 | 601.7 | 6.56 | 30 | S |
| Perfluorobutanesulfonic Acid (PFBS) | 406.5 | 24 | 431.2 | 23.29 | 88.9 | 70-130 | 416.9 | 2.54 | 30 | |
| Perfluoropentanesulfonic Acid (PFPeS | 420.1 | 24 | 457.6 | 7.695 | 90.1 | 70-130 | 429.6 | 2.25 | 30 | |
| Perfluorohexanesulfonic Acid (PFHxS) | 417 | 120 | 443.9 | 33.6 | 86.4 | 70-130 | 442.5 | 5.92 | 30 | |
| Perfluoroheptanesulfonic Acid (PFHpS | 423.8 | 120 | 464.4 | 10.72 | 89 | 70-130 | 422.1 | 0.416 | 30 | |
| Perfluorooctanesulfonic Acid (PFOS) | 560.7 | 24 | 452.7 | 167.4 | 86.9 | 70-130 | 563.5 | 0.492 | 30 | |
| Perfluorononanesulfonic Acid (PFNS) | 480.3 | 120 | 468.3 | 0 | 103 | 70-130 | 448.7 | 6.79 | 30 | |
| Perfluorodecanesulfonic Acid (PFDS) | 455.3 | 24 | 470.2 | 14.75 | 93.7 | 70-130 | 432.1 | 5.23 | 30 | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | 531.9 | 120 | 455.6 | 3.006 | 116 | 70-130 | 548 | 2.96 | 30 | |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | 537.4 | 120 | 462.4 | 0 | 116 | 70-130 | 528 | 1.78 | 30 | |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | 497.8 | 120 | 467.3 | 0 | 107 | 70-130 | 450.7 | 9.94 | 30 | |
| Perfluorooctanesulfonamide (PFOSA) | 466.3 | 24 | 487.8 | 0 | 95.6 | 70-130 | 471.6 | 1.13 | 30 | |
| N-Ethylperfluorooctanesulfonamidoace | 654.9 | 120 | 487.8 | 0 | 134 | 70-130 | 613 | 6.61 | 30 | S |
| N-Methylperfluorooctanesulfonamidoa | 576.7 | 120 | 487.8 | 0 | 118 | 70-130 | 581.5 | 0.827 | 30 | |
| 11Cl-Pf3OUdS | 403.4 | 24 | 459.5 | 6.341 | 86.4 | 70-130 | 407.3 | 0.959 | 30 | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | 425.6 | 24 | 459.5 | 1.412 | 92.3 | 70-130 | 413.7 | 2.83 | 30 | |
| 9Cl-PF3ONS | 446.9 | 24 | 454.6 | 2.383 | 97.8 | 70-130 | 448.6 | 0.392 | 30 | |
| Hexafluoropropylene oxide dimer acid | 449.1 | 120 | 487.8 | 0 | 92.1 | 50-130 | 395.5 | 12.7 | 30 | |
| *Surr: 13C4-PFBA* | *403.4* | 0 | *390.2* | 0 | *103* | *50-130* | 419.4 | *3.87* | *30* | |
| *Surr: 13C5-PFPeA* | *413.3* | 0 | *390.2* | 0 | *106* | *50-130* | 407.8 | *1.36* | *30* | |
| *Surr: 13C2-PFHxA* | *419.7* | 0 | *390.2* | 0 | *108* | *50-130* | 427.7 | *1.9* | *30* | |
| *Surr: 13C4-PFHpA* | *412.1* | 0 | *390.2* | 0 | *106* | *50-130* | 430.9 | *4.48* | *30* | |
| *Surr: 13C4-PFOA* | *402.9* | 0 | *390.2* | 0 | *103* | *70-130* | 411.9 | *2.2* | *30* | |
| *Surr: 13C5-PFNA* | *419* | 0 | *390.2* | 0 | *107* | *70-130* | 429.9 | *2.56* | *30* | |
| *Surr: 13C2-PFDA* | *416* | 0 | *390.2* | 0 | *107* | *70-130* | 430.3 | *3.39* | *30* | |
| *Surr: 13C2-PFUnA* | *473.5* | 0 | *390.2* | 0 | *121* | *70-130* | 450.1 | *5.07* | *30* | |
| *Surr: 13C2-PFDoA* | *453* | 0 | *390.2* | 0 | *116* | *70-130* | 418.7 | *7.87* | *30* | |
| *Surr: 13C2-PFTeA* | *409.9* | 0 | *390.2* | 0 | *105* | *50-130* | 409.8 | *0.011* | *30* | |
| *Surr: 13C3-PFBS* | *382.2* | 0 | *390.2* | 0 | *98* | *50-130* | 389.4 | *1.87* | *30* | |
| *Surr: 18O2-PFHxS* | *382.1* | 0 | *368.8* | 0 | *104* | *70-130* | 387 | *1.27* | *30* | |
| *Surr: 13C4-PFOS* | *413* | 0 | *373.7* | 0 | *111* | *70-130* | 403.2 | *2.41* | *30* | |
| *Surr: 13C2-FtS 4:2* | *440.3* | 0 | *363.9* | 0 | *121* | *50-130* | 425.8 | *3.34* | *30* | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 6:2* | *392* | 0 | *370.7* | 0 | *106* | *50-130* | 380.5 | *2.98* | *30* | |
| *Surr: 13C2-FtS 8:2* | *417* | 0 | *373.7* | 0 | *112* | *50-130* | 393.1 | *5.89* | *30* | |
| *Surr: 13C8-FOSA* | *412.2* | 0 | *390.2* | 0 | *106* | *50-130* | 424.3 | *2.88* | *30* | |
| *Surr: d3-N-MeFOSAA* | *532* | 0 | *390.2* | 0 | *136* | *50-130* | 535.3 | *0.606* | *30* | *S* |
| *Surr: d5-N-EtFOSAA* | *558.2* | 0 | *390.2* | 0 | *143* | *50-130* | 558.1 | *0.0199* | *30* | *S* |
| *Surr: 13C3-HFPO-DA* | *328.5* | 0 | *390.2* | 0 | *84.2* | *50-130* | 338.6 | *3.04* | *30* | |

**LCS1** Sample ID: **LCS1-176080-176080** Units: **ng/Kg** Analysis Date: **5/6/2021 05:36 PM**

Client ID: Run ID: **LCMS1_210506B** SeqNo: **7372304** Prep Date: **5/3/2021** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Perfluorooctanoic Acid (PFOA) | 37.12 | 25 | 25 | 0 | 148 | 35-150 | 0 | | | |
| Perfluorononanoic Acid (PFNA) | 41.57 | 25 | 25 | 0 | 166 | 35-150 | 0 | | | S |
| Perfluorobutanesulfonic Acid (PFBS) | 28.14 | 25 | 22 | 0 | 128 | 35-150 | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | 34.94 | 25 | 23.5 | 0 | 149 | 35-150 | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | 30.06 | 25 | 23 | 0 | 131 | 35-150 | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | 27.04 | 25 | 24 | 0 | 113 | 35-150 | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | 18.79 | 25 | 25 | 0 | 75.2 | 35-150 | 0 | | | J |
| 11Cl-Pf3OUdS | 25.41 | 25 | 23.5 | 0 | 108 | 35-150 | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | 25.82 | 25 | 23.5 | 0 | 110 | 35-150 | 0 | | | |
| 9Cl-PF3ONS | 22.96 | 25 | 23 | 0 | 99.8 | 35-150 | 0 | | | J |
| *Surr: 13C4-PFBA* | *420.3* | 0 | *400* | 0 | *105* | *50-130* | 0 | | | |
| *Surr: 13C5-PFPeA* | *436.6* | 0 | *400* | 0 | *109* | *50-130* | 0 | | | |
| *Surr: 13C2-PFHxA* | *440.8* | 0 | *400* | 0 | *110* | *50-130* | 0 | | | |
| *Surr: 13C4-PFHpA* | *410.8* | 0 | *400* | 0 | *103* | *50-130* | 0 | | | |
| *Surr: 13C4-PFOA* | *430.7* | 0 | *400* | 0 | *108* | *70-130* | 0 | | | |
| *Surr: 13C5-PFNA* | *425.1* | 0 | *400* | 0 | *106* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDA* | *427.7* | 0 | *400* | 0 | *107* | *70-130* | 0 | | | |
| *Surr: 13C2-PFUnA* | *411.1* | 0 | *400* | 0 | *103* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDoA* | *404.9* | 0 | *400* | 0 | *101* | *70-130* | 0 | | | |
| *Surr: 13C2-PFTeA* | *388.6* | 0 | *400* | 0 | *97.1* | *50-130* | 0 | | | |
| *Surr: 13C3-PFBS* | *392.7* | 0 | *400* | 0 | *98.2* | *50-130* | 0 | | | |
| *Surr: 18O2-PFHxS* | *401.7* | 0 | *378* | 0 | *106* | *70-130* | 0 | | | |
| *Surr: 13C4-PFOS* | *413.7* | 0 | *383* | 0 | *108* | *70-130* | 0 | | | |
| *Surr: 13C2-FtS 4:2* | *351.4* | 0 | *373* | 0 | *94.2* | *50-130* | 0 | | | |
| *Surr: 13C2-FtS 6:2* | *312.4* | 0 | *380* | 0 | *82.2* | *50-130* | 0 | | | |
| *Surr: 13C2-FtS 8:2* | *350.3* | 0 | *383* | 0 | *91.5* | *50-130* | 0 | | | |
| *Surr: 13C8-FOSA* | *425.8* | 0 | *400* | 0 | *106* | *50-130* | 0 | | | |
| *Surr: d3-N-MeFOSAA* | *436.5* | 0 | *400* | 0 | *109* | *50-130* | 0 | | | |
| *Surr: d5-N-EtFOSAA* | *490.7* | 0 | *400* | 0 | *123* | *50-130* | 0 | | | |
| *Surr: 13C3-HFPO-DA* | *409.6* | 0 | *400* | 0 | *102* | *50-130* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| **LCS2** | Sample ID: **LCS2-176080-176080** | | | | Units: **ng/Kg** | | | Analysis Date: **5/6/2021 05:57 PM** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | | Run ID: **LCMS1_210506B** | | | SeqNo: **7372306** | | Prep Date: **5/3/2021** | | DF: **1** | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Perfluorobutanoic Acid (PFBA) | 458.7 | 120 | 500 | 0 | 91.7 | 50-130 | 0 | | | |
| Perfluoropentanoic Acid (PFPeA) | 478.6 | 120 | 500 | 0 | 95.7 | 70-130 | 0 | | | |
| Perfluorohexanoic Acid (PFHxA) | 500.5 | 120 | 500 | 0 | 100 | 50-130 | 0 | | | |
| Perfluoroheptanoic Acid (PFHpA) | 471.6 | 120 | 500 | 0 | 94.3 | 50-130 | 0 | | | |
| Perfluorooctanoic Acid (PFOA) | 480.7 | 25 | 500 | 0 | 96.1 | 70-130 | 0 | | | |
| Perfluorononanoic Acid (PFNA) | 488.1 | 25 | 500 | 0 | 97.6 | 70-130 | 0 | | | |
| Perfluorodecanoic Acid (PFDA) | 465.3 | 120 | 500 | 0 | 93.1 | 70-130 | 0 | | | |
| Perfluoroundecanoic Acid (PFUnA) | 450.8 | 120 | 500 | 0 | 90.2 | 70-130 | 0 | | | |
| Perfluorododecanoic Acid (PFDoA) | 484 | 120 | 500 | 0 | 96.8 | 70-130 | 0 | | | |
| Perfluorotridecanoic Acid (PFTriA) | 579.6 | 120 | 500 | 0 | 116 | 70-130 | 0 | | | |
| Perfluorotetradecanoic Acid (PFTeA) | 646.5 | 120 | 500 | 0 | 129 | 70-130 | 0 | | | |
| Perfluorobutanesulfonic Acid (PFBS) | 405.9 | 25 | 442 | 0 | 91.8 | 70-130 | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | 440.8 | 25 | 469 | 0 | 94 | 70-130 | 0 | | | |
| Perfluorohexanesulfonic Acid (PFHxS) | 452.2 | 120 | 455 | 0 | 99.4 | 70-130 | 0 | | | |
| Perfluoroheptanesulfonic Acid (PFHpS | 460.4 | 120 | 476 | 0 | 96.7 | 70-130 | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | 441.1 | 25 | 464 | 0 | 95.1 | 70-130 | 0 | | | |
| Perfluorononanesulfonic Acid (PFNS) | 417.3 | 120 | 480 | 0 | 86.9 | 70-130 | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | 458.5 | 25 | 482 | 0 | 95.1 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | 496.4 | 120 | 467 | 0 | 106 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | 469.8 | 120 | 474 | 0 | 99.1 | 70-130 | 0 | | | |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | 568.1 | 120 | 479 | 0 | 119 | 70-130 | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | 468.2 | 25 | 500 | 0 | 93.6 | 70-130 | 0 | | | |
| N-Ethylperfluorooctanesulfonamidoace | 558.6 | 120 | 500 | 0 | 112 | 70-130 | 0 | | | |
| N-Methylperfluorooctanesulfonamidoa | 546.8 | 120 | 500 | 0 | 109 | 70-130 | 0 | | | |
| 11Cl-Pf3OUdS | 423.7 | 25 | 471 | 0 | 90 | 70-130 | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | 425.7 | 25 | 471 | 0 | 90.4 | 70-130 | 0 | | | |
| 9Cl-PF3ONS | 446.5 | 25 | 466 | 0 | 95.8 | 70-130 | 0 | | | |
| Hexafluoropropylene oxide dimer acid | 403.5 | 120 | 500 | 0 | 80.7 | 50-130 | 0 | | | |
| *Surr: 13C4-PFBA* | *427.5* | 0 | *400* | 0 | *107* | *50-130* | 0 | | | |
| *Surr: 13C5-PFPeA* | *426.1* | 0 | *400* | 0 | *107* | *50-130* | 0 | | | |
| *Surr: 13C2-PFHxA* | *421.7* | 0 | *400* | 0 | *105* | *50-130* | 0 | | | |
| *Surr: 13C4-PFHpA* | *415.2* | 0 | *400* | 0 | *104* | *50-130* | 0 | | | |
| *Surr: 13C4-PFOA* | *432.1* | 0 | *400* | 0 | *108* | *70-130* | 0 | | | |
| *Surr: 13C5-PFNA* | *436.9* | 0 | *400* | 0 | *109* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDA* | *419.6* | 0 | *400* | 0 | *105* | *70-130* | 0 | | | |
| *Surr: 13C2-PFUnA* | *447.2* | 0 | *400* | 0 | *112* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDoA* | *442.9* | 0 | *400* | 0 | *111* | *70-130* | 0 | | | |
| *Surr: 13C2-PFTeA* | *430.4* | 0 | *400* | 0 | *108* | *50-130* | 0 | | | |
| *Surr: 13C3-PFBS* | *409.4* | 0 | *400* | 0 | *102* | *50-130* | 0 | | | |
| *Surr: 18O2-PFHxS* | *404.2* | 0 | *378* | 0 | *107* | *70-130* | 0 | | | |
| *Surr: 13C4-PFOS* | *415.6* | 0 | *383* | 0 | *109* | *70-130* | 0 | | | |
| *Surr: 13C2-FtS 4:2* | *405.6* | 0 | *373* | 0 | *109* | *50-130* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 6:2* | *347.6* | 0 | *380* | 0 | *91.5* | *50-130* | 0 | |
| *Surr: 13C2-FtS 8:2* | *402.9* | 0 | *383* | 0 | *105* | *50-130* | 0 | |
| *Surr: 13C8-FOSA* | *427.5* | 0 | *400* | 0 | *107* | *50-130* | 0 | |
| *Surr: d3-N-MeFOSAA* | *471.4* | 0 | *400* | 0 | *118* | *50-130* | 0 | |
| *Surr: d5-N-EtFOSAA* | *520.6* | 0 | *400* | 0 | *130* | *50-130* | 0 | *S* |
| *Surr: 13C3-HFPO-DA* | *352.8* | 0 | *400* | 0 | *88.2* | *50-130* | 0 | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| **LCS3** | Sample ID: **LCS3-176080-176080** | | | | Units: **ng/Kg** | | | Analysis Date: **5/6/2021 05:47 PM** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | | Run ID: **LCMS1_210506B** | | | SeqNo: **7372305** | | | Prep Date: **5/3/2021** | | DF: **1** | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Perfluorobutanoic Acid (PFBA) | 124 | 120 | 125 | 0 | 99.2 | 35-150 | 0 | | | |
| Perfluoropentanoic Acid (PFPeA) | 114.5 | 120 | 125 | 0 | 91.6 | 35-150 | 0 | | | J |
| Perfluorohexanoic Acid (PFHxA) | 138.6 | 120 | 125 | 0 | 111 | 35-150 | 0 | | | |
| Perfluoroheptanoic Acid (PFHpA) | 125.2 | 120 | 125 | 0 | 100 | 35-150 | 0 | | | |
| Perfluorooctanoic Acid (PFOA) | 117.6 | 25 | 125 | 0 | 94.1 | 35-150 | 0 | | | |
| Perfluorononanoic Acid (PFNA) | 136.8 | 25 | 125 | 0 | 109 | 35-150 | 0 | | | |
| Perfluorodecanoic Acid (PFDA) | 135.5 | 120 | 125 | 0 | 108 | 35-150 | 0 | | | |
| Perfluoroundecanoic Acid (PFUnA) | 123.1 | 120 | 125 | 0 | 98.5 | 35-150 | 0 | | | |
| Perfluorododecanoic Acid (PFDoA) | 146.3 | 120 | 125 | 0 | 117 | 35-150 | 0 | | | |
| Perfluorotridecanoic Acid (PFTriA) | 152.9 | 120 | 125 | 0 | 122 | 35-150 | 0 | | | |
| Perfluorotetradecanoic Acid (PFTeA) | 159 | 120 | 125 | 0 | 127 | 35-150 | 0 | | | |
| Perfluorobutanesulfonic Acid (PFBS) | 107.9 | 25 | 110 | 0 | 98.1 | 35-150 | 0 | | | |
| Perfluoropentanesulfonic Acid (PFPeS | 111.3 | 25 | 118 | 0 | 94.3 | 35-150 | 0 | | | |
| Perfluorohexanesulfonic Acid (PFHxS) | 126.9 | 120 | 115 | 0 | 110 | 35-150 | 0 | | | |
| Perfluoroheptanesulfonic Acid (PFHpS | 125.6 | 120 | 120 | 0 | 105 | 35-150 | 0 | | | |
| Perfluorooctanesulfonic Acid (PFOS) | 112.6 | 25 | 115 | 0 | 98 | 35-150 | 0 | | | |
| Perfluorononanesulfonic Acid (PFNS) | 132.5 | 120 | 120 | 0 | 110 | 35-150 | 0 | | | |
| Perfluorodecanesulfonic Acid (PFDS) | 129.5 | 25 | 120 | 0 | 108 | 35-150 | 0 | | | |
| Fluorotelomer Sulphonic Acid 4:2 (FtS | 118.3 | 120 | 118 | 0 | 100 | 35-150 | 0 | | | J |
| Fluorotelomer Sulphonic Acid 6:2 (FtS | 107 | 120 | 118 | 0 | 90.6 | 35-150 | 0 | | | J |
| Fluorotelomer Sulphonic Acid 8:2 (FtS | 128.1 | 120 | 120 | 0 | 107 | 35-150 | 0 | | | |
| Perfluorooctanesulfonamide (PFOSA) | 124.7 | 25 | 125 | 0 | 99.7 | 35-150 | 0 | | | |
| N-Ethylperfluorooctanesulfonamidoace | 160.6 | 120 | 125 | 0 | 129 | 35-150 | 0 | | | |
| N-Methylperfluorooctanesulfonamidoa | 134.9 | 120 | 125 | 0 | 108 | 35-150 | 0 | | | |
| 11Cl-Pf3OUdS | 114.1 | 25 | 118 | 0 | 96.7 | 35-150 | 0 | | | |
| 4,8-Dioxa-3H-perfluorononanoic Acid ( | 109.4 | 25 | 118 | 0 | 92.7 | 35-150 | 0 | | | |
| 9Cl-PF3ONS | 106.4 | 25 | 118 | 0 | 90.2 | 35-150 | 0 | | | |
| Hexafluoropropylene oxide dimer acid | 139.5 | 120 | 125 | 0 | 112 | 35-150 | 0 | | | |
| *Surr: 13C4-PFBA* | *417.7* | 0 | *400* | 0 | *104* | *50-130* | 0 | | | |
| *Surr: 13C5-PFPeA* | *418.1* | 0 | *400* | 0 | *105* | *50-130* | 0 | | | |
| *Surr: 13C2-PFHxA* | *436.4* | 0 | *400* | 0 | *109* | *50-130* | 0 | | | |
| *Surr: 13C4-PFHpA* | *405.7* | 0 | *400* | 0 | *101* | *50-130* | 0 | | | |
| *Surr: 13C4-PFOA* | *439.1* | 0 | *400* | 0 | *110* | *70-130* | 0 | | | |
| *Surr: 13C5-PFNA* | *430* | 0 | *400* | 0 | *107* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDA* | *419.3* | 0 | *400* | 0 | *105* | *70-130* | 0 | | | |
| *Surr: 13C2-PFUnA* | *441.5* | 0 | *400* | 0 | *110* | *70-130* | 0 | | | |
| *Surr: 13C2-PFDoA* | *437.1* | 0 | *400* | 0 | *109* | *70-130* | 0 | | | |
| *Surr: 13C2-PFTeA* | *416.1* | 0 | *400* | 0 | *104* | *50-130* | 0 | | | |
| *Surr: 13C3-PFBS* | *390.3* | 0 | *400* | 0 | *97.6* | *50-130* | 0 | | | |
| *Surr: 18O2-PFHxS* | *391.9* | 0 | *378* | 0 | *104* | *70-130* | 0 | | | |
| *Surr: 13C4-PFOS* | *393.6* | 0 | *383* | 0 | *103* | *70-130* | 0 | | | |
| *Surr: 13C2-FtS 4:2* | *350.7* | 0 | *373* | 0 | *94* | *50-130* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **176080** Instrument ID **LCMS1** Method: **D7968-17a**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Surr: 13C2-FtS 6:2* | *312.8* | 0 | *380* | 0 | *82.3* | *50-130* | 0 |
| *Surr: 13C2-FtS 8:2* | *323.4* | 0 | *383* | 0 | *84.4* | *50-130* | 0 |
| *Surr: 13C8-FOSA* | *434.6* | 0 | *400* | 0 | *109* | *50-130* | 0 |
| *Surr: d3-N-MeFOSAA* | *451.8* | 0 | *400* | 0 | *113* | *50-130* | 0 |
| *Surr: d5-N-EtFOSAA* | *481.4* | 0 | *400* | 0 | *120* | *50-130* | 0 |
| *Surr: 13C3-HFPO-DA* | *350* | 0 | *400* | 0 | *87.5* | *50-130* | 0 |

**The following samples were analyzed in this batch:** 21042488-01A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Ottawa County Road Commission
**Work Order:** 21042488
**Project:** West Central Ottawa WWTP

# QC BATCH REPORT

Batch ID: **R315584** Instrument ID **MOIST** Method: **SW3550C**

**MBLK** Sample ID: **WBLKS-R315584** Units: **% of sample** Analysis Date: **5/4/2021 03:09 PM**
Client ID: Run ID: **MOIST_210504A** SeqNo: **7364983** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | U | 0.10 | | | | | | | | |

**LCS** Sample ID: **LCS-R315584** Units: **% of sample** Analysis Date: **5/4/2021 03:09 PM**
Client ID: Run ID: **MOIST_210504A** SeqNo: **7364982** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 100 | 0.10 | 100 | 0 | 100 | 98-102 | 0 | | | |

**DUP** Sample ID: **21042098-09B DUP** Units: **% of sample** Analysis Date: **5/4/2021 03:09 PM**
Client ID: Run ID: **MOIST_210504A** SeqNo: **7364966** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 19.33 | 0.10 | 0 | 0 | 0 | 0-0 | 19.12 | 1.09 | 10 | |

**DUP** Sample ID: **21050132-01A DUP** Units: **% of sample** Analysis Date: **5/4/2021 03:09 PM**
Client ID: Run ID: **MOIST_210504A** SeqNo: **7364981** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 97.45 | 0.10 | 0 | 0 | 0 | 0-0 | 97.64 | 0.195 | 10 | |

**The following samples were analyzed in this batch:** 21042488-01A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

# Chain of Custody Form

Page _____ of _____

COC ID: 052493

ALS Project Manager: | ALS Work Order #: 21042488

| Customer Information | | Project Information | | Parameter/Method Request for Analysis | |
|---|---|---|---|---|---|
| Purchase Order | | Project Name | WCO WWTP | A | Biosolids PFAS |
| Work Order | | Project Number | | B | |
| Company Name | Ottawa County Road Commission | Bill To Company | | C | |
| Send Report To | Joe Hebert | Invoice Attn | | D | |
| Address | 14110 Lakeshore Dr. | Address | | E | |
| | | | | F | |
| City/State/Zip | Grand Haven MI 49417 | City/State/Zip | | G | |
| Phone | 616-638-0382 | Phone | | H | |
| Fax | | Fax | | I | |
| e-Mail Address | JHebert@ottawacorc.com | e-Mail Address | | J | |

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S-2 West Sludge tank | 4/28/2021 | 12:30 PM | SL | N/A | 3 | X | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Sampler(s) Please Print & Sign: Joe Hebert

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

| | | | | |
|---|---|---|---|---|
| Relinquished by: | Date: 4/28/21 | Time: 1:00 PM | Received by: | Notes: |
| Relinquished by: | Date: 4/28/21 | Time: 1300 | Received by (Laboratory): | |
| Logged by (Laboratory): KR | Date: 4/28/21 | Time: 1325 | Checked by (Laboratory): | |

| Cooler ID | Cooler Temp. |
|---|---|
| 183 | 4.9°C |
| | |
| | |

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other _____

Preservative Key: 1-HCl 2-$HNO_3$ 3-$H_2SO_4$ 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

## Sample Receipt Checklist

Client Name: **OCRC** Date/Time Received: **28-Apr-21 13:00**

Work Order: **21042488** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 28-Apr-21 (Date) Reviewed by: Bill Carey (eSignature) 29-Apr-21 (Date)

Matrices: Sludge
Carrier name: Client

| | | | |
|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | Yes ☐ | No ☐ | Not Present ☑ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| Chain of custody present? | Yes ☑ | No ☐ | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | |
| Sample containers intact? | Yes ☑ | No ☐ | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | |
| All samples received within holding time? | Yes ☑ | No ☐ | |
| Container/Temp Blank temperature in compliance? | Yes ☑ | No ☐ | |
| Sample(s) received on ice? | Yes ☑ | No ☐ | |
| Temperature(s)/Thermometer(s): | 4.8/5.8 C | IR3 | |
| Cooler(s)/Kit(s): | | | |
| Date/Time sample(s) sent to storage: | 4/28/2021 1:24:11 PM | | |
| Water - VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA vials submitted ☑ |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☑ |
| pH adjusted? | Yes ☐ | No ☐ | N/A ☑ |
| pH adjusted by: | - | | |

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: