Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

August 30, 2021

CH2M/Jacobs
606 Hannah Ave.
Traverse City, MI 49686

RE: GTSF

Order No.: 2108752

Dear Mr. Justin Straub:

Guide to reading Lab Result

Prein&Newhof Laboratory received 1 sample(s) on 8/13/2021 on your behalf. Your test results are provided in your Prein&Newhof Laboratory analytical report. Please carefully review your analytical report, noting the following.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Any analyte that exceeds the client provided permit level are noted on the report with an "*" in the Qual field. Quality control data is within laboratory defined or method specified acceptance limits except if noted.

When testing for PFHxS, PFOA, PFOS, MeFOSAA, and EtFOSAA results include both branched and linear isotopes. We extract a Method Blank and analyze it with the preparation batch. Method Blank analytes are within the Reporting Limit (RL).

To learn more about interpreting your Lab Report, follow the link above to view our "Guide to Reading Lab Results". If you have any concerns about your test results or need additional help, please call: 616-364-7600 or email me: sbylsma@preinnewhof.com.

We use EPA Approved Methods for all regulated parameters. EPA Lab #: MI000014

Thank you for your business.
Sincerely,

Steve Bylsma
Laboratory Manager

**CC:**
Mr. Alex Arnold
Mr. Joshua Lycka
Mr. Mark Huggard
Ms. Elizabeth Hart

Original Page 1 of 2

**CLIENT:** CH2M/Jacobs **Lab Order:** 2108752
**Project:** GTSF

**Lab ID:** 2108752-01 **Matrix:** BIOSOLIDS **Collection Date:** 8/12/2021 10:30:00 AM
**Client ID:** GTSF0812211030-Bio **Sampler:** Josh **Received Date:** 8/13/2021 10:30:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|

**Qualifiers:**

| | |
|---|---|
| < | Not Detected at the Reporting Limit |
| MCL | Maximum Contaminant Level |
| RL | Reporting Limit |
| H | Holding times for preparation or analysis exceeded |
| PL | Permit Limit |



3260 Evergreen Drive, NE Grand Rapids, MI 49525 t.616-364-7600 f. 616-364-4222 www.preinnewhof.com

# Analytical Laboratory Report

Report ID: S27264.01(01)
Generated on 08/30/2021

Report to

Attention: Stephen Bylsma
Prein & Newhof
3260 Evergreen Drive NE
Grand Rapids, MI 49525

Phone: 616-364-7600 FAX:
Email: SBylsma@preinnewhof.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 Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S27264.01
Project: Monitoring
Collected Date(s): 08/12/2021
Submitted Date/Time: 08/17/2021 12:50
Sampled by: Unknown
P.O. #:

Table of Contents



Maya Murshak
Technical Director

## 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.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

## Report Narrative

There is no additional narrative for this analytical 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 |
| Pennsylvania DEP | #68-05884 |

**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 |

**Method Summary**

| Method | Version |
|---|---|
| ASTM D7968-17M | ASTM Method D7968 - 17 Modified (Isotopic Dilution) |
| SM2540B | Standard Method 2540 B 2011 |

**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 | 68259-12-1 |
| PFDoDA | Perfluorododecanoic Acid | 307-55-1 |
| PFDS | Perfluorodecane Sulfonic Acid | 335-77-3 |
| PFTrDA | Perfluorotridecanoic Acid | 72629-94-8 |
| FOSA | Perfluorooctane Sulfonamide | 754-91-6 |
| PFTeDA | Perfluorotetradecanoic Acid | 376-06-7 |
| 11Cl-PF3OUdS | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid | 763051-92-9 |
| 9Cl-PF3ONS | 9-chlorohexadecafluoro-3-oxanone1-sulfonic acid | 756426-58-1 |
| ADONA | 4,8-dioxa-3H-perfluorononanoic acid | 919005-14-4 |
| HFPO-DA | Hexafluoropropylene oxide dimer | 13252-13-6 |

# Analytical Laboratory Report

**Sample Summary (1 samples)**

| Sample ID | Sample Tag | Matrix | Collected Date/Time |
|---|---|---|---|
| S27264.01 | 2108752-01A | Biosolids | 08/12/21 10:30 |

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S27264.01**
Sample Tag: 2108752-01A
Collected Date/Time: 08/12/2021 10:30
Matrix: Biosolids
COC Reference: 738

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 15ml Centrifuge Tube | None | Yes | 5.7 | IR |
| 1 | 250ml Plastic | None | Yes | 5.7 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Initial wt. (g) / Final wt. (g) / Volume (ml)* | 9.03/7.08/10 | ASTM D7968-17M | 08/25/21 15:45 | KCV | |

***Inorganics***

**Method: SM2540B, Run Date: 08/17/21 16:40, Analyst: ELR**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Total Solids* | 4.1 | 1 | | % | 1 | | |

***Organics***

**28 PFAs, Method: ASTM D7968-17M, Run Date: 08/28/21 06:12, Analyst: KCV**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| PFBA* | Not detected | 54 | | ug/kg | 125 | 375-22-4 | IX |
| PFPeA* | 15 | 1.3 | | ug/kg | 125 | 2706-90-3 | I |
| 4:2 FTSA* | Not detected | 1.3 | | ug/kg | 125 | 757124-72-4 | I |
| PFHxA* | 62 | 1.3 | | ug/kg | 125 | 307-24-4 | |
| PFBS* | 10 | 1.3 | | ug/kg | 125 | 375-73-5 | |
| PFHpA* | 14 | 1.3 | | ug/kg | 125 | 375-85-9 | |
| PFPeS* | Not detected | 1.3 | | ug/kg | 125 | 2706-91-4 | |
| 6:2 FTSA* | 3.1 | 1.3 | | ug/kg | 125 | 27619-97-2 | I |
| PFOA* | 82 | 1.3 | | ug/kg | 125 | 335-67-1 | |
| PFHxS* | 7.9 | 1.3 | | ug/kg | 125 | 355-46-4 | |
| PFHxS-LN* | 6.7 | 1.3 | | ug/kg | 125 | 355-46-4-LN | |
| PFHxS-BR* | Not detected | 1.3 | | ug/kg | 125 | 355-46-4-BR | |
| PFNA* | 11 | 1.3 | | ug/kg | 125 | 375-95-1 | |
| 8:2 FTSA* | 30 | 1.3 | | ug/kg | 125 | 39108-34-4 | I |
| PFHpS* | Not detected | 1.3 | | ug/kg | 125 | 375-92-8 | |
| PFDA* | 60 | 1.3 | | ug/kg | 125 | 335-76-2 | I |
| N-MeFOSAA* | 190 | 1.3 | | ug/kg | 125 | 2355-31-9 | |
| EtFOSAA* | 51 | 1.3 | | ug/kg | 125 | 2991-50-6 | |
| PFOS* | 97 | 1.3 | | ug/kg | 125 | 1763-23-1 | I |
| PFOS-LN* | 75 | 1.3 | | ug/kg | 125 | 1763-23-1-LN | I |
| PFOS-BR* | 22 | 1.3 | | ug/kg | 125 | 1763-23-1-BR | I |
| PFUnDA* | 6.3 | 1.3 | | ug/kg | 125 | 2058-94-8 | I |
| PFNS* | Not detected | 1.3 | | ug/kg | 125 | 68259-12-1 | I |
| PFDoDA* | 16 | 1.3 | | ug/kg | 125 | 307-55-1 | I |
| PFDS* | 1.7 | 1.3 | | ug/kg | 125 | 335-77-3 | I |
| PFTrDA* | Not detected | 1.3 | | ug/kg | 125 | 72629-94-8 | I |
| FOSA* | 12 | 1.3 | | ug/kg | 125 | 754-91-6 | |
| PFTeDA* | 7.2 | 1.3 | | ug/kg | 125 | 376-06-7 | I1 |
| 11Cl-PF3OUdS* | Not detected | 1.3 | | ug/kg | 125 | 763051-92-9 | I |

I-Matrix interference with internal standard X-Elevated reporting limit due to matrix interference
1-IS recovery <10%

**Lab Sample ID: S27264.01 (continued)**

Sample Tag: 2108752-01A

**28 PFAs, Method: ASTM D7968-17M, Run Date: 08/28/21 06:12, Analyst: KCV (continued)**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| 9Cl-PF3ONS* | Not detected | 1.3 | | ug/kg | 125 | 756426-58-1 | I |
| ADONA* | Not detected | 1.3 | | ug/kg | 125 | 919005-14-4 | |
| HFPO-DA* | Not detected | 1.3 | | ug/kg | 125 | 13252-13-6 | I |

I-Matrix interference with internal standard

# Merit Laboratories Login Checklist

Lab Set ID: S27264
Client: PREINNEWHOF (Prein & Newhof)
Project: Monitoring
Submitted: 08/17/2021 12:50 Login User: SRS

Attention: Stephen Bylsma
Address: Prein & Newhof
3260 Evergreen Drive NE
Grand Rapids, MI 49525

Phone: 616-364-7600 FAX:
Email: SBylsma@preinnewhof.com

| Selection | | | | Description | Note |
|---|---|---|---|---|---|
| **Sample Receiving** | | | | | |
| 01. | [X] Yes | [ ] No | [ ] N/A | Samples are received at 4C +/- 2C Thermometer # | IR 5.7 |
| 02. | [X] Yes | [ ] No | [ ] N/A | Received on ice/ cooling process begun | |
| 03. | [X] Yes | [ ] No | [ ] N/A | Samples shipped | UPS |
| 04. | [ ] Yes | [X] No | [ ] N/A | Samples left in 24 hr. drop box | |
| 05. | [X] Yes | [ ] No | [ ] N/A | Are there custody seals/tape or is the drop box locked | |
| **Chain of Custody** | | | | | |
| 06. | [X] Yes | [ ] No | [ ] N/A | COC adequately filled out | |
| 07. | [ ] Yes | [X] No | [ ] N/A | COC signed and relinquished to the lab | |
| 08. | [X] Yes | [ ] No | [ ] N/A | Sample tag on bottles match COC | |
| 09. | [ ] Yes | [X] No | [ ] N/A | Subcontracting needed? Subcontacted to: | |
| **Preservation** | | | | | |
| 10. | [ ] Yes | [ ] No | [X] N/A | Do sample have correct chemical preservation | |
| 11. | [ ] Yes | [ ] No | [X] N/A | Completed pH checks on preserved samples? (no VOAs) | |
| 12. | [ ] Yes | [X] No | [ ] N/A | Did any samples need to be preserved in the lab? | |
| **Bottle Conditions** | | | | | |
| 13. | [X] Yes | [ ] No | [ ] N/A | All bottles intact | |
| 14. | [X] Yes | [ ] No | [ ] N/A | Appropriate analytical bottles are used | |
| 15. | [X] Yes | [ ] No | [ ] N/A | Merit bottles used | |
| 16. | [X] Yes | [ ] No | [ ] N/A | Sufficient sample volume received | |
| 17. | [ ] Yes | [X] No | [ ] N/A | Samples require laboratory filtration | |
| 18. | [X] Yes | [ ] No | [ ] N/A | Samples submitted within holding time | |
| 19. | [ ] Yes | [ ] No | [X] 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: _____

Prein&Newhof
Engineers • Surveyors • Environmental • Laboratory

# CHAIN OF CUSTODY RECORD

| Omega COCID 738 | PAGE: 1 | OF: 1 |
|---|---|---|


**ADDRESS**
*Prein&Newhof Laboratory*
*3260 Evergreen Dr NE*
*Grand Rapids, MI 49525*
*TEL: (616) 364-7600*
*FAX: (616) 364-4222*
*Website: www.preinnewhof.com*


sbylsma@preinnewhof.com

SUB CONTRATOR: **Merrit Labs** COMPANY:
ADDRESS:
CITY, STATE, ZIP:
PHONE: FAX: EMAIL:
ACCOUNT #:

SPECIAL INSTRUCTIONS / COMMENTS:

| ITEM # | SAMPLE ID | Client Sample ID | Bottle Type | MATRIX | DATE COLLECTED | NUMBER OF CONTAINERS | ANALYTICAL PARAMETERS: PFAS-SUB | COMMENTS (Methanol Preserved Weights, HOT Sample Notation, Additional Sample Description, etc.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2108752-01A | GTSF0812211030-Bi | | Biosolids | 8/12/2021 10:30:00 AM | 1 | √ | |

27204.01

| Relinquished By: | Date: | Time: | Received By: | Date: | Time: |
|---|---|---|---|---|---|
| Relinquished By: UPS | Date: 8/17/21 | Time: 1250 | Received By: | Date: 8/17/21 | Time: 1250 |
| Relinquished By: | Date: | Time: | Received By: | Date: | Time: |

**TAT:** Standard ☐ **RUSH** Next BD ☐ 2nd BD ☐ 3rd BD ☐

**Note: RUSH requests will incur surcharges!**

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples 5.7 °C Attempt to Cool ?
Comments:

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

3260 Evergreen Drive, NE
Grand Rapids, MI 49525
t. 616-364-7600
f. 616-364-4222

Client: Jacobs
Billing Address: 606 Hannah Ave, Traverse City
Phone Number:
Project Name: GTSF
Project Number:
Email Results To: Joshua Lycka
Sampling Personnel: " "

Wastewater W
Drinking Water D
Groundwater G
Soil S
Sludge L
Other X

# CHAIN OF CUSTODY

No. 44879

| LAB USE | Sample Information | | | MATRIX | Preservative | | | | | | Analysis Requested | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample ID # | Date Collected | Time Collected | Sample Description and Location (e.g. MW-1) | | None | H2SO4 | HNO3 | HCL | NaOH | Other | PFAS by Biosolids | TS | | | | | | | | | | | | | | | | | | | | | | | |
| 8752-1 | 8/12/21 | 10:30a | GTSF081221 1030 - Biosolids | | | | | | | | X | X | | | | | | | | | | | | | | | | | | | | | | | |
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Comments:

| | | | | | |
|---|---|---|---|---|---|
| Relinquished By: (Signature) | Date 8/12/21 | Time 10:45a | Received By: (Signature) | Date | Time |
| Relinquished By: (Signature) | Date | Time | Received By: (Signature) | Date | Time |
| Received for Laboratory By: | Date 8/13/21 | Time 1030 | Data Package Relinquished By: | Date | Time |