GANNETT FLEMING

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March 11, 2025
File # 55929.007

Mr. Matthew Vitale
Bureau of Remediation and Redevelopment
Wisconsin Department of Natural Resources, WCR
1300 West Clairemont Avenue
Eau Claire, WI 54702-4001

Re: **Request for Technical Review**
Work Plan for Proposed Sampling & Analytical Methods
WRR Environmental Services Co., Inc.
WDNR BRRTS No. 02-18-587957
WDNR FID No. 618 026 530
EPA ID No. WID 990 829 475

Dear Matthew:

On behalf of WRR Environmental Services Co. Inc. (WRR), Gannett Fleming, Inc. (GF) prepared this work plan for proposed sampling and analytical methods to be used during the investigation and monitoring of per- and poly-fluoroalkyl substances (PFAS) impacts at the WRR facility in Eau Claire. The work plan includes:

- The proposed installation and use of HydraSleeves™ to collect groundwater samples from monitoring wells and piezometers.
- The proposed methods for PFAS analysis to be used for:
    - Screening samples collected during site investigation activities to determine areas were elevated PFAS concentrations are present in soil and groundwater.
    - Routine groundwater samples collected from monitoring wells and piezometers.
    - Compliance samples used to measure PFAS concentrations in discharge from WRR's groundwater treatment system, investigation samples and monitoring wells/piezometers that will be used to document areas with no/low PFAS concentrations in the soil and groundwater, all samples that will be used for documenting site conditions at site regulatory closure, and private drinking water wells.

This work plan follows GF's January 2025 *PFAS Investigation & Monitoring Report*. Included with this work plan is Wisconsin Department of Natural Resources' (WDNR) Form 4400-237 and a check for $700 for the WDNR to conduct its technical review of the work plan, per NR 749. The work plan also includes a signed copy of the engineer and hydrogeologist certification form, as required by NR 712.07(1) of the Wis. Adm. Code.

Proposed Alternative Groundwater Sampling Method

GF proposes to use EON Products' HydraSleeves for the collection of groundwater samples from monitoring wells/piezometers during routine sampling events. Currently, groundwater samples are being collected from monitoring wells and piezometers at the site for PFAS analysis by purging each well/piezometer of four well volumes

monitoring wells and piezometers at the site for PFAS analysis by purging each well/piezometer of four well volumes and then either using a bailer to collect a groundwater sample at the air-water interface in wells screened at the water table or by low-flow pumping from the screened interval of piezometers. The HydraSleeves are passive samplers that do not require purging the well/piezometer and therefore limit cross-contamination of samples in wells/piezometers where pumps are used to purge or collect the samples.

The HydraSleeves are made of clear high-density polyethylene (HDPE) designed to collect samples for PFAS, volatile organic compounds (VOCs), and other parameters. The HydraSleeve would be fixed to polypropylene suspension tethers with weights to bring them to the bottom of the proposed sampling interval, which would be the middle of the saturated screened interval of each well/piezometer. The HydraSleeves are designed to close after the sample is collected and the sleeve is full so that the sample does not contact other water in the well. Information pertaining to the design, deployment, and use of HydraSleeves and a PFAS bench scale case study is included with the work plan as Attachment A. Based on EON's January 2024 *Assessing HydraSleeve Samplers for Acquiring Representative PFAS Concentrations in Aqueous Environments* paper in Attachment A:

- Over 1 million samples have been collected using HydraSleeves to comply with groundwater monitoring and remediation requirements since 2000, including sites in Wisconsin that GF work on with WDNR oversight.
- Since 2016, approximately 60,000 HDPE HydraSleeves have been used to collect groundwater samples for PFAS analysis.

If approved for use at the WRR site, the HydraSleeves would be installed in all monitoring wells and piezometers used for routine groundwater sampling. Attachment B includes excerpts from GF's January 2025 *PFAS Investigation & Monitoring Report* showing well locations and summarizing PFAS concentrations previously measured in the site monitoring wells/piezometers. New HydraSleeves would be placed in each sampled well/piezometer after each monitoring event to use for the collection of samples during the next sampling event.

The HydraSleeves would also be used for collection of samples for analysis of VOCs, 1,4-dioxane, and other natural attenuation parameters (dissolved iron and manganese, nitrates, sulfate, alkalinity, and total organic carbon) in select wells/piezometers where reducing reagents have previously been injected to facilitate microbial degradation of chlorinated VOCs. See Appendix D in GF's February 2025 *Operations & Maintenance/Corrective Action Report – December 2023 through November 2024* (BRRTS# 02-18-000274) for VOC and other parameter concentrations measured in the site monitoring wells and piezometers through October 2024.

Current & Proposed PFAS Regulatory Standards & Criteria

As of the date of this work plan, the following regulations pertaining to PFAS have been promulgated:

- In August 2022, Wisconsin's safe drinking water code (NR 809 WAC) was revised to include maximum contaminant levels (MCLs) of 70 nanograms per liter (ng/ℓ) for PFOS and PFAS – either individually or combined.

- In February 2022, Wisconsin's Natural Resources Board approved and in August 2022, the legislature passed, and the governor signed the following surface water quality criteria (SWQC) as NR 102.04(8)(d) WAC:
    - The SWQC for PFOA in surface waters that supply public drinking water is 20 ng/ℓ.
    - The SWQC for PFOA in surface waters that do not supply public drinking water is 95 ng/ℓ.
    - The SWQC for PFOS in all surface waters is 8 ng/ℓ.

- In April 2024, the USEPA established the following maximum contaminant levels (MCLs) for PFAS compounds pertaining to public water systems:

- PFNA, PFHxS, and HFPO-DA (Gen X), each individually at 10 ng/ℓ (ppt).
- Mixtures of two or more compounds - PFHxS, PFNA, HFPO-DA (Gen X) & PFBS - with a combined Hazard Index (HI) of 1. The HI is the sum of the ratios of each of these four compounds to their individual MCL.
- For purposes of calculating the HI, the USEPA used a Health Based Water Concentration (HBWC) for PFBS of 2,000 ng/ℓ (ppt).

The Wisconsin Department of Health Services (WDHS) sent a letter to the WDNR on January 30, 2025, (that was revised on February 7, 2025) with a summary of the Cycle 12 Recommendations for NR 140 enforcement standards (ES) and preventative action limits (PALs) for the six PFAS compounds listed above. The WDHS' proposed NR 140 ESs for PFOS, PFOA, PFNA, PFHxS, and HFPO-DA (Gen X) are equivalent to their USEPA's MCLs and the proposed NR 140 ES for PFBS is equivalent to the USEPA's HBWC. The proposed NR 140 ESs and PALs for these six compounds have not been promulgated by the legislature.

The WDNR sent a notification regarding the use of EPA Method 1633A by/after February 1, 2025, for all non-drinking water matrices when the samples are used for compliance with applicable guidelines, regulations, criteria, or permit limits. However, based on GF's correspondence with the WDNR, there is some flexibility in PFAS analytical methods if the samples are not used for compliance purposes.

Proposed PFAS Analytical Methods Usage

GF proposes to use the following laboratory methods for PFAS analysis for various sample matrices & sources:

- Soil and groundwater samples collected from borings and temporary wells during site investigation activities would be screened in the laboratory using EPA 8327. The screening sample results would primarily be used to determine areas where no/low or elevated PFAS are present in the soil and groundwater. PFAS concentrations measured in the screened samples would be used to determine if additional samples would be submitted from that boring, sample interval, or temporary well for screening using the Method 8327 or for additional analysis using other methods discussed below.

- Duplicate samples collected during site investigation activities would be submitted for additional analysis using either Method 537M or 1633A, dependent on whether elevated or low/no PFAS concentrations were measured in the corresponding screened sample, respectively. Properties of each analytical method are compared below.

    - For soil samples, Method 8327 has lower method detection limits (MDLs) than Methods 537M or 1633A, generally by one to two orders of magnitude.
    - For groundwater samples, Methods 537M and 1633A have lower MDLs than Method 8327 by about one order of magnitude.
    - The number of PFAS compounds analyzed is lower for Method 8327 (28) than 537M (42) or 1633A (46).
    - The overall cost of the analytical methods increases from 8327 to 537M to 1633A, with Method 1633A about twice as expensive as the other two methods.

  Based on the attributes summarized above, duplicate soil and groundwater samples would be analyzed using Method 537M if PFAS concentrations are relatively elevated to determine concentrations in the compounds not included in Method 8327. Method 1633A would be used to analyze samples where very low or no PFAS concentrations were measured in the corresponding screened sample, with anticipation that the results of the 1633A analysis would used to define the horizontal or vertical extent of PFAS impacts in the soil and groundwater. GF proposes to submit duplicate samples from 5 to 10 percent of the samples analyzed using

EPA 8327 for additional analysis using Method 537M or 1633A as part of our quality assurance/quality control (QA/QC) program.

- All water treatment discharge samples collected as part of WRR's WPDES permit would be analyzed for PFAS using Method 1633A.
- The next round of groundwater samples collected from monitoring wells/piezometers would be analyzed using Method 1633A. Subsequent groundwater samples collected from those monitoring wells/piezometers would be analyzed using Method 537M until the final round of samples are collected from that well/piezometer prior to either abandonment of the well/piezometer (if no longer needed to monitor the PFAS plume), or site closure (to document site conditions). The "final" round of PFAS samples would be analyzed using Method 1633A.
- The next round of water samples collected from private water supply wells and WRR's drinking water well would be analyzed for PFAS using 1633A. Depending on the results of those samples, subsequent samples from those wells will either be analyzed for PFAS using 1633A or Method 537M, which has lower MDLs than 1633A.

The table below presents a summary of the proposed analytical method(s) that would be used for each type of sample. The MDLs and compounds included with each analysis are included with this work plan as Attachment C.

Sample Type	Matrix (GW = groundwater)	Proposed Analytical Method(s)	Comments
Screening of investigation samples	Soil & GW	8327	Used during investigation activities to determine PFAS concentrations & hot spots. Subsequent analysis of samples dependent on screening results.
Additional analysis of investigation samples	Soil & GW	537M or 1633A	Approximately 5 to 10 % of the investigation samples would be submitted for additional PFAS analysis to provide better definition of impacts and as part of the QA/QC program.
Water treatment discharge	Water	1633A	All quarterly discharge samples collected as part of WRR's WPDES permit.
Routine GW & surface water monitoring	GW & surface water	1633A & 537M	The next round of samples would be analyzed using 1633A; subsequent samples analyzed using 537M until "final" round, then 1633A. Surface water samples are collected annually from Lowes Creek, which is not a public drinking water source.
Private water supply wells	Drinking water	1633A & 537M	The next round of samples collected from private water supply wells, including WRR's drinking water well, would be analyzed using 1633A; subsequent samples would be analyzed for 537M or 1633A, depending on previous sample results.

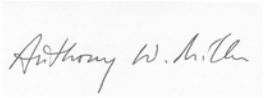
GF plans to collect the next round of samples from the monitoring wells, piezometers, Lowes Creek, and private wells in mid-May 2025 and would like to install the HydraSleeves in the monitoring wells and piezometers before the samples are collected. All those samples would be analyzed for PFAS using Method 1633A. GF is also planning

to collect additional soil and groundwater samples as part of ongoing investigation activities in 2025 and would like to use the screening and sampling methods listed above. Letters discussing the results of samples collected from the private wells will be sent to the well owners following receipt of the laboratory reports, and the WDNR will be copied on those letters. The results of the groundwater monitoring and soil and groundwater investigation activities will be included with each report submitted to the WDNR after completion of investigation activities.

Please review the work plan and attached data and then contact me at awmiller@gfnet.com or 608-354-7730 if you have any questions or need additional information to complete your review.

Sincerely,

GANNETT FLEMING, INC.



Anthony W. Miller, P.S.S.
Senior Project Manager
AWM/Enc.

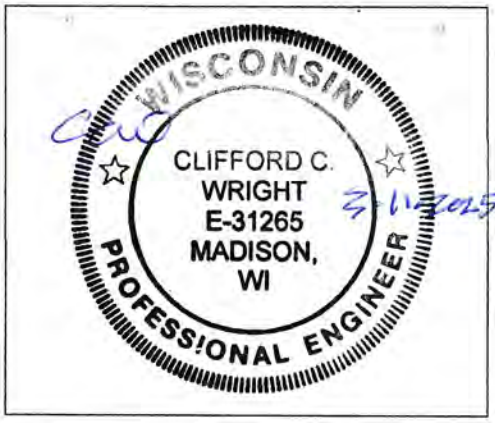
ecc: Jim Hager, Bob Fuller (WRR)
Leah Ziemba (Michael Best)

ENGINEERING AND HYDROGEOLOGIST CERTIFICATIONS

I hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Print Name Clifford C. Wright	Title Project Engineer/Geologist
Signature Clifford C. Wright	Date 3.11.2025

P.E. Seal for E-31265:



I hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Print Name Clifford C. Wright	Title Project Engineer/Geologist
Signature Clifford C. Wright	Date 3.11.2025

Work Plan for Proposed Sampling & Analytical Methods
Gannett Fleming, Inc. Project # 55929.007

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Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name	First	MI	Organization/ Business Name		
Hager	Jim		WRR Environmental Services Co. Inc.		
Mailing Address			City	State	ZIP Code
5200 Ryder Road			Eau Claire	WI	54701
Phone # (include area code)	Fax # (include area code)		Email		
(715) 834-9624			hagerj@WRRES.com		

The requester listed above: (select all that apply)

- ☒ Is currently the owner
- ☐ Is considering selling the Property
- ☐ Is renting or leasing the Property
- ☐ Is considering acquiring the Property
- ☐ Is a lender with a mortgagee interest in the Property
- ☐ Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

☐ Select if same as requester

Contact Last Name	First	MI	Organization/ Business Name		
Miller	Anthony	W	Gannett Fleming, Inc.		
Mailing Address			City	State	ZIP Code
8040 Excelsior Drive - Suite #303			Madison	WI	53717
Phone # (include area code)	Fax # (include area code)		Email		
(608) 327-5041			awmiller@gfnet.com		

Section 2. Property Information

Property Name			FID No. (if known)		
WRR Environmental Services Co. Inc.			618 026 530		
BRRTS No. (if known)			Parcel Identification Number		
02-18-587957			802422609034309004 & 1802422609101209000		
Street Address			City	State	ZIP Code
5200 Ryder Road			Eau Claire	WI	54701
County	Municipality where the Property is located		Property is composed of:		Property Size Acres
Eau Claire	○ City ○ Town ◉ Village of Washington		○ Single tax parcel ◉ Multiple tax parcels		16

1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

○ No ◉ Yes

Date requested by: 05/05/2025

Reason: We would like to install Hydrasleeves samplers and confirm analytical methods prior to May 2025 groundwater sampling event

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

◉ No. **Include the fee that is required for your request in Section 3, 4 or 5.**

◯ Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:
Section 3. Technical Assistance or Post-Closure Modifications;
Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [**Numbers in brackets are for WI DNR Use]**

☐ No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - Include a fee of $350. Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.

☒ Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of $700.**

☐ Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of $1050.**

☐ Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of $1050.**

☐ Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of $1050.**

☐ Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of $1050.**

☐ Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of $350**

☐ Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of $425.**

☐ Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of $425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

☐ Schedule a Technical Assistance Meeting - **Include a fee of $700.**

☐ Hazardous Waste Determination - **Include a fee of $700.**

☐ Other Technical Assistance - **Include a fee of $700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

☐ Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of $1050, and:**

- ☐ Include a fee of $300 for sites with residual soil contamination; and
- ☐ Include a fee of $350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Section 4. Request for Liability Clarification

Select the type of liability clarification requested. Use the available space given or attach information, explanations, or specific questions that you need answered in DNR's reply. Complete Sections 6 and 7 of this form. **[Numbers in brackets are for DNR Use]**

☐ "Lender" liability exemption clarification - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the real Property, and/or the personal Property and fixtures;

(2) an environmental assessment, in accordance with s. 292.21, Wis. Stats.;

(3) the date the environmental assessment was conducted by the lender;

(4) the date of the Property acquisition; for foreclosure actions, include a copy of the signed and dated court order confirming the sheriff's sale.

(5) documentation showing how the Property was acquired and the steps followed under the appropriate state statutes.

(6) a copy of the Property deed with the correct legal description; and,

(7) the Lender Liability Exemption Environmental Assessment Tracking Form (Form 4400-196).

(8) If no sampling was done, please provide reasoning as to why it was **not** conducted. Include this either in the accompanying environmental assessment or as an attachment to this form, and cite language in s. 292. 21(1)(c)2.,h.-i., Wis. Stats.:

h. The collection and analysis of representative samples of soil or other materials in the ground that are suspected of being contaminated based on observations made during a visual inspection of the real Property or based on aerial photographs, or other information available to the lender, including stained or discolored soil or other materials in the ground and including soil or materials in the ground in areas with dead or distressed vegetation. The collection and analysis shall identify contaminants in the soil or other materials in the ground and shall quantify concentrations.

i. The collection and analysis of representative samples of unknown wastes or potentially hazardous substances found on the real Property and the determination of concentrations of hazardous waste and hazardous substances found in tanks, drums or other containers or in piles or lagoons on the real Property.

☐ "Representative" liability exemption clarification (e.g. trustees, receivers, etc.) - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the Property;

(2) the date of Property acquisition by the representative;

(3) the means by which the Property was acquired;

(4) documentation that the representative has no beneficial interest in any entity that owns, possesses, or controls the Property;

(5) documentation that the representative has not caused any discharge of a hazardous substance on the Property; and

(6) a copy of the Property deed with the correct legal description.

☐ Clarification of local governmental unit (LGU) liability exemption at sites with: (select all that apply)

☐ hazardous substances spills - s. 292.11(9)(e), Wis. Stats. [649];

☐ Perceived environmental contamination - [649];

☐ hazardous waste - s. 292.24 (2), Wis. Stats. [649]; and/or

☐ solid waste - s. 292.23 (2), Wis. Stats. [649].

❖ **Include a fee of $700, a summary of the environmental liability clarification being requested, and the following:**

(1) clear supporting documentation showing the acquisition method used, and the steps followed under the appropriate state statute(s).

(2) current and proposed ownership status of the Property;

(3) date and means by which the Property was acquired by the LGU, where applicable;

(4) a map and the ¼, ¼ section location of the Property;

(5) summary of current uses of the Property;

(6) intended or potential use(s) of the Property;

(7) descriptions of other investigations that have taken place on the Property; and

(8) (for solid waste clarifications) a summary of the license history of the facility.

Section 4. Request for Liability Clarification (cont.)

☐ Lease liability clarification - s. 292.55, Wis. Stats. [646]

- ❖ **Include a fee of $700 for a single Property, or $1400 for multiple Properties and the information listed below:**

(1) a copy of the proposed lease;

(2) the name of the current owner of the Property and the person who will lease the Property;

(3) a description of the lease holder's association with any persons who have possession, control, or caused a discharge of a hazardous substance on the Property;

(4) map(s) showing the Property location and any suspected or known sources of contamination detected on the Property;

(5) a description of the intended use of the Property by the lease holder, with reference to the maps to indicate which areas will be used. Explain how the use will not interfere with any future investigation or cleanup at the Property; and

(6) all reports or investigations (e.g. Phase I and Phase II Environmental Assessments and/or Site Investigation Reports conducted under s. NR 716, Wis. Adm. Code) that identify areas of the Property where a discharge has occurred.

General or other environmental liability clarification - s. 292.55, Wis. Stats. [682] - Explain your request below.

- ❖ **Include a fee of $700 and an adequate summary of relevant environmental work to date.**

☐ No Action Required (NAR) - NR 716.05, [682]

- ❖ **Include a fee of $700.**

Use where an environmental discharge has or has not occurred, and applicant wants a DNR determination that no further assessment or clean-up work is required. Usually this is requested after a Phase I and Phase II environmental assessment has been conducted; the assessment reports should be submitted with this form. This is not a closure letter.

☐ Clarify the liability associated with a "closed" Property - s. 292.55, Wis. Stats. [682]

- ❖ **Include a fee of $700.**

- Include a copy of any closure documents if a state agency other than DNR approved the closure.

Use this space or attach additional sheets to provide necessary information, explanations or specific questions to be answered by the DNR.

Section 5. Request for a Specialized Agreement

Select the type of agreement needed. Include the appropriate draft agreements and supporting materials. Complete Sections 6 and 7 of this form. More information and model draft agreements are available at: dnr.wi.gov/topic/Brownfields/lgu.html#tabx4.

☐ Tax cancellation agreement - s. 75.105(2)(d), Wis. Stats. [654]

- ❖ **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,

(2) a copy of the Property deed with the correct legal description.

☐ Agreement for assignment of tax foreclosure judgement - s.75.106, Wis. Stats. [666]

- ❖ **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,

(2) a copy of the Property deed with the correct legal description.

☐ Negotiated agreement - Enforceable contract for non-emergency remediation - s. 292.11(7)(d) and (e), Wis. Stats. [630]

- ❖ **Include a fee of $1400, and the information listed below:**

(1) a draft schedule for remediation; and,

(2) the name, mailing address, phone and email for each party to the agreement.

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

- ☐ Phase I Environmental Site Assessment Report - Date: _____
- ☐ Phase II Environmental Site Assessment Report - Date: _____
- ☐ Legal Description of Property (required for all liability requests and specialized agreements)
- ☐ Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

☐ Groundwater ☐ Soil ☐ Sediment ☐ Other medium - Describe: _____

Date of Collection: _____

- ☐ A copy of the closure letter and submittal materials
- ☐ Draft tax cancellation agreement
- ☐ Draft agreement for assignment of tax foreclosure judgment
- ☒ Other report(s) or information - Describe: Work Plan for Proposed Sampling & Analytical Methods dated 3/11/25

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

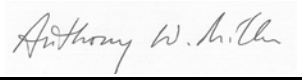
- ◯ Yes - Date (if known): _____
- ◯ No

Note: The Notification for Hazardous Substance Discharge Form - Non-Emergency Only (Form 4400-225) is accessible through the RR Program Submittal Portal application. Directions for using the form and the Submittal Portal application are available on the Submittal Portal web page.

Section 7. Certification by the Person who completed this form

- ☐ I am the person submitting this request (requester)
- ☒ I prepared this request for: Jim Hager - WRR
  Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.



Signature

March 11, 2025
Date Signed

Environmental Consultant - Project Manager
Title

(608) 327-5041
Telephone Number (include area code)

ATTACHMENT A

EON PRODUCTS' HYDRASLEEVE INFORMATION

GANNETT FLEMING

Can I use a HydraSleeve for my groundwater project?

EON Products, Inc. |800-474-2490 |770-978-9971| www.eonpro.com

What can the HydraSleeve sample for?

HydraSleeves are passive samplers that grab and seal a core of water (and everything in it) from a specific interval of the water column in your well screen ("saturated screen") or borehole. **Therefore, any chemical, solid, and physical parameter that is present in the saturated screen at the interval where you collect the sample will be represented in your sample.**

HydraSleeves are successfully used for organics (VOCs and SVOCs), metals, ions, inorganics, pesticides, 1,4-Dioxane, PFAS, physical parameters, and more. For some of these constituents of concern (CoCs), we have data available on our website (click "Data" link at bottom of page) from bench tests and third-party field studies that have been published or shared with us. However, HydraSleeves are also used for many other CoCs on projects where results are not available to the public.

What else do I need to consider when evaluating HydraSleeves for my project(s)?

Please review the SOP and contact EON for further details, considerations, and project guidance.

Well Diameters & Depths: For wells and boreholes with 2" and larger diameters, we have options for all CoCs. For 1" wells with Sch 40 casing, we have an option for non-PFAS CoCs. There is no known maximum sample depth, and HydraSleeves have been used in wells over 1500ft deep.

HydraSleeve Placement: All passive groundwater samples represent a specific interval of the saturated screen. The HydraSleeve is placed *beneath* the interval where it will collect the sample, rather than within the sample interval. In some cases, HydraSleeves may need to be compressed with a top weight to sample the correct interval. Factors such as saturated screen length, formation stratification or bedrock fractures, and some CoC characteristics (e.g. "floaters" or "sinkers") may also affect where samplers should be placed. Ask EON for guidance based on the details below, including a diagram showing HydraSleeve Sample intervals.

Sample Volume: There are HydraSleeves available for a wide range of sample volumes, depending on the dimensions of your saturated screen. In a 2" well, each 5ft of saturated screen can yield just over 1L of volume for any passive sampling method. Wider diameters or longer saturated screens can yield larger volumes when larger or multiple sleeves are used.

Residence Time (RT) in the Well: HydraSleeves should be left in place in the well after deployment and before retrieving/sampling, until groundwater returns to ambient conditions. EON Recommends 24-48 hours minimum RT before retrieving, though some site conditions may allow only a few hours RT or require several days minimum RT. There is no maximum residence time under most conditions.

Solids & Turbidity: HydraSleeve samples include any solids present in the sample interval, without contributing additional, method-induced turbidity. Sample can be filtered after retrieval if needed.

Suspension Tethers: HydraSleeves are deployed on a suspension tether with a bottom weight. Depending on the type of sleeve you use, other reusable or well-dedicated accessories may also be required on your tether. Ask EON for recommendations and/or about our convenient and affordable service for your well-dedicated, custom tethers.

Side-by-side Studies/Field Comparisons: Please let EON know if you are planning to conduct a comparison with another sampling method or historical data! We have guidance and recommendations (based on USGS and ITRC publications) for planning and evaluating your comparison.

SOP Link: https://www.eonpro.com/wp-content/uploads/2023/04/HydraSleeve-SOP-2.0-2023-1.pdf
Data Link: https://www.eonpro.com/documents-resources/

Assessing HydraSleeve Samplers for Acquiring Representative PFAS Concentrations in Aqueous Environments

Bench-Scale Study

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1. Introduction

1.1 Background

Per- and polyfluoroalkyl substances (PFAS) are man-made substances often referred to as the "forever chemicals" because they do not naturally breakdown in the environment. PFAS have been found to be ubiquitous in the environment and detrimental to human health, and therefore subject to regulation, environmental monitoring, and remedial action. The remedial action levels are extremely low compared to other environmental contaminants, often in the double-digit parts per trillion (ng/L) range. Because the Maximum Concentration Levels (MCLs) are so low, sampling for PFAS requires an elevated level of rigor in the procedures, and confidence in equipment used, for obtaining the samples.

The HydraSleeve is a passive grab sampler used to obtain a representative "whole-water" sample from an interval in groundwater monitoring wells and surface water. The HydraSleeve captures a sample that includes the aqueous medium, and everything dissolved or suspended in the medium at the time of sampling, so it can be applied universally for sampling any contaminant. Over 1 million samples have been collected using HydraSleeves, to comply with groundwater monitoring and remediation requirements since the year 2000. Since 2016 approximately sixty-thousand High Density Polyethylene (HDPE) HydraSleeves have been used to collect samples of groundwater with suspected or actual per- and polyfluoroalkyl substances (PFAS) contamination.

The expanding use of the HDPE HydraSleeves for PFAS sampling has been supported by many private, site-specific studies, such as those comparing field samples collected using HydraSleeves to samples collected using low-flow pumping methods. However, because of the sensitive and costly nature of sites contaminated with PFAS, these field test results are rarely made public. In light of these confidentiality and funding concerns, the current study provides publicly available evidence about the accuracy of the HydraSleeves as a PFAS sampling method.

1.2 Study Objectives

This study was conducted to provide a controlled-environment evaluation of the use of the HDPE HydraSleeve for obtaining representative concentrations of PFAS at low-ng/L concentrations in aqueous environments. HDPE HydraSleeve samples were collected from a controlled test chamber filled with PFAS-spiked water. A third-party laboratory used EPA Draft Method 1633 to analyze the HydraSleeve samples and Control volumes of the water in the test chamber for PFAS concentrations. Results from the HydraSleeves were compared to Control results to determine whether the PFAS concentrations from HydraSleeve samples accurately represented the actual PFAS concentrations in the chamber where the samples were collected. The study also tested whether HDPE HydraSleeves leached PFAS into samples or adsorbed PFAS from samples to determine if HydraSleeves present potential sources for results bias.

2. Materials

The HydraSleeves and related materials and procedures used in this study were selected and used according to the guidance in the HydraSleeve Standard Operating Procedure manual, linked here. A short summary of their function is included below for reference. More information and details on these materials and procedures, as well as procedural and assembly variations for different conditions and product subtypes, can be found in that SOP. The test chamber was constructed specifically for the purpose of controlled comparison study and is not a part of the SOP.

2.1 HDPE HydraSleeve "SuperSleeve" Samplers

HydraSleeves are a type of passive grab sampler for use in obtaining representative samples of groundwater and other aqueous environments. The HydraSleeves used in these tests were the 1-liter sample volume HydraSleeve (1.7x~38"), SuperSleeve models, constructed of High-Density Polyethylene (HDPE), for sampling PFAS in water. HydraSleeves are flexible, flattened tubes that are sealed at the bottom and have a reed valve below the unsealed top end. The sleeves are deployed empty, and hydrostatic pressure keeps the sampler closed and empty during deployment and residence. When

the samplers are pulled upward through the water column during retrieval, the top of the HydraSleeve opens, allowing the sampler to "sleeve" around the stationary water column to capture a core of water inside. When the HydraSleeve is full, hydrostatic pressure collapses the reed-valve, sealing the sample inside and isolating it from the surrounding water for the rest of the retrieval process.

This process of sample collection where the HydraSleeve fills and is sealed occurs in a discrete sample interval that starts at the initial position of the top of the installed HydraSleeve and extends upwards for a distance that is approximately the length of the sampler. Water from outside of the sample interval is not captured in the HydraSleeve or represented in the sample. To fill laboratory containers with a HydraSleeve sample, the sleeve is punctured with a polypropylene discharge straw, and the sample water is drained through the straw into the laboratory containers. *Note: HydraSleeves are single-use samplers and must be replaced after each sampling event.*

2.2 Suspension Tethers & Accessory Items for HDPE HydraSleeves Deployment

Two factory-made suspension tethers were used to convey the samplers in and out of the test chamber and to hold the samplers in place between installation and removal. The tethers were the standard factory construction supplied as an option to purchasers of HydraSleeves. Tethers are constructed of braided polypropylene rope with the following items installed: stainless steel connection rings, polyamide snap connectors, Nylon™ zip-ties, and an aluminum ID Tag. Stainless steel weights were connected to the bottom of each tether to pull the sampler and tether downward through the water column and into place. The following items were also attached to the tether and HydraSleeve assembly in this study, according to best practice noted in the SOP. *Note: For field use, suspension tethers are usually well-dedicated and reusable, with the related accessories to reduce disposal and decontamination procedures required.*

- **Standard Top Collar Assembly:** A reusable, two-piece threaded PVC adaptor that attaches to the top of the HydraSleeve to facilitate attachment of the HydraSleeve to the suspension tether.

- **Weighted Top Collar Assembly:** A reusable, two-piece threaded top collar assembly made of PVC and stainless steel that attaches at the top of the HydraSleeve to facilitate attachment of the HydraSleeve to the suspension tether. The optional weight compressed the sleeve against the bottom of the well, allowing the sample interval to start close to the bottom of the well or chamber.

- **Spring Clip:** A stainless steel clip, shaped like a downward facing "U", that attaches to the connection rings on the suspension tether and clips into the top collar assembly (standard or weighted) at the top of each HydraSleeve, above the reed-valve.

2.3 Test Chamber for Comparison Study

A test chamber was constructed of an 8-inch diameter by 8-foot-long PVC pipe that was capped at the bottom and vertically mounted. A sampling port was installed at the approximate midpoint to allow the direct collection of the chamber water as a Control for comparison. Ports were installed near the bottom and top of the chamber and connected to a low-volume peristaltic recirculating pump with silicone tubing. The top of the chamber was fitted with a compression well-cap to seal the chamber from outside air during testing. The chamber was filled to a height of approximately 7.5 feet using approximately 74.1 liters of potable tap water. This water column was spiked with a blend of 40 PFAS obtained from AccuStandard, Inc. (New Haven, CT.), and the water in the chamber was recirculated for approximately 27 hours from top to bottom using the low volume peristaltic pump to ensure thorough initial mixing. A stabilization period of 42 hours was allowed for the PFAS in the test chamber to equilibrate with the test-chamber materials before placing the HydraSleeves in the chamber.

3. Procedures

3.1 HydraSleeve and Tether Materials Quality Test Procedures

Equipment rinsate tests are widely recommended when sampling for PFAS to determine if PFAS is present on the sampling equipment that could potentially leech into the sample. The HydraSleeve rinsate tests and the tether soak tests were conducted in accord with these recommendations, to validate that the HydraSleeves and suspension tethers are not a source for PFAS that could bias sample results. Results from both tests were compared to results from a Control sample of the water used for rinsing and soaking.

3.1.1 Rinsate Test (HDPE HydraSleeves)

Rinsate tests were performed on three 1.7 x 38-inch (1L) HDPE HydraSleeves. Each of the three HDPE HydraSleeves were filled with laboratory-produced, PFAS-free, deionized water. The water was held in the sleeves for approximately 5-minutes, in accordance with the HydraSleeve SOP recommendation to sample the sleeves immediately after retrieval. Each sampler was then punctured, and its contents drained via discharge straw into two lab-provided, 500mL HDPE sample containers.

3.1.2 Soak-Test (Suspension Tethers)

A soak test was performed on suspension tether components and accessories used with the HydraSleeve. The tether materials were soaked, rather than rinsed, because the surface area of the tether materials was small, and a longer contact time with the deionized water would be more likely to reveal if low levels of PFAS leaching were to occur.

A one-foot-long section of 3/16-in diameter polypropylene braided rope was placed in a 1-Liter, HDPE laboratory-provided sample bottle along with other tether components consisting of two 0.50-inch diameter stainless-steel connection rings, one 1-inch diameter stainless-steel hanging ring, one stainless-steel spring clip, two nylon zip-ties, one polyamide snap-connector, and one 1-inch diameter, stainless-steel ID Tag. Laboratory-provided PFAS-free, deionized water was used to fill the bottle, the bottle was capped and shaken for 30 seconds, and then left to soak for one hour. At the end of the soaking period the liquid was poured into two laboratory-provided, 500mL HDPE sample bottles.

3.1.3 Rinse Water Control

As a Control for comparing the results of the rinsate test and the soak test, two additional 500mL HDPE lab containers were filled with additional lab-provided DI water from the same lot that was used for the two quality tests.

3.2 Comparison Test Procedures

In order to evaluate the extent to which HydraSleeve samples provide an accurate representation of the surrounding aqueous environment, samples were collected from the PFAS-spiked the test chamber using HydraSleeves, and the HydraSleeve sample results were compared to two baseline/Control results from the water surrounding the sleeves in the chamber. The samples were tested for concentrations of 40 commonly sampled PFAS. In addition to a comparison using HydraSleeves discharged immediately after retrieval as recommended, a delayed-discharge test was performed to ascertain whether a sample is affected by prolonged/extended residence in a HydraSleeve after retrieval from the sampling environment.

3.2.1 HydraSleeve Setup & Deployment

The HDPE HydraSleeve comparison test was performed using 6 of the 1.75-inch x 38-inch x ~1.1L HDPE HydraSleeve “SuperSleeves,” which were deployed and retrieved following the guidance of the Standard Operating Procedure linked in the Materials section above. Three HydraSleeves were attached side-by-side to each of two bottom-weighted polypropylene suspension tethers using stainless-steel spring-clips and top collar assemblies. Two samplers on each tether were fitted with PVC Top Collars and one sampler on each tether was fitted with a PVC/Stainless-steel Top Collar Weight to provide weight to compress the sleeves against the bottom of the test chamber and allow sufficient water column for sampling.

The tethers and empty HydraSleeves were lowered into in the test chamber that had previously been spiked with PFAS compounds at low (ng/L) concentrations. The top of the HydraSleeves were positioned about 18-inches from the bottom of the test chamber, leaving approximately 6 feet of water column above the top of the sleeves. The tops of the tethers were attached to the underside of the compression cap using a snap connector and a stainless-steel ring. The compression cap at the top of the test-chamber was then sealed, and a low-volume peristaltic recirculation pump was turned on for three-hours to ensure the column was thoroughly mixed after installing the samplers, and then turned off. The HydraSleeves were left in-place undisturbed for 48 hours prior to sampling.

3.2.2 Collection of Controls

Two Control samples were collected as a way to gauge repeatability of results. The first Control sample was taken immediately prior to collecting the HydraSleeve samples, and the second Control sample was collected immediately after all the HydraSleeves had been removed from the test chamber and sampled. The same procedure was followed for both Controls:

Control samples representing the PFAS concentrations of the water in the chamber were collected from the discharge port at the midpoint of the test chamber, which approximately corresponded with the midpoint of where the HydraSleeve samples would be collected. Samples were discharged into two laboratory-provided, 500mL HDPE sample bottles. Care was taken so that the Control water did not contact any materials other than the test chamber and the HDPE sample bottles.

Because both Controls were collected using the same location and procedure, any differences between the results from the two Controls should only reflect variations in the chamber water caused by removing the samplers, exposure to air, influences of sample handling, or contribution from the laboratory environment. Therefore, Laboratory results from the two Control samples can be compared to each other and used as a baseline of expected and acceptable variability between actual sample results and Controls.

3.2.3 HydraSleeve Retrieval and Sampling

After the first Control sample was collected, the HydraSleeves were retrieved according to instructions in the SOP. Each tether was pulled upward through the water column a distance of about 38-inches, at a rate of about 1 foot per second. When the HydraSleeves were filled, one sampler at a time was removed from the chamber and suspended in the air on a tripod for sample collection.

Each 1L sleeve was punctured with a discharge straw and drained into two laboratory-provided, 500mL HDPE bottles. The first four (4) HydraSleeves were each sampled within 5 minutes of being removed from the chamber, as is typical for field sampling and in accordance with the manufacturer's instructions to discharge the samplers immediately after recovery. The remaining two sleeves were used for the delayed discharge test below.

3.3 Delayed Discharge Test Procedure

The two remaining HydraSleeves were sampled at delayed intervals following retrieval from the sample chamber. One HydraSleeve was suspended in the air for 15 minutes before the sample was discharged to the lab bottles. The other HydraSleeve was suspended in the air for 20 minutes before the sample was discharged to the lab bottles.

3.4 Sample Container Shipment & Laboratory Procedure

The 500mL HDPE sample bottles (for all tests) were provided by the test laboratory in accordance with the recommendations of EPA Method 1633-draft for PFAS analysis of aqueous solutions. Each HDPE sample bottle was labeled and put on ice, in a cooler, immediately after the sample or Control was collected. The coolers were shipped to Enthalpy Analytical Laboratories, LLC, El Dorado Hills, CA, for analysis for the entire suite of 40 PFAS using EPA Method 1633-Draft.

4. Analysis and Results

4.1 HydraSleeve Rinsate Test Results

Method 1633-draft analyses of the rinsate test sample and the soak test sample showed non-detect results across all 40 PFAS in all samples, validating that HDPE HydraSleeves and manufacturer provided suspension tethers do not contain these PFAS. Therefore, the use of HDPE HydraSleeves and these factory-provided tether materials for sampling PFAS in water will not bias results to indicate higher concentrations than the actual concentrations in the water, even at low ng/L levels. All results from the Method 1633-draft PFAS analysis of samples from the rinsate and soak tests and the Control sample of the laboratory produced, PFAS-Free deionized water used in the tests are shown in Appendix A.

4.2 HydraSleeve Comparison Test Results and Analysis

Six test samples were recovered from the test chamber water, one from each of six HDPE HydraSleeves. Two Control samples of the chamber water surrounding the HydraSleeves were also collected directly from chamber via a discharge port. Each of these eight total samples was analyzed by Enthalpy Analytical Laboratories for the entire suite of 40 PFAS using Method 1633 Draft. The water in the chamber was not analyzed before the PFAS blend was added or before the first Control was acquired, because the purpose of the test was to show how HydraSleeve test samples compared to Control samples of the water at the point in time the samples were collected. All results from the test and Control sample analyses are presented in Table 1.

4.2.1 Non-Detect, "j" Qualifier- Flagged, and Outlier Results

Several PFAS in the test chamber had concentrations below the RL and/or the MDL in at least one Control sample, as shown in Table 1. Because non-detect results (below the MDL) do not produce numerical concentration values, non-detect results were excluded from the comparison analysis. Results below the reporting limit (RL) but above the MDL were flagged by the laboratory with a "j" qualifier, indicating laboratory-estimated concentration values. Lab estimated results were included in our comparison analyses but are described below for reference, along with an outlier.

- All HydraSleeve and Control sample results for 5:3 FTCA (MDL 6.86 ng/L) and HFPO-DA (MDL 1.73 ng/L) were non-detect, indicating that the test-chamber concentrations were too low for laboratory detection. These compounds were excluded from comparative analysis.

- All HydraSleeve sample results for 7:3 FTCA, MeFOSE, and EtFOSE were j-flagged as estimated values. Results from one Control sample for 7:3 FTCA and one Control sample for MeFOSE were also estimated (j-flagged) values, while the other Control in each case was non-detect. The lab-estimated results for the HydraSleeve samples and the Controls, were included for comparative analysis. The ND Controls were excluded.
- One Control for 3:3 FTCA was significantly lower than the other Control for an undetermined reason. This result is an outlier, because the other Control sample and all the HydraSleeve samples for 3:3 FTCA produced results with values similar to each other. To be conservative, the outlier value was included in the comparative analyses.

4.2.2 Comparison Results Overview

The data shows in Table 1 that the results from the six HydraSleeve samples are close in value to all the other HydraSleeve samples and to the test chamber Control samples for each PFAS that was detected in the chamber (See Appendix B for descriptive statistics). Results were also similar between HydraSleeve samples and Control samples in showing that the concentration for a given PFAS was below the MDL and/or the reporting limit (RL), as discussed below.

Of the 228 PFAS results from HydraSleeve samples, including those sampled by immediate and delayed discharge, 130 individual PFAS results (57%) were less than 2 ng/L different from the average of the two Control samples (one taken

before HydraSleeve sampling, and one taken after HydraSleeve sampling). Over 81% of the HydraSleeve results were less than 4 ng/L different than the average of the Controls, and 91% of the HydraSleeve results were less than 6 ng/L different from the average of the Controls. This confirms the repeatability and precision, as well as overall accuracy, of the HydraSleeve for sampling low levels of PFAS.

Figure 1 highlights the comparison results for three specific PFAS (PFOS, PFOA, and PFNA) that are sometimes considered "Priority" PFAS (e.g., by the state of New Jersey) and have specific MCLs /GWQS of 13-14 ng/L. For each of these three PFAS, the concentration average of the HydraSleeve samples was within 0.5 ng/L of the Control sample average.

Table 1	**HDPE HydraSleeve PFAS Recovery Test (ng/L)**								
	HydraSleeve Sample ID						**Control Sample ID**		
PFAS Analyte	**10M-8066 (HS)**	**10M-8116 (HS)**	**10M-8086 (HS)**	**10M-8106 (HS)**	**10M-8096 (15 Minutes)**	**10M-8076 (20 Minutes)**	**10M-C8056 (Control-Before)**	**10M-C8136 (Control-After)**	**Lab RL***
11Cl-PF3OUdS	29.00	24.40	20.00	24.30	21.90	21.20	22.20	28.20	6.06
3:3 FTCA	51.20	35.70	40.30	39.70	44.40	44.70	47.20	15.50	8.08
4:2 FTS	109.00	103.00	106.00	109.00	101.00	101.00	103.00	96.70	6.06
5:3 FTCA	ND	ND	ND	ND	ND	ND	ND	ND	40.40
6:2 FTS	93.80	89.20	93.20	97.70	91.20	89.00	90.00	91.60	6.13
7:3 FTCA	11.40 (j)	4.30 (j)	5.00 (j)	4.63 (j)	6.97 (j)	7.01 (j)	10.10 (j)	ND	40.40
8:2 FTS	103.00	87.80	93.90	101.00	89.20	95.10	92.50	95.20	6.20
9Cl-PF3ONS	31.40	30.90	27.10	31.00	28.40	28.30	30.60	34.60	6.31
ADONA	21.60	21.00	20.10	22.20	20.20	20.00	20.10	22.70	6.39
EtFOSA	5.58	3.99	4.24	4.04	3.89	3.61	5.87	3.32	1.62
EtFOSAA	34.10	34.80	33.30	35.70	30.30	33.10	38.30	39.90	1.62
EtFOSE	11.30 (j)	10.60 (j)	10.60 (j)	10.5 (j)	9.50 (j)	10.10 (j)	13.60 (j)	11.50 (j)	16.20
HFPO-DA	ND	ND	ND	ND	ND	ND	ND	ND	6.75
MeFOSA	8.35	5.48	6.03	6.46	5.59	5.41	6.79	3.59	1.62
MeFOSAA	45.60	47.40	44.60	48.10	43.60	47.20	49.60	51.20	1.62
MeFOSE	6.54 (j)	2.92 (j)	3.99 (j)	3.47 (j)	3.80 (j)	3.82 (j)	4.41 (j)	ND	16.20
NFDHA	25.80	25.80	23.10	26.40	25.60	25.20	26.70	25.50	3.23
PFBA	148.00	142.00	141.00	155.00	142.00	146.00	148.00	143.00	6.47
PFBS	27.20	26.40	26.40	29.70	26.10	26.00	25.90	24.90	1.43
PFDA	37.40	33.30	34.90	38.00	33.30	33.90	34.30	38.00	1.62
PFDoA	42.90	41.90	35.50	44.60	39.80	38.80	38.90	45.00	1.62
PFDoS	21.30	19.00	15.70	20.30	18.20	19.00	16.60	23.60	1.57
PFDS	27.20	22.60	19.30	23.80	21.90	22.40	20.60	27.00	1.56

Table 1 Continued Below

PFAS Analyte	10M8066 (HS)	10M8116 (HS)	10M8086 (HS)	10M8106 (HS)	10M8096 (15 Minutes)	10M8076 (20 Minutes)	10MC8056 (Control-Before)	10MC8136 (Control-After)	RL*
PFEESA	29.30	26.90	25.40	28.40	26.50	26.50	28.10	26.30	2.88
PFHpA	42.50	41.10	41.20	44.20	40.50	41.00	42.00	43.20	1.62
PFHpS	25.30	24.20	23.90	27.10	24.30	27.40	25.20	26.30	1.54
PFHxA	40.20	37.00	36.00	40.00	38.50	40.80	38.90	37.10	1.62
PFHxS	25.20	23.00	22.70	24.90	22.80	23.50	24.30	23.50	1.48
PFMBA	24.80	23.70	24.40	26.10	23.90	25.20	24.70	24.30	3.23
PFMPA	23.70	24.50	22.00	23.70	21.30	23.70	24.20	24.60	3.23
PFNA	42.60	39.90	36.90	40.30	38.10	38.10	40.90	38.00	1.62
PFNS	22.10	19.00	17.30	20.60	18.30	19.90	18.50	22.60	1.56
PFOA	36.30	35.10	35.70	38.40	36.30	35.20	37.40	35.10	2.02
PFOS	24.10	24.10	22.90	25.90	23.90	26.00	24.20	25.30	1.51
PFOSA	35.40	41.60	40.30	42.50	40.90	39.70	44.00	44.00	1.62
PFPeA	89.90	103.00	104.00	112.00	104.00	109.00	105.00	95.30	3.23
PFPeS	25.50	23.10	24.20	25.60	24.00	24.40	26.40	24.70	1.52
PFTeDA	29.70	29.50	26.60	31.10	27.40	26.70	27.20	32.00	1.62
PFTrDA	32.50	32.00	27.70	33.60	31.00	28.30	29.70	33.30	1.62
PFUnA	41.30	35.90	33.30	36.40	32.20	33.90	35.00	39.30	1.62

*Table 1: *The Lab RL shown in Table 1 are the maximum values for each analyte out of the eight samples tested by the lab. See Appendix A for Lab MDLs. "(j)" values are lab qualifiers indicating estimated results above the MDL and below the RL. "ND" indicates a non-detect result. (Section 4.2)*

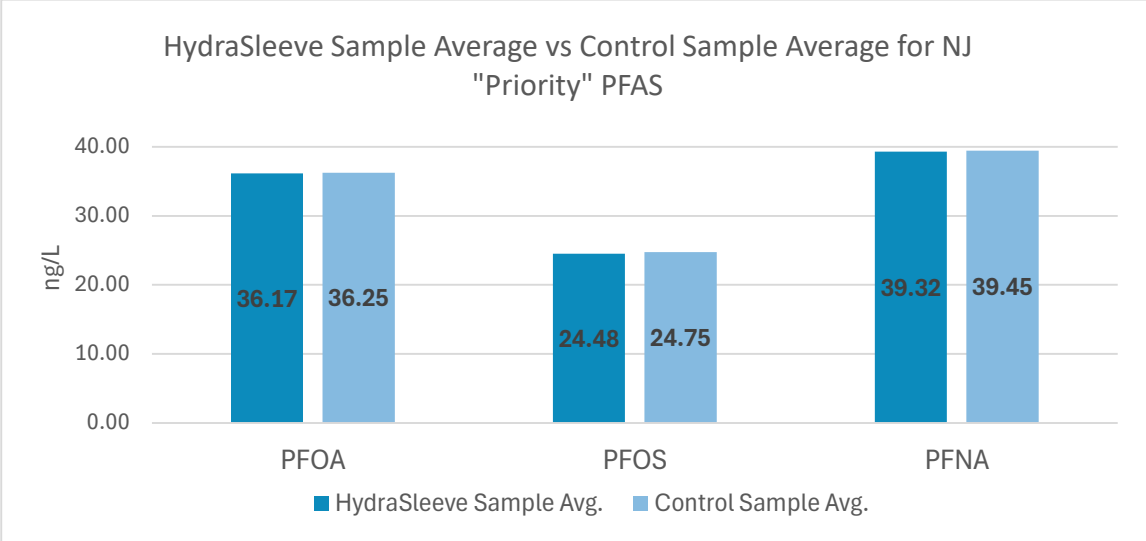


Figure 1: Bar charts show the average concentration from 6 HydraSleeve samples of the 3 New Jersey Priority PFAS compared with the average of two Control samples for those PFAS. (Section 4.2.2)

4.2.3 Comparative Analysis Results

As shown in Table 1, the results from the six HydraSleeve samples are close in value to all the other HydraSleeve samples and to the test chamber Control samples for each PFAS that was detected in the chamber. The comparison of the HydraSleeve samples to the Control samples was assessed via 1:1 correlation.

The U.S. Geological Survey (Imbrigiotta, T. E., & Harte, P. T. 2020. Passive sampling of groundwater wells for determination of water chemistry (No. 1-D8).) suggests that "one of the more effective ways to compare concentration results is to plot the data on a 1:1 correspondence on an X-Y plot with the passive sampling (HydraSleeve) results on one axis and the active sampling (Control) results on the other axis. If the two sampling methods collect the same concentrations, the points will plot on or close to the 1:1 correspondence line." This analysis is presented below.

To determine an overall statistical correlation between results from HydraSleeves samples and results from Control samples, the average of all six HydraSleeve results for each of the 38 PFAS that were detected were plotted against the average of the two corresponding Control results (Figure 2). The resulting 1:1 plot of these 38 data pairs shows a very high positive correlation, having an R^2 value of .996, showing that overall, HydraSleeve samples provide statistically similar results to Control samples for the PFAS analyzed by Method 1633.

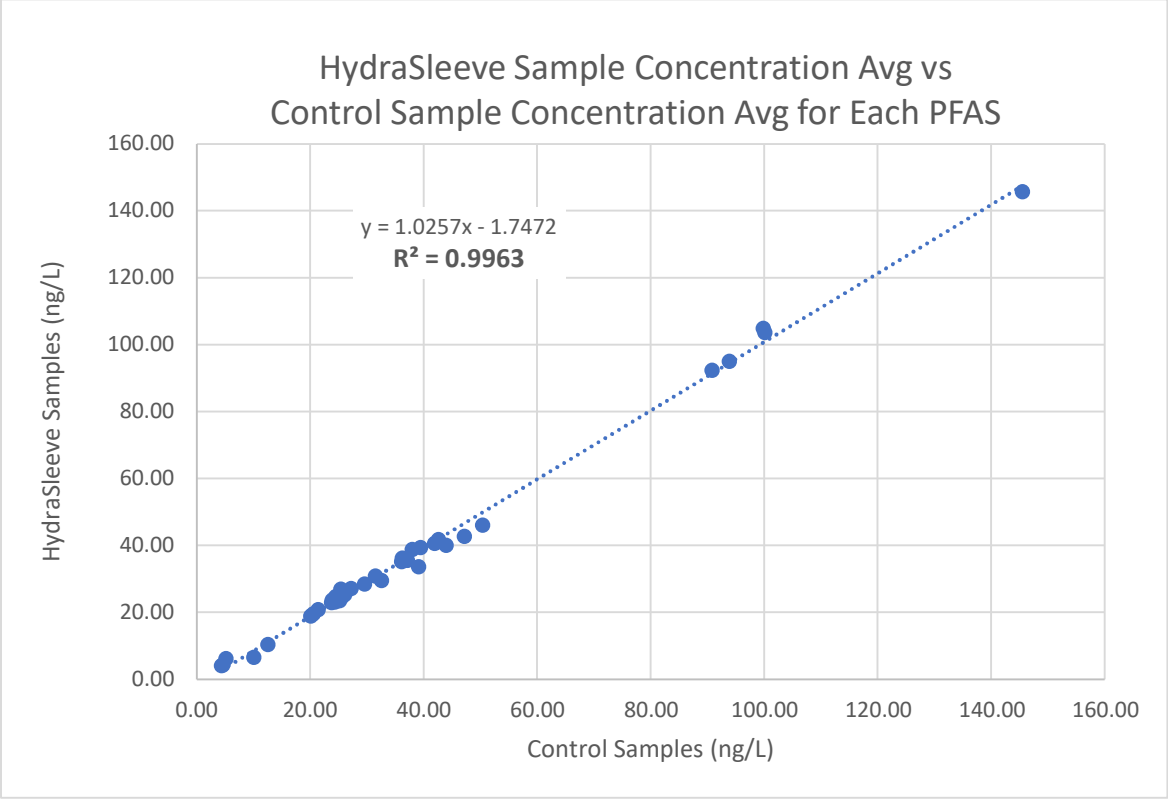


Figure 2: Each data point represents the average concentration from the 6 HydraSleeve Samples compared to the average concentration for the 2 Control samples for one of the 38 PFAS detected in the study. The samples from the HydraSleeves demonstrated 99.6% correspondence with the Controls. (Section 4.2.3)

4.3 Delayed Discharge Test Results

The PFAS concentrations from the HydraSleeve samples that were discharged after a 15-minute delay and after a 20-minute delay were each plotted against the Control sample average (Figure 3 and Figure 4, respectively), to evaluate whether the samples were still representative after extended exposure to the inside of the HDPE HydraSleeves. Both delayed-discharge samples still showed excellent 1:1 correspondence with the Controls for the 38 PFAS that were detected in this study, with an R^2 value of .995 for the 15-minute-delay sample and an R^2 of 0.996 for the 20-minute-delay sample. To further demonstrate the consistency of these delayed-discharge results with the immediate-discharge sample results, the average of the four immediate-discharge HydraSleeve samples for each PFAS were also plotted against the Control average for those PFAS in Figure 5, demonstrating an extremely similar R^2 value of 0.996.

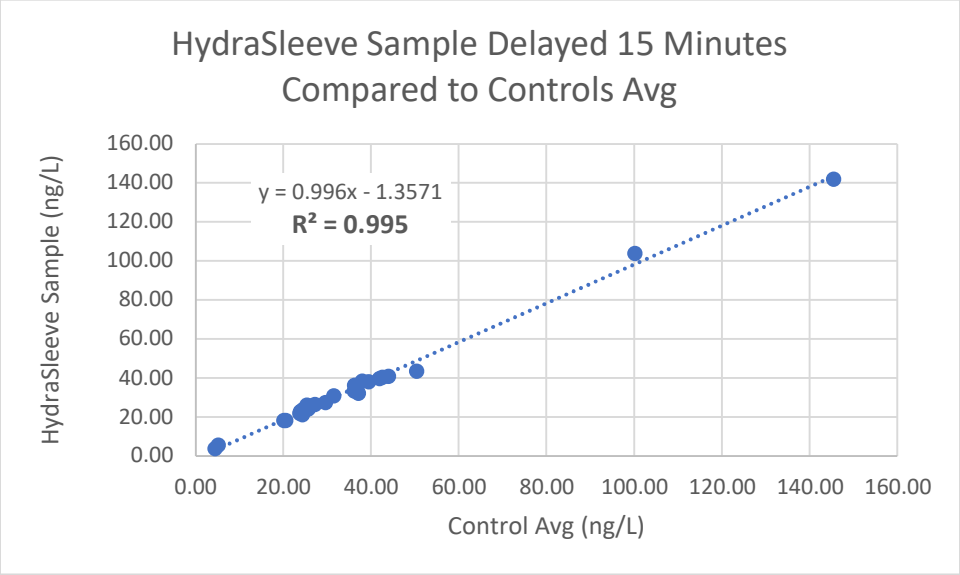
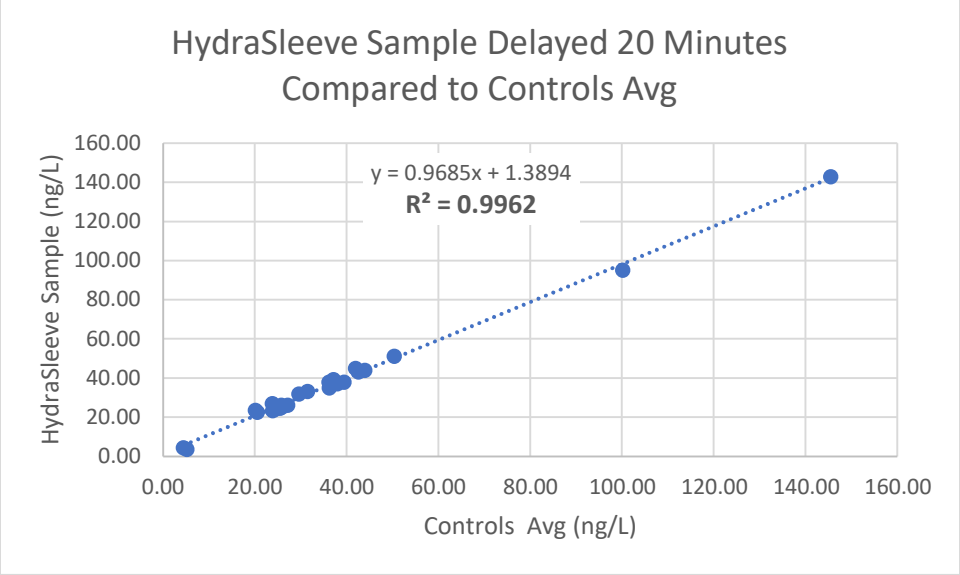


Figure 3 (above) and **Figure 4** (below): Scatter plots of concentrations from a delayed-discharge HydraSleeve sample compared to the average concentration for the 2 Control samples each of 38 PFAS. Figure 3 shows the 15-minute delay sample, and Figure 4 shows the 20-minute delay sample. (Section 4.3)



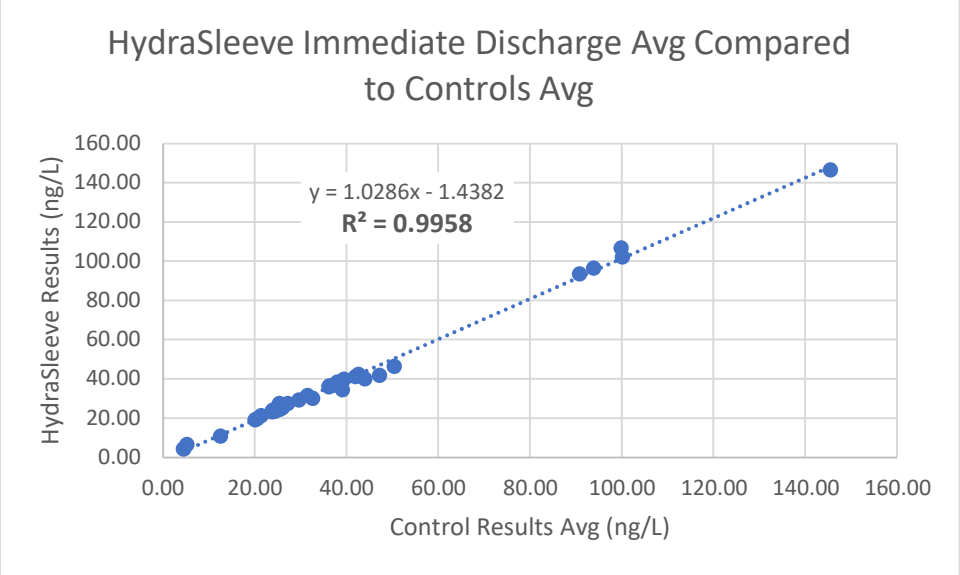


Figure 5: Scatter plot showing the average for 4 immediate-discharge HydraSleeve Samples compared to the average for the 2 Control samples each of the 38 PFAS detected in the study. (Section 4.3)

5. Conclusions

The study shows that HDPE HydraSleeves and manufacturer-provided suspension tether components do not leach PFAS into samples acquired using the HydraSleeve and therefore do not bias samples high, even at low-concentration, single-digit ng/L (parts per trillion), for the 40 PFAS analyzed using EPA Method 1633-draft.

The study also shows that HDPE HydraSleeves acquire samples that closely represent the test environment, as determined by their high positive correlations with Control samples taken directly from the test environment. In most cases the results from HydraSleeve samples were within 2-3 ng/L of the average of two Control results. In many cases, the individual PFAS concentrations were within the range of difference to the Control samples as the two Controls were to each other.

The study also demonstrated that allowing samples to reside in HydraSleeves for 20 minutes after sampling did not cause a noticeable change in concentration from HydraSleeves sampled within 5-minutes of sampling. This demonstrates that HDPE HydraSleeves do not adsorb PFAS from samples between the time of acquisition and discharge to sample bottles, even if the discharge is delayed for 20 minutes, and therefore do not bias samples low.

The test data demonstrates that sampling for PFAS using HydraSleeves produces samples with PFAS concentrations that are statistically representative of concentrations in water surrounding the sampler.

6. Reference

The Standard Operating Procedure for the HydraSleeve, including the HDPE “SuperSleeve” for PFAS and all other standard configurations and variations, can be found at https://www.eonpro.com/wp-content/uploads/2023/04/HydraSleeve-SOP-2.0-2023-1.pdf.

APPENDIX A: Rinsate & Soak Test Data

The entire data-set from the rinsate and soak tests are shown in the table below in ng/L (ppt). Each of the 40 tested PFAS is labeled in the left-hand column, and the results for that PFAS from individual tests are shown across the same row. Rinsate sample IDs (blue headers), tether soak sample IDs (green header), and the Control sample ID of the laboratory produced, PFAS-Free deionized water (gray header), are shown in the column headings. Results below the Method Detection Limit (MDL) are "Non-Detect" results and listed as "ND" in the table. The lab MDL and RL shown in Table 1 are the maximum of the five tests for each PFAS. Reading across each row facilitates comparing the HydraSleeve test results directly with the Control results.

Table of Rinsate and Soak Results	**HDPE HydraSleeve Rinsate Test (ng/L)**			**Tether Components 1-Hour Soak Test (ng/L)**	**Rinsate & Soak Control (ng/L)**	**Lab MDL* (ng/L)**	**Lab Reporting Limit* (ng/L)**
Sample ID> PFAS Analyte	10M8016	10M8026	10M8036	10M8146	10MC8046	MDL	RL
11Cl-PF3OUdS	ND	ND	ND	ND	ND	1.96	6.08
3:3 FTCA	ND	ND	ND	ND	ND	1.60	8.11
4:2 FTS	ND	ND	ND	ND	ND	1.29	6.08
5:3 FTCA	ND	ND	ND	ND	ND	6.86	40.50
6:2 FTS	ND	ND	ND	ND	ND	1.24	6.15
7:3 FTCA	ND	ND	ND	ND	ND	3.64	40.50
8:2 FTS	ND	ND	ND	ND	ND	1.90	6.22
9Cl-PF3ONS	ND	ND	ND	ND	ND	1.95	6.32
ADONA	ND	ND	ND	ND	ND	1.61	6.40
EtFOSA	ND	ND	ND	ND	ND	0.99	1.62
EtFOSAA	ND	ND	ND	ND	ND	0.70	1.62
EtFOSE	ND	ND	ND	ND	ND	2.58	16.20
HFPO-DA	ND	ND	ND	ND	ND	1.72	6.77
MeFOSA	ND	ND	ND	ND	ND	1.02	1.62
MeFOSAA	ND	ND	ND	ND	ND	0.70	1.62
MeFOSE	ND	ND	ND	ND	ND	2.63	16.20
NFDHA	ND	ND	ND	ND	ND	1.57	3.24
PFBA	ND	ND	ND	ND	ND	1.62	6.49
PFBS	ND	ND	ND	ND	ND	0.68	1.44
PFDA	ND	ND	ND	ND	ND	0.43	1.62
PFDoA	ND	ND	ND	ND	ND	0.23	1.62
PFDoS	ND	ND	ND	ND	ND	0.50	1.57

Table of Rinsate and Soak Results Continued Below

Sample ID> PFAS Analyte	10M8016	10M8026	10M8036	10M8146	10MC8046	MDL	RL
PFDS	ND	ND	ND	ND	ND	0.57	1.56
PFEESA	ND	ND	ND	ND	ND	0.38	2.89
PFHpA	ND	ND	ND	ND	ND	0.28	1.62
PFHpS	ND	ND	ND	ND	ND	0.38	1.54
PFHxA	ND	ND	ND	ND	ND	0.28	1.62
PFHxS	ND	ND	ND	ND	ND	0.51	1.48
PFMBA	ND	ND	ND	ND	ND	0.46	3.24
PFMPA	ND	ND	ND	ND	ND	0.69	3.24
PFNA	ND	ND	ND	ND	ND	0.25	1.62
PFNS	ND	ND	ND	ND	ND	0.61	1.56
PFOA	ND	ND	ND	ND	ND	1.80	2.03
PFOS	ND	ND	ND	ND	ND	1.19	1.51
PFOSA	ND	ND	ND	ND	ND	0.40	1.62
PFPeA	ND	ND	ND	ND	ND	0.43	3.24
PFPeS	ND	ND	ND	ND	ND	0.49	1.52
PFTeDA	ND	ND	ND	ND	ND	0.24	1.62
PFTrDA	ND	ND	ND	ND	ND	0.26	1.62
PFUnA	ND	ND	ND	ND	ND	0.42	1.62

*The Lab MDL and RL shown in Table 1 are the maximum values for each analyte out of the five samples tested by the lab. There were no qualifiers in the data-set.

APPENDIX B: Descriptive Statistics for Comparative Study

Descriptive Statistics and Sample Characteristics for Comparison Test Data (ng/L)							
	Total Data for all 8 Samples (HydraSleeves + Controls) for Each PFAS				HydraSleeve Sample Data (*n*= 6)		Control Sample Data (*n*= 2)
PFAS Analyte	**Mean (ng/L)**	**Std. Deviation (ng/L)**	**Min. (ng/L)**	**Max (ng/L)**	**HS Mean (ng/L)**	**HS Std. Deviation (ng/L)**	**Control Mean (ng/L)**
11Cl-PF3OUdS	23.90	3.26	20.00	29.00	23.47	3.22	25.20
3:3 FTCA	39.84	10.94	*15.5	51.20	42.67	5.35	**31.35
4:2 FTS	103.59	4.24	96.70	109.00	104.83	3.71	99.85
6:2 FTS	91.96	2.90	89.00	97.70	92.35	3.28	90.80
7:3 FTCA	7.06	2.76	4.30	11.40	6.55	2.65	10.10
8:2 FTS	94.71	5.24	87.80	103.00	95.00	6.11	93.85
9Cl-PF3ONS	30.29	2.34	27.10	34.60	29.52	1.80	32.60
ADONA	20.99	1.07	20.00	22.70	20.85	0.91	21.40
EtFOSA	4.32	0.92	3.32	5.87	4.23	0.70	4.60
EtFOSAA	34.94	3.04	30.30	39.90	33.55	1.86	39.10
EtFOSE	10.96	1.24	9.50	13.60	10.43	0.60	12.55
MeFOSA	5.96	1.36	3.59	8.35	6.22	1.12	5.19
MeFOSAA	47.16	2.53	43.60	51.20	46.08	1.77	50.40
MeFOSE	4.14	1.16	2.92	6.54	4.09	1.26	4.41
NFDHA	25.51	1.09	23.10	26.70	25.32	1.15	26.10
PFBA	145.63	4.69	141.00	155.00	145.67	5.32	145.50
PFBS	26.58	1.42	24.90	29.70	26.97	1.40	25.40
PFDA	35.39	2.07	33.30	38.00	35.13	2.08	36.15
PFDoA	40.93	3.26	35.50	45.00	40.58	3.25	41.95
PFDoS	19.21	2.54	15.70	23.60	18.92	1.92	20.10
PFDS	23.10	2.81	19.30	27.20	22.87	2.59	23.80
PFEESA	27.18	1.30	25.40	29.30	27.17	1.43	27.20
PFHpA	41.96	1.27	40.50	44.20	41.75	1.37	42.60
PFHpS	25.46	1.34	23.90	27.40	25.37	1.54	25.75
PFHxA	38.56	1.73	36.00	40.80	38.75	1.93	38.00
PFHxS	23.74	0.96	22.70	25.20	23.68	1.10	23.90
PFMBA	24.64	0.76	23.70	26.10	24.68	0.89	24.50
PFMPA	23.46	1.19	21.30	24.60	23.15	1.22	24.40
PFNA	39.35	1.89	36.90	42.60	39.32	2.04	39.45
PFNS	19.79	1.87	17.30	22.60	19.53	1.71	20.55
PFOA	36.19	1.19	35.10	38.40	36.17	1.21	36.25
PFOS	24.55	1.08	22.90	26.00	24.48	1.22	24.75
PFOSA	41.05	2.78	35.40	44.00	40.07	2.49	44.00
PFPeA	102.78	7.11	89.90	112.00	103.65	7.59	100.15
PFPeS	24.74	1.05	23.10	26.40	24.47	0.95	25.55
PFTeDA	28.78	2.09	26.60	32.00	28.50	1.86	29.60
PFTrDA	31.01	2.24	27.70	33.60	30.85	2.37	31.50
PFUnA	35.91	3.08	32.20	41.30	35.50	3.25	37.15

*3:3 FTCA Minimum value of 15.5 ng/L from 1 Control sample is considered an outlier but is included in calculating the Control mean **31.35 ng/L.

ATTACHMENT B

EXCERPTS FROM GF's JANUARY 2025 *PFAS INVESTIGATION & MONITORING REPORT*

GANNETT FLEMING

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 1

GROUNDWATER ELEVATIONS (JUNE 2021 THROUGH MAY 2024)

Well ID	WDNR Well ID	Reference Elevation (ft MSL)	June 2021		October 2021		May 2022		October 2022		May 2023		September 2023		May 2024	
			Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)
W-1	100	893.58	2.69	890.89	2.20	891.38	2.51	891.07	2.77	890.81	2.32	891.26	3.70	889.88	2.55	891.03
W-1A	103	893.68	21.33	872.35	19.82	873.86	19.17	874.51	20.19	873.49	18.82	874.86	20.28	873.40	19.98	873.70
W-1D	109	895.00	22.46	872.54	20.75	874.25	20.70	874.30	20.40	874.60	19.57	875.43	21.24	873.76	11.90	883.10
W-2	112	899.21	13.68	885.53	12.46	886.75	12.08	887.13	13.35	885.86	11.37	887.84	13.90	885.31	13.00	886.21
W-2A	115	900.17	27.18	872.99	26.70	873.47	26.67	873.50	27.26	872.91	26.43	873.74	27.60	872.57	27.00	873.17
W-2B	118	900.03	18.33	881.70	16.69	883.34	17.30	882.73	17.85	882.18	16.79	883.24	18.20	881.83	18.03	882.00
W-3	121	902.22	13.50	888.72	12.86	889.36	11.90	890.32	14.00	888.22	12.39	889.83	14.81	887.41	15.76	886.46
W-3A	124	903.79	29.47	874.32	29.34	874.45	29.31	874.48	29.50	874.29	29.00	874.79	30.15	873.64	29.82	873.97
W-3B	127	904.14	18.30	885.84	16.96	887.18	17.38	886.76	26.70	877.44	17.05	887.09	18.34	885.80	18.13	886.01
W-4	130	903.20	16.83	886.37	15.52	887.68	15.70	887.50	17.45	885.75	15.34	887.86	17.60	885.60	17.24	885.96
W-5	133	899.47	10.46	889.01	10.19	889.28	9.82	889.65	11.30	888.17	10.24	889.23	12.58	886.89	10.43	889.04
W-6	136	900.88	14.20	886.68	13.25	887.63	13.40	887.48	14.00	886.88	13.47	887.41	14.90	885.98	14.15	886.73
W-7	139	904.18	18.39	885.79	16.93	887.25	17.11	887.07	18.08	886.10	17.11	887.07	19.23	884.95	18.68	885.50
W-7A	142	905.33	22.20	883.13	19.69	885.64	20.06	885.27	21.21	884.12	20.17	885.16	21.66	883.67	21.31	884.02
W-17	169	891.97	14.15	877.82	11.65	880.32	9.40	882.57	12.63	879.34	8.26	883.71	13.55	878.42	10.95	881.02
W-17A	172	890.11	34.77	855.34	34.76	855.35	34.29	855.82	35.01	855.10	33.43	856.68	35.05	855.06	35.31	854.80
W-17B	175	890.38	30.89	859.49	30.95	859.43	30.07	860.31	31.26	859.12	29.60	860.78	31.48	858.90	31.48	858.90
W-18	178	890.69	2.67	888.02	4.98	885.71	2.78	887.91	6.00	884.69	3.47	887.22	7.33	883.36	3.41	887.28
W-18A	181	890.82	24.96	865.86	24.64	866.18	23.87	866.95	25.06	865.76	23.32	867.50	24.84	865.98	24.27	866.55
W-19R	185	892.30	23.59	868.71	23.00	869.30	22.46	869.84	23.29	869.01	21.67	870.63	22.10	870.20	22.60	869.70
W-26	205	892.37	29.91	862.46	30.20	862.17	28.74	863.63	30.92	861.45	28.41	863.96	30.45	861.92	29.85	862.52
W-27	208	888.86	36.27	852.59	36.35	852.51	35.51	853.35	36.39	852.47	35.08	853.78	36.23	852.63	35.62	853.24
W-28	211	893.36	7.31	886.05	6.85	886.51	5.55	887.81	7.69	885.67	5.56	887.80	8.55	884.81	6.48	886.88
W-29	214	892.26	6.78	885.48	6.84	885.42	4.84	887.42	8.67	883.59	5.23	887.03	9.68	882.58	5.78	886.48
W-30A	217	875.57	NM	NM	21.66	853.91	21.05	854.52	22.53	853.04	20.77	854.80	21.81	853.76	21.33	854.24
W-30B	220	876.33	NM	NM	20.41	855.92	19.84	856.49	20.59	855.74	19.54	856.79	20.68	855.65	21.60	854.73
W-31A	223	902.86	22.64	880.22	NM	NM	21.22	881.64	21.20	881.66	20.20	882.66	21.40	881.46	20.78	882.08
W-31B	226	902.94	29.93	873.01	NM	NM	21.30	881.64	25.90	877.04	23.50	879.44	24.90	878.04	23.90	879.04
W-32	788	899.36	15.79	883.57	14.60	884.76	14.90	884.46	15.40	883.96	14.13	885.23	15.87	883.49	14.13	885.23

GANNETT FLEMING

TABLE 1

GROUNDWATER ELEVATIONS (JUNE 2021 THROUGH MAY 2024)

Well ID	WDNR Well ID	Reference Elevation (ft MSL)	June 2021		October 2021		May 2022		October 2022		May 2023		September 2023		May 2024	
			Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)	Depth to Water (ft)	GW Elevation (ft MSL)
W-33	787	901.26	12.40	888.86	11.68	889.58	11.56	889.70	12.42	888.84	11.22	890.04	13.29	887.97	15.65	885.61
W-34	592	904.41	19.18	885.23	17.98	886.43	18.89	885.52	18.70	885.71	18.24	886.17	19.21	885.20	19.43	884.98
W-35	NA	904.19	18.38	885.81	17.29	886.90	17.84	886.35	18.22	885.97	17.43	886.76	18.90	885.29	18.59	885.60
MW-104	318	890.46	12.19	878.27	10.92	879.54	8.90	881.56	11.87	878.59	8.83	881.63	12.72	877.74	9.90	880.56
MW-104A	321	890.74	32.71	858.03	32.35	858.39	31.29	859.45	32.75	857.99	30.85	859.89	32.85	857.89	31.89	858.85
MW-106	330	892.88	9.76	883.12	9.24	883.64	7.54	885.34	9.99	882.89	7.51	885.37	10.63	882.25	8.50	884.38
MW-106A	333	892.89	26.35	866.54	25.68	867.21	24.95	867.94	26.13	866.76	24.45	868.44	26.43	866.46	25.63	867.26
MW-111	357	888.11	41.65	846.46	42.25	845.86	41.52	846.59	41.88	846.23	41.30	846.81	41.82	846.29	42.10	846.01
MW-111A	360	888.24	41.50	846.74	41.50	846.74	41.41	846.83	41.84	846.40	41.19	847.05	41.70	846.54	41.44	846.80
MW-111B	363	888.07	38.50	849.57	38.76	849.31	38.31	849.76	38.74	849.33	38.05	850.02	38.78	849.29	38.50	849.57
MW-112	366	886.26	35.71	850.55	35.95	850.31	35.42	850.84	36.00	850.26	35.13	851.13	35.89	850.37	35.60	850.66
MW-112A	369	886.08	35.51	850.57	35.79	850.29	35.26	850.82	35.63	850.45	34.96	851.12	35.74	850.34	35.50	850.58
MW-112B	372	886.29	35.50	850.79	35.74	850.55	35.22	851.07	35.75	850.54	34.95	851.34	35.76	850.53	35.40	850.89
MW-113	375	890.59	41.28	849.31	41.75	848.84	41.22	849.37	41.71	848.88	41.07	849.52	41.64	848.95	41.42	849.17
MW-113A	378	890.83	41.46	849.37	41.90	848.93	41.38	849.45	41.86	848.97	41.26	849.57	41.84	848.99	45.90	844.93
MW-113B	381	890.81	40.86	849.95	41.23	849.58	40.75	850.06	41.22	849.59	40.65	850.16	41.20	849.61	NM	NM
MW-114	384	890.15	30.81	859.34	30.66	859.49	29.95	860.20	31.08	859.07	29.22	860.93	31.02	859.13	30.70	859.45
MW-114A	387	889.95	33.67	856.28	33.72	856.23	33.26	856.69	33.96	855.99	32.79	857.16	33.97	855.98	34.10	855.85
MW-114B	390	890.01	33.35	856.66	33.38	856.63	33.07	856.94	NM	NM	NM	NM	NM	NM	NM	NM
MW-115	393	889.14	36.57	852.57	36.60	852.54	36.03	853.11	36.65	852.49	35.78	853.36	36.65	852.49	36.22	852.92
MW-115A	396	888.42	35.78	852.64	35.95	852.47	35.39	853.03	36.02	852.40	35.12	853.30	36.05	852.37	35.66	852.76
MW-115B	399	888.54	35.71	852.83	35.86	852.68	35.38	853.16	35.91	852.63	35.12	853.42	35.96	852.58	35.62	852.92
MW-116	402	889.80	7.19	882.61	6.47	883.33	4.02	885.78	7.99	881.81	4.55	885.25	9.6	880.20	5.25	884.55
RW-2	NA	905.31	18.31	887.00	18.61	886.70	NM	NM	20.29	885.02	19.90	885.41	NM	NM	21.40	883.91
RW-5	512	903.75	17.94	885.81	16.92	886.83	17.60	886.15	17.69	886.06	17.22	886.53	NM	NM	NM	NM
TW-1	NA	899.14	11.28	887.86	10.72	888.42	10.30	888.84	11.51	887.63	11.52	887.62	13.25	885.89	6.03	893.11

NOTES:
NA = Not applicable.
NM = Not measured.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 2

MEASURED VERTICAL GRADIENTS (JUNE 2021 THROUGH MAY 2024)

Well ID	Top of Casing Elevation (ft MSL)	Top of Screened Interval (ft MSL)	Bottom of Screened Interval (ft MSL)	June 2021			October 2021			May 2022			October 2022		
				Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)	Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)	Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)	Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)
W-1	893.58	890.24	885.24	2.69	890.89		2.20	891.38		2.51	891.07		2.77	890.81	
W-1A	893.68	855.64	852.64	21.33	872.35	(0.5518)	19.82	873.86	(0.5214)	19.17	874.51	(0.4929)	20.19	873.49	(0.5155)
W-1D	895.00	849.64	844.64	22.46	872.54	(0.4520)	20.75	874.25	(0.4219)	20.70	874.30	(0.4131)	20.40	874.60	(0.3993)
W-2	899.21	889.52	884.52	13.68	885.53		12.46	886.75		12.08	887.13		13.35	885.86	
W-2B	900.03	847.92	842.92	18.33	881.70	(0.0967)	16.69	883.34	(0.0848)	17.30	882.73	(0.1089)	27.26	872.77	(0.3291)
W-2A	900.17	793.02	788.02	27.18	872.99	(0.1587)	26.70	873.47	(0.1798)	26.67	873.50	(0.1681)	17.85	882.32	0.1740
W-3	902.22	891.66	886.66	13.50	888.72		12.86	889.36		11.90	890.32		14.00	888.22	
W-3B	904.14	846.16	841.16	18.30	885.84	(0.0654)	16.96	887.18	(0.0492)	17.38	886.76	(0.0794)	29.50	874.64	(0.3102)
W-3A	903.79	794.86	789.86	29.47	874.32	(0.2246)	29.34	874.45	(0.2481)	29.31	874.48	(0.2394)	26.70	877.09	0.0478
W-7	904.18	888.03	878.03	18.39	885.79		16.93	887.25		17.11	887.07		18.08	886.10	
W-7A	905.33	873.03	868.03	22.20	883.13	(0.2337)	19.69	885.64	(0.1329)	20.06	885.27	(0.1498)	21.21	884.12	(0.1717)
W-17	891.97	886.12	875.32	14.15	877.82		11.65	880.32		9.40	882.57		12.63	879.34	
W-17B	890.38	844.32	839.32	30.89	859.49	(0.5275)	30.95	859.43	(0.5803)	30.07	860.31	(0.5996)	35.01	855.37	(0.6750)
W-17A	890.11	793.32	788.32	34.77	855.34	(0.0814)	34.76	855.35	(0.0800)	34.29	855.82	(0.0880)	31.26	858.85	0.0682
W-18	890.69	884.74	874.74	2.67	888.02		4.98	885.71		2.78	887.91		6.00	884.69	
W-18A	890.82	838.24	833.24	24.96	865.86	(0.5036)	24.64	866.18	(0.4439)	23.87	866.95	(0.4764)	25.06	865.76	(0.4305)
W-30A	875.57	762.07	757.07	NM	NM		21.66	853.91		21.05	854.52		22.53	853.04	
W-30B	876.33	749.33	744.33	NM	NM	NM	20.41	855.92	0.1578	19.84	856.49	0.1546	20.59	855.74	0.2119
W-31A	902.86	860.16	855.16	22.64	880.22		NM	NM		21.22	881.64		21.20	881.66	
W-31B	902.94	839.64	834.64	29.93	873.01	(0.3514)	NM	NM	NM	21.30	881.64	0.0000	25.90	877.04	(0.2251)
MW-104	890.46	878.68	873.68	12.19	878.27		10.92	879.54		8.90	881.56		11.87	878.59	
MW-104A	890.74	853.18	848.18	32.71	858.03	(0.8002)	32.35	858.39	(0.8294)	31.29	859.45	(0.8671)	32.75	857.99	(0.8093)
MW-106	892.88	880.96	875.96	9.76	883.12		9.24	883.64		7.54	885.34		9.99	882.89	
MW-106A	892.89	853.96	848.96	26.35	866.54	(0.6141)	25.68	867.21	(0.6085)	24.95	867.94	(0.6444)	26.13	866.76	(0.5974)
MW-111	888.11	850.59	840.59	41.65	846.46		42.25	845.86		41.52	846.59		41.88	846.23	
MW-111A	888.24	820.59	815.59	41.50	846.74	0.0110	41.50	846.74	0.0350	41.41	846.83	0.0094	41.84	846.40	0.0067
MW-111B	888.07	790.51	785.51	38.50	849.57	0.0941	38.76	849.31	0.0854	38.31	849.76	0.0974	38.74	849.33	0.0974
MW-112	886.26	853.88	843.88	35.71	850.55		35.95	850.31		35.42	850.84		36.00	850.26	
MW-112A	886.08	828.43	823.43	35.51	850.57	0.0009	35.79	850.29	(0.0009)	35.26	850.82	(0.0009)	35.63	850.45	0.0090
MW-112B	886.29	798.87	793.87	35.50	850.79	0.0074	35.74	850.55	0.0088	35.22	851.07	0.0085	35.75	850.54	0.0030
MW-113	890.59	852.21	842.21	41.28	849.31		41.75	848.84		41.22	849.37		41.71	848.88	
MW-113A	890.83	823.14	818.14	41.46	849.37	0.0024	41.90	848.93	0.0036	41.38	849.45	0.0032	41.86	848.97	0.0036
MW-113B	890.81	793.36	788.36	40.86	849.95	0.0195	41.23	849.58	0.0218	40.75	850.06	0.0205	41.22	849.59	0.0208
MW-114	890.15	861.70	846.70	30.81	859.34		30.66	859.49		29.95	860.20		31.08	859.07	
MW-114A	889.95	787.25	782.25	33.67	856.28	(0.0448)	33.72	856.23	(0.0477)	33.26	856.69	(0.0511)	33.96	855.99	(0.0452)
MW-114B	890.01	751.51	746.51	33.35	856.66	0.0106	33.38	856.63	0.0112	33.07	856.94	0.0070	NM	NM	NM
MW-115	889.14	795.44	790.44	36.57	852.57		36.60	852.54		36.03	853.11		36.65	852.49	
MW-115A	888.42	775.80	770.80	35.78	852.64	0.0036	35.95	852.47	(0.0036)	35.39	853.03	(0.0041)	36.02	852.40	(0.0046)
MW-115B	888.54	745.94	740.94	35.71	852.83	0.0064	35.86	852.68	0.0070	35.38	853.16	0.0044	35.91	852.63	0.0077

GANNETT FLEMING

TABLE 2

MEASURED VERTICAL GRADIENTS - CONTINUED (JUNE 2021 THROUGH MAY 2024)

Well ID	Top of Casing Elevation (ft MSL)	Top of Screened Interval (ft MSL)	Bottom of Screened Interval (ft MSL)	May 2023			September 2023			May 2024		
				Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)	Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)	Depth to Water (ft)	GW Elevation (ft MSL)	Vertical Gradient (ft/ft)
W-1	893.58	890.24	885.24	2.32	891.26		3.70	889.88		2.55	891.03	
W-1A	893.68	855.64	852.64	18.82	874.86	(0.4881)	20.28	873.40	(0.4931)	19.98	873.70	(0.5158)
W-1D	895.00	849.64	844.64	19.57	875.43	(0.3899)	21.24	873.76	(0.3988)	11.90	883.10	(0.1953)
W-2	899.21	889.52	884.52	11.37	887.84		13.90	885.31		13.00	886.21	
W-2B	900.03	847.92	842.92	16.79	883.24	(0.1129)	18.20	881.83	(0.0881)	18.03	882.00	(0.1054)
W-2A	900.17	793.02	788.02	26.43	873.74	(0.1730)	27.60	872.57	(0.1687)	27.00	873.17	(0.1608)
W-3	902.22	891.66	886.66	12.39	889.83		14.81	887.41		15.76	886.46	
W-3B	904.14	846.16	841.16	17.05	887.09	(0.0615)	18.34	885.80	(0.0371)	18.13	886.01	(0.0105)
W-3A	903.79	794.86	789.86	29	874.79	(0.2398)	30.15	873.64	(0.2370)	29.82	873.97	(0.2347)
W-7	904.18	888.03	878.03	17.11	887.07		19.23	884.95		18.68	885.50	
W-7A	905.33	873.03	868.03	20.17	885.16	(0.1589)	21.66	883.67	(0.1168)	21.31	884.02	(0.1317)
W-17	891.97	886.12	875.32	8.26	883.71		13.55	878.42		10.95	881.02	
W-17B	890.38	844.32	839.32	29.60	860.78	(0.6083)	31.48	858.90	(0.5569)	31.48	858.90	(0.6085)
W-17A	890.11	793.32	788.32	33.43	856.68	(0.0804)	35.05	855.06	(0.0753)	35.31	854.80	(0.0804)
W-18	890.69	884.74	874.74	3.47	887.22		7.33	883.36		3.41	887.28	
W-18A	890.82	838.24	833.24	23.32	867.50	(0.4482)	24.84	865.98	(0.4013)	24.27	866.55	(0.4711)
W-30A	875.57	762.07	757.07	20.77	854.80		21.81	853.76		21.33	854.24	
W-30B	876.33	749.33	744.33	19.54	856.79	0.1562	20.68	855.65	0.1484	21.60	854.73	0.0385
W-31A	902.86	860.16	855.16	20.20	882.66		21.40	881.46		20.78	882.08	
W-31B	902.94	839.64	834.64	23.50	879.44	(0.1569)	24.90	878.04	(0.1667)	23.90	879.04	(0.1481)
MW-104	890.46	878.68	873.68	8.83	881.63		12.72	877.74		9.90	880.56	
MW-104A	890.74	853.18	848.18	30.85	859.89	(0.8525)	32.85	857.89	(0.7930)	31.89	858.85	(0.8514)
MW-106	892.88	880.96	875.96	7.51	885.37		10.63	882.25		8.50	884.38	
MW-106A	892.89	853.96	848.96	24.45	868.44	(0.6270)	26.43	866.46	(0.5848)	25.63	867.26	(0.6341)
MW-111	888.11	850.59	840.59	41.30	846.81		41.82	846.29		42.10	846.01	
MW-111A	888.24	820.59	815.59	41.19	847.05	0.0094	41.70	846.54	0.0099	41.44	846.80	0.0313
MW-111B	888.07	790.51	785.51	38.05	850.02	0.0987	38.78	849.29	0.0914	38.50	849.57	0.0921
MW-112	886.26	853.88	843.88	35.13	851.13		35.89	850.37		35.60	850.66	
MW-112A	886.08	828.43	823.43	34.96	851.12	(0.0005)	35.74	850.34	(0.0014)	35.50	850.58	(0.0037)
MW-112B	886.29	798.87	793.87	34.95	851.34	0.0074	35.76	850.53	0.0064	35.40	850.89	0.0105
MW-113	890.59	852.21	842.21	41.07	849.52		41.64	848.95		41.42	849.17	
MW-113A	890.83	823.14	818.14	41.26	849.57	0.0020	41.84	848.99	0.0016	45.90	844.93	(0.1693)
MW-113B	890.81	793.36	788.36	40.65	850.16	0.0198	41.20	849.61	0.0208	NM	NM	NM
MW-114	890.15	861.70	846.70	29.22	860.93		31.02	859.13		30.70	859.45	
MW-114A	889.95	787.25	782.25	32.79	857.16	(0.0546)	33.97	855.98	(0.0462)	34.10	855.85	(0.0527)
MW-114B	890.01	751.51	746.51	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-115	889.14	795.44	790.44	35.78	853.36		36.65	852.49		36.22	852.92	
MW-115A	888.42	775.80	770.80	35.12	853.30	(0.0031)	36.05	852.37	(0.0061)	35.66	852.76	(0.0081)
MW-115B	888.54	745.94	740.94	35.12	853.42	0.0040	35.96	852.58	0.0070	35.62	852.92	0.0054

NOTES:

Site datum = feet above mean sea level (ft MSL).

Negative/downward calculated vertical gradients are enclosed in parenthesis and (red).

Top of casing & ground surface elevations for W-1 thru W-29 and MW-101 thru MW-110 taken from ECG Inc.'s 05/02/96 "Site Plan-Waste Research and Reclamation" showing revised monitoring well elevations.

Top of casing elevation for W-30A, W-30B, MW-103, and MW-103A from WRR level survey conducted 9/19/07.

Top of casing and ground surface elevations for W-111 through MW-113B based on table with groundwater monitoring well information prepared by SEH dated Jan 14, 2005.

Top of casing elevations for well nests MW-113 through MW-115 and well MW-116 based on SEH survey conducted in May 2010.

NM = Not measured.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 3

SUMMARY OF PFAS DETECTED IN PRIVATE WELL SAMPLES (JULY - SEPTEMBER 2021)

Detected PFAS Compounds[1]	# of Carbon Atoms	CAS Number	PW-1[2] Conc. (ng/ℓ)	PW-1[2] HQ/HI[5] (Unitless)	PW-2[3] Conc. (ng/ℓ)	PW-2[3] HQ/HI[5] (Unitless)	PW-3[2] Conc. (ng/ℓ)	PW-3[2] HQ/HI[5] (Unitless)	WDHS Recommended NR 140 ES (ng/ℓ)	WDHS Recommended NR 140 PAL (ng/ℓ)
PFBA	4	375-22-4	<2.6	0	<2.3	0	<2.5	0	**10,000**	*2,000*
PFBS	4	375-73-5	0.46 J	<0.0001	<0.31	0	0.44 J	<0.0001	**450,000**	*90,000*
PFHxS	6	335-45-4	0.43 J	0.011	<0.33	0	<0.35	0	**40**	*4*
PFHpA	7	375-85-9	0.55 J	NA	<0.39	NA	<0.42	NA	NRS	NRS
PFOA	8	335-67-1	0.76 J	0.038	<0.56	0	<0.60	0	**20[C1]**	*2 [C1]*
PFOSA	8	754-91-6	<0.71	0	0.66 J	0.033	<0.68	0	**20[C2]**	*2 [C2]*
		Totals[6]	**2.20**	**0.049**	**0.66**	**0.033**	**0.44**	**0**	**HI <1**	

Detected PFAS Compounds[1]	# of Carbon Atoms	CAS Number	PW-4[2] Conc. (ng/ℓ)	PW-4[2] HQ/HI[5] (Unitless)	PW-7[2] Conc. (ng/ℓ)	PW-7[2] HQ/HI[5] (Unitless)	PW-8[2] Conc. (ng/ℓ)	PW-8[2] HQ/HI[5] (Unitless)	WDHS Recommended NR 140 ES (ng/ℓ)	WDHS Recommended NR 140 PAL (ng/ℓ)
PFBA	4	375-22-4	<2.6	0	<2.5	0	<2.6	0	**10,000**	*2,000*
PFBS	4	375-73-5	<0.35	0	<0.34	0	<0.35	0	**450,000**	*90,000*
PFHxS	6	335-45-4	0.51 J	0.013	<0.35	0	<0.37	0	**40**	*4*
PFHpA	7	375-85-9	<0.43	NA	<0.54	NA	<0.44	NA	NRS	NRS
PFOA	8	335-67-1	<0.62	0	<0.60	0	<0.63	0	**20[C1]**	*2 [C1]*
PFOSA	8	754-91-6	<0.70	0	<0.68	0	<0.71	0	**20[C2]**	*2 [C2]*
		Totals[6]	**0.51**	**0.013**	**0**	**0**	**0**	**0**	**HI <1**	

Detected PFAS Compounds[1]	# of Carbon Atoms	CAS Number	PW-9[4] Conc. (ng/ℓ)	PW-9[4] HQ/HI[5] (Unitless)	PW-10[3] Conc. (ng/ℓ)	PW-10[3] HQ/HI[5] (Unitless)	PW-11[3] Conc. (ng/ℓ)	PW-11[3] HQ/HI[5] (Unitless)	WDHS Recommended NR 140 ES (ng/ℓ)	WDHS Recommended NR 140 PAL (ng/ℓ)
PFBA	4	375-22-4	<2.5	0	<2.5	0	<2.4	0	**10,000**	*2,000*
PFBS	4	375-73-5	<0.33	0	<0.33	0	<0.33	0	**450,000**	*90,000*
PFHxS	6	335-45-4	<0.35	0	<0.35	0	<0.34	0	**40**	*4*
PFHpA	7	375-85-9	<0.42	NA	<0.42	NA	<0.41	NA	NRS	NRS
PFOA	8	335-67-1	<0.60	0	<0.59	0	<0.59	0	**20[C1]**	*2 [C1]*
PFOSA	8	754-91-6	<0.68	0	<0.67	0	<0.66	0	**20[C2]**	*2 [C2]*
		Totals[6]	**0**	**0**	**0**	**0**	**0**	**0**	**HI <1**	

GANNETT FLEMING

TABLE 3

SUMMARY OF PFAS DETECTED IN PRIVATE WELL SAMPLES (JULY - SEPTEMBER 2021)

Detected PFAS Compounds[1]	# of Carbon Atoms	CAS Number	PW-12[4] Conc. (ng/ℓ)	PW-12[4] HQ/HI[5] (Unitless)	PW-13[3] Conc. (ng/ℓ)	PW-13[3] HQ/HI[5] (Unitless)	PW-14[2] Conc. (ng/ℓ)	PW-14[2] HQ/HI[5] (Unitless)	WDHS Recommended NR 140 ES (ng/ℓ)	WDHS Recommended NR 140 PAL (ng/ℓ)
PFBA	4	375-22-4	2.6 J	0.00026	<2.3	0	<2.8	0	**10,000**	*2,000*
PFBS	4	375-73-5	<0.35	0	<0.31	0	<0.37	0	**450,000**	*90,000*
PFHxS	6	335-45-4	<0.37	0	<0.33	0	<0.39	0	**40**	*4*
PFHpA	7	375-85-9	<0.44	NA	<0.39	NA	<0.47	NA	NRS	NRS
PFOA	8	335-67-1	<0.63	0	<0.56	0	<0.67	0	**20[C1]**	*2 [C1]*
PFOSA	8	754-91-6	<0.71	0	<0.63	0	<0.76	0	**20[C2]**	*2 [C2]*
		Totals[6]	**2.6**	**0.00026**	**0**	**0**	**0**	**0**	**HI <1**	

Detected PFAS Compounds[1]	# of Carbon Atoms	CAS Number	PW-15[2] Conc. (ng/ℓ)	PW-15[2] HQ/HI[5] (Unitless)	PW-16[3] Conc. (ng/ℓ)	PW-16[3] HQ/HI[5] (Unitless)	PW-17[4] Conc. (ng/ℓ)	PW-17[4] HQ/HI[5] (Unitless)	WDHS Recommended NR 140 ES (ng/ℓ)	WDHS Recommended NR 140 PAL (ng/ℓ)
PFBA	4	375-22-4	<2.5	0	<2.3	0	2.8 J	0.00028	**10,000**	*2,000*
PFBS	4	375-73-5	<0.34	0	<0.31	0	<0.37	0	**450,000**	*90,000*
PFHxS	6	335-45-4	<0.36	0	<0.33	0	<0.38	0	**40**	*4*
PFHpA	7	375-85-9	<0.43	NA	<0.39	NA	<0.46	NA	NRS	NRS
PFOA	8	335-67-1	<0.61	0	<0.56	0	<0.66	0	**20[C1]**	*2 [C1]*
PFOSA	8	754-91-6	<0.69	0	<0.63	0	<0.74	0	**20[C2]**	*2 [C2]*
		Totals[6]	**0**	**0**	**0**	**0**	**2.8**	**0.00028**	**HI <1**	

NOTES:

Concentrations are in nanograms per liter (ng/ℓ)/equivalent to parts per trillion (ppt).

Detected concentrations at or above a proposed NR 140 PAL are italicized; those at or above a proposed NR 140 ES are bold.

Conc. = Concentration in ng/ℓ.

HI = Hazard Index for sample/well (see Footnotes #5 and #6).

HQ = Hazard Quotient for compound (see Footnote #5).

J = Concentration measured between laboratory's method detection limit and quantitation limit.

NA = Not applicable.

NR 140 ES & PAL = Recommended NR 140 enforcement standard (ES) and preventive action limit (PAL) for compound shown.

NRS = No recommended standard in Cycle 11.

C_1 = WI DHS recommends a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOA and PFOS.

C_2 = WI DHS recommends a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE.

FOOTNOTES:

(1) Samples analyzed for PFAS using a modified EPA Method 537. Only compounds detected in one or more samples are shown in this table.

(2) Samples were collected from PW-1, PW-3, PW-4, PW-7, PW-8, PW-14 and PW-15 on July 27, 2021.

(3) Samples were collected from PW-2, PW-10, PW-11, PW-13 and PW-16 on August 13, 2021.

(4) Samples were collected from PW-9, PW-12, and PW-17 on September 1, 2021.

(5) HQ = detected PFAS compound concentration/its proposed NR 140 ES. HI = summation of individual HQs.

(6) Totals include the summation of detected concentrations and the summation of individual HQs (i.e., the HI for each well).

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EAU CLAIRE, WISCONSIN

TABLE 4

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES (ug/kg) - DECEMBER 2022

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs) & Date Collected, and Concentration (µg/kg)						
				PF-1		PF-2				
				1-4'	12-16'	1-4'	4-8'	8-12'	12-16'	16-20'
				12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22
PFAS Compounds with Recommended Groundwater Standards										
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**14**	**4.1**	**8.7**	**2.2**	**1.5**	**0.20 J**	**11**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**18**	**11**	**0.38 J**	**3.3**	**1.8**	0.20 U	**62**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NRS	--	0.36 J	0.24 U	0.25 U	0.26 U	0.24 U	0.25 U	0.29 U
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2	NRS	--	0.99 U	0.97 U	0.99 U	<1.0	<0.95	<0.98	<1.1
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NRS	--	0.67 U	7.2	0.67 U	0.69 U	0.64 U	0.66 U	0.77 U
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	NRS	--	0.25 U	0.25 U	0.25 U	<0.26	<0.24	<0.25	<0.29
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	**0.66 J**	**0.25 J**	0.15 U	0.16 U	0.15 U	0.15 U	**0.28 J**
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	**0.29 J**	**0.34 J**	**0.41 J**	**0.35 J**	**0.36 J**	0.22 U	**1.1 J**
Perfluorodecanoic Acid (PFDA)	335-76-2	**0.000081**	--	**0.72 J**	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.20 U
Hexafluoropropylene oxide dimer acid (HFPO-DA GenX)	13252-13-6	**0.015**	--	0.37 U	**0.41 J**	**0.37 U**	0.38 U	0.35 U	0.36 U	0.42 U
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	NRS	--	0.63 U	0.61 U	0.62 U	<0.64	<0.60	<0.62	<0.72
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	0.28 U	0.28 U	0.28 U	0.29 U	0.27 U	0.28 U	2.60 J
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.66 J	0.15 U	**2.6**	0.17 J	0.15 U	0.19 J	1.6
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	0.38 J	0.12 U	0.46 J	0.13 U	0.25 J	0.20 J	**4.0**
PFAS Compounds without Recommended Groundwater Standards										
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	--	0.39 J	0.12 U	0.17 J	0.13 U	0.12 J	0.12 U	1.10 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	--	0.90 J	0.24 U	1.4	0.25 U	0.23 U	0.24 U	0.49 J
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	--	0.44 U	0.43 U	0.45 J	0.45 U	0.42 U	0.43 U	0.50 U
Total PFAS Concentration				**36**	**23**	**15**	**6.0**	**4.0**	**0.59**	**84**

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TABLE 4

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES (ug/kg) - DECEMBER 2022

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs) & Date Collected, and Concentration (µg/kg)					
				PF-3					
				1-4'	4-6'	6-8'	8-10'	10-12'	12-16'
				12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22
PFAS Compounds with Recommended Groundwater Standards									
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**18**	**280**	**350**	**70**	**16**	**58**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**0.50 J**	**0.70 J**	**0.45 J**	**2.6**	**0.73 J**	**0.89 J**
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.15 U	0.15 U	**0.42 J**	0.15 U	0.16 U	0.15 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	**1.9**	**3.0**	**2.1**	**3.2**	**2.3**	**1.3**
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.40 J	0.16 U	0.16 U	0.24 J	0.35 J	0.55 J
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	0.68 J	0.18 J	0.20 J	1.1	2.8	1.1 J
PFAS Compounds without Recommended Groundwater Standards									
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	--	0.22 J	0.14 J	0.13 U	0.13 J	0.22 J	0.19 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	--	2.3	0.35 J	0.24 U	0.23 U	0.26 J	0.24 U
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	--	0.43 U	0.44 U	0.44 U	0.52 J	0.45 U	0.44 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	--	0.55 U	0.56 U	0.57 U	1.5	0.57 U	0.56 U
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	--	0.29 U	0.29 U	0.32 J	0.28 U	0.30 U	0.29 U
Total PFAS Concentration				**24**	**284**	**353**	**79**	**23**	**62**

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs) & Date Collected, and Concentration (µg/kg)					
				PF-4					
				1-4'	4-6'	6-8'	8-10'	10-12'	12-16'
				12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22
PFAS Compounds with Recommended Groundwater Standards									
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**92**	**8.5**	**16**	**4.7**	**2.6**	**17**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**9.2**	**49**	**140**	**3.0**	**0.68 J**	**3.4**
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.15 U	0.24 J	0.22 J	0.16 U	0.15 U	0.15 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	**11**	**2.3**	**2.8**	**0.76 J**	**0.33 J**	**6.0**
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	NRS	--	0.63 U	<0.66	<0.59	<0.64	<0.64	0.62 U
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	0.29 U	0.30 U	0.27 U	0.57 J	0.29 U	0.28 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.28 J	0.65 J	0.15 U	<0.16	0.21 J	0.27 J
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	0.30 J	0.66 J	0.46 J	0.71 J	1.7	0.47 J
PFAS Compounds without Recommended Groundwater Standards									
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	--	0.12 U	0.21 J	0.12 U	0.15 J	0.27 J	0.13 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	--	0.47 J	0.25 U	0.23 U	0.25 U	0.24 U	0.24 U
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	--	0.49 J	0.52 J	0.69 J	0.45 U	0.44 U	0.43 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	--	150	19	4.6	2.0	0.57 U	0.56 U
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	--	0.29 U	0.55 J	0.28 U	0.30 U	0.30 U	0.29 U
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	--	0.30 U	0.51 J	0.28 U	0.31 U	0.30 U	0.30 U
Total PFAS Concentration				**264**	**82**	**165**	**12**	**5.8**	**27**

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TABLE 4

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES (ug/kg) - DECEMBER 2022

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs) & Date Collected, and Concentration (µg/kg)						
				PF-5		PF-6				
				1-4'	8-12'	1-4'	4-6'	6-8'	8-12'	12-16'
				12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22
PFAS Compounds with Recommended Groundwater Standards										
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**2.0**	**11**	**1.2**	**3.8**	**7.2**	**3.8**	**5.0**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**1.3**	**1.9**	**29**	**210**	**290**	**150**	**130**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NRS	--	0.24 U	0.24 U	58	2.4	0.35 J	3.9	3.3
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NRS	--	0.66 U	0.64 U	3.1	0.68 U	0.70 U	0.66 U	0.67 U
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.15 U	0.15 U	0.16 U	0.16 U	**0.33 J**	0.19 J	**0.30 J**
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	**4.3**	**0.51 J**	**0.48 J**	**2.1**	**2.9**	**2.2**	**4.1**
Perfluorodecanoic Acid (PFDA)	335-76-2	**0.000081**	--	0.17 U	0.16 U	0.18 U	**0.24 J**	0.18 U	**0.27 J**	**0.18 J**
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	0.28 U	0.27 U	0.69 J	0.38 J	2.0	0.81 J	1.1
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.15 U	0.15 U	0.23 J	0.22 J	**2.6**	1.0	0.96 J
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	0.13 U	0.12 U	0.25 J	0.14 J	**3.6**	1.6	**3.9**
PFAS Compounds without Recommended Groundwater Standards										
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	--	0.12 U	0.12 U	0.62 J	0.25 J	0.89 J	0.38 J	0.53 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	--	1.6	0.23 U	0.25 U	0.25 U	0.79 J	0.37 J	0.50 J
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	--	0.43 U	0.42 U	0.45 U	0.45 U	0.77 J	0.43 U	0.91 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	--	0.55 U	0.54 U	0.58 U	0.61 J	2.4	0.85 J	3.0
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	--	0.17 U	0.17 U	0.51 J	1.2	1.0 J	0.99 J	0.50 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NRS	--	0.58 U	0.56 U	14	0.60 U	0.62 U	1.1	0.58 U
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	--	0.29 U	0.28 U	0.30 U	0.67 J	0.31 U	0.77 J	0.29 U
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	--	0.29 U	0.28 U	2.7	0.30 U	0.31 U	0.71 J	0.29 U
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	--	0.67 U	0.65 U	4.0	0.69 U	0.71 U	0.69 J	0.67 U
Total PFAS Concentration				**9.2**	**13**	**115**	**222**	**315**	**170**	**154**

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TABLE 4

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES (ug/kg) - DECEMBER 2022

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs) & Date Collected, and Concentration (µg/kg)			
				PF-7		PF-8	
				1-4'	8-12'	1-4'	16-18'
				12/06/22	12/06/22	12/06/22	12/06/22
PFAS Compounds with Recommended Groundwater Standards							
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	0.18 U	**9.0**	**3.0**	**0.28 J**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**6.6**	**4.4**	**36**	**2.6**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NRS	--	20	0.54 J	0.30 J	0.99 J
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2	NRS	--	1.0 U	0.96 U	0.97 U	2.0
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NRS	--	0.70 U	0.65 U	1.2	9.0
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.16 U	0.15 U	**0.74 J**	0.15 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	0.23 U	**1.7**	**0.26 J**	0.22 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.25 J	0.24 J	0.16 U	0.16 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	0.13 U	0.42 J	0.13 U	0.13 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**45**	--	0.38 J	0.31 U	0.31 U	0.32 U
PFAS Compounds without Recommended Groundwater Standards							
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	--	0.44 J	0.25 J	0.12 U	0.12 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	--	0.59 U	0.62 J	2.9	0.56 U
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	--	0.24 J	0.17 U	0.17 U	0.18 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NRS	--	8.5	0.57 U	0.58 U	0.59 U
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	NRS	--	0.32 U	0.29 U	0.30 U	0.30 U
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	--	1.8	0.28 U	0.29 U	0.29 U
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	NRS	--	0.58 U	0.53 U	0.54 U	0.55 U
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	--	5.0	0.29 U	0.29 U	0.30 U
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	--	2.9	0.66 U	0.67 U	0.68 U
Total PFAS Concentration				**46**	**17**	**44**	**15**

NOTES:

All samples were analyzed for PFAS using Method E537 Modified; only compounds detected in one or more samples are shown in each section of this table.

PFAS concentrations in soil are in micrograms per kilogram (µg/kg) equivalent to parts per billion (ppb).

Total PFAS concentrations rounded to nearest significant digit of the concentration with the fewest significant digits.

Bold font denotes PFAS concentration measured in soil at or above one or more US EPA or WDNR soil standards.

The Wisconsin Department of Natural Resources' (WDNR) industrial direct contact residual contaminant level (DC RCL) for the combined concentration of PFOA and PFOS of 16,400 µg/kg was determined using the USEPA's regional screen level (RSL) web calculator and following procedures in NR 720.12.

NRS = No recommended standard in Cycle 11.

J flag denotes concentration above MDL but below the method quantification limit (MQL).

U flag denotes compound was not detected above the indicated method detection limit (MDL).

Risk-based and Maximum Contaminant Levels (MCLs)-based Soil Screening Levels (SSLs) were taken from USEPA's Novmeber 2024 Regional Screening Levels (RSLs) table with Target Risk 1E-6 and Target Hazard Quotient 1.0 https://semspub.epa.gov/work/HQ/405297.pdf

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WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 5

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES - DECEMBER 2023

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs), Date Collected & Concentration (µg/kg)							
				PF-9		PF-10		PF-11		PF-12	
				0.5 - 5.0	5.0 - 7.5	0.5 - 5.0	5.0 - 7.5	0.5-2.5	0.5 - 5.0	0.5 - 5.0	5.0 - 7.5
				12/04/23	12/04/23	12/04/23	12/04/23	12/04/23	12/04/23	12/04/23	12/04/23
PFAS Compounds with Recommended Groundwater Standards											
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**0.94**	**0.45**	**0.14**	**0.078**	**3.8**	**0.16**	**1.5**	**1.4**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**7.0**	**3.7**	**8.5**	**0.36**	**24**	**1.7**	**1.3**	**1.9**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**NRS**	--	4.1	0.9	0.91	0.69	2.4	0.36	0.17	0.1
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691.99-2	**NRS**	--	NA	NA	NA	NA	1.9	NA	NA	NA
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	**NRS**	--	13	4.0	0.87	0.063 J	<0.68	<0.054	2.4	0.8
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.033	<0.013	0.028	<0.014	<0.16	0.082	0.047	0.037
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	**0.20**	**1.00**	0.13	0.120 J	**0.39 J**	<0.070	<0.066	<0.069
Perfluorodecanoic Acid (PFDA)	335-76-2	**NRS**	--	0.051	<0.047	0.13	<0.049	0.75 J	0.48	0.051 J	0.049 J
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	<0.044	0.045	<0.046	<0.046	<0.29	<0.046	<0.044	<0.046
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	<0.053	0.08	0.085	<0.055	0.39 J	0.060 J	0.060 J	<0.055
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**45**	--	<0.052	<0.052	<0.055	<0.054	0.88 J	0.280	<0.052	<0.054
Perfluorododecanoic Acid (PFDoA)	307-55-1	**170**	--	0.050 J	0.028 J	<0.029	<0.028	0.91 J	0.040 J	0.084 J	0.055 J
Perfluorotetradecanoic Acid (PFTeA)	367-06-7	**9,400**	--	<0.084	0.088 J	<0.089	<0.088	0.24 J	<0.089	<0.084	<0.088
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	<0.017	0.041	<0.018	<0.018	0.16 J	0.034	<0.017	0.042
PFAS Compounds without Recommended Groundwater Standards											
Perfluoropentanoic Acid (PFPeA)	2706-90-3	**NRS**	--	0.074	0.15	0.15	<0.043	0.37 J	0.094 J	0.092 J	0.071 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	**NRS**	--	<0.039	<0.040	<0.042	<0.041	0.30 J	0.053 J	0.047 J	<0.041
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	**NRS**	--	0.023	0.055	<0.015	<0.015	<0.45	<0.015	<0.014	<0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	**NRS**	--	0.061	<0.023	0.12	<0.023	0.20 J	0.051 J	0.035 J	0.042 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	**NRS**	--	0.1	0.048	0.022	0.016 J	2.9	0.21	0.07	0.046
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	**NRS**	--	0.2	0.14	<0.052	<0.051	<0.30	<0.052	0.29	0.18
Fluorotelomer Sulphonic Acid 10:2 (FtS 10:2)	12226-60-0	**NRS**	--	NA	NA	NA	NA	0.79 J	NA	NA	NA
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	**NRS**	--	7.3	1.3	<0.081	<0.080	<0.69	<0.081	0.13	<0.080
Total PFAS Concentration				**33**	**12**	**11**	**1.3**	**40**	**3.6**	**6.3**	**4.7**

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TABLE 5

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES - DECEMBER 2023

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs), Date Collected & Concentration (µg/kg)							
				PF-13		PF-14		PF-15		PF-16	
				0.5-2.5	0.5 - 5.0	0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 7.5
				12/05/23	12/05/23	12/05/23	12/05/23	12/05/23	12/05/23	12/05/23	12/05/23
PFAS Compounds with Recommended Groundwater Standards											
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**1.1**	**0.29**	**0.68**	**4.6**	**0.065**	0.04	**1.4**	**0.41**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**4.7**	**1.1**	**6.8**	**4.0**	**0.87**	**2.1**	**2.0**	**1.2**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**NRS**	--	2.8	2.1	1.3	0.16	0.25	<0.091	1.3	0.75
N-Ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2	NRS	--	1.7	NA	NA	NA	NA	NA	NA	NA
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NRS	--	1.3	2.8	11	2.9	0.66	<0.053	0.24	0.16
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	NRS	--	11	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	<0.16	0.017 J	0.04	0.088	0.025 J	0.016 J	0.068	0.05
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	<0.23	<0.066	<0.067	**0.340**	<0.070	<0.069	<0.068	<0.069
Perfluorodecanoic Acid (PFDA)	335-76-2	**NRS**	--	<0.18	<0.047	0.16	<0.047	<0.049	<0.049	0.14	0.072 J
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	<0.30	0.061 J	0.099 J	0.88	0.096 J	0.120 J	0.075 J	<0.046
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	<0.17	<0.053	<0.053	0.250	0.19	0.19	0.062 J	<0.055
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**45**	--	<0.33	0.069 J	<0.053	<0.052	<0.055	<0.054	0.270	0.098 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	**170**	--	<0.34	0.051 J	<0.028	<0.027	<0.029	<0.028	0.200	0.050 J
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	<0.13	<0.017	0.020 J	0.063	0.038	0.056	0.031	0.031
PFAS Compounds without Recommended Groundwater Standards											
Perfluoropentanoic Acid (PFPeA)	2706-90-3	**NRS**	--	0.18 J	0.088 J	0.130 J	0.35	0.4	0.43	0.18	0.095 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	**NRS**	--	<0.25	<0.039	<0.040	0.051 J	0.130 J	0.14	0.053 J	0.043 J
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	**NRS**	--	<0.18	0.062 J	0.061 J	0.046 J	0.032 J	<0.023	0.023 J	<0.023
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	**NRS**	--	<0.62	0.22	0.076	0.063	0.026 J	0.023 J	0.23	0.12
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	**NRS**	--	<0.31	0.14	<0.050	0.27	3.8	1.30	0.068 J	0.067 J
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	**NRS**	--	<0.58	<0.061	0.17	<0.061	0.081 J	<0.064	0.110 J	<0.064
N-Methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	**NRS**	--	0.67 J	NA	NA	NA	NA	NA	NA	NA
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	**NRS**	--	<0.71	0.089 J	0.26	<0.076	<0.081	<0.080	<0.078	<0.080
Total PFAS Concentration				**23**	**7.1**	**21**	**14**	**6.7**	**4.5**	**6.5**	**3.1**

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TABLE 5

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES - DECEMBER 2023

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs), Date Collected & Concentration (µg/kg)					
				PF-17		PF-18		PF-19	
				0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 10
				12/05/23	12/05/23	12/05/23	12/05/23	12/05/23	12/05/23
PFAS Compounds with Recommended Groundwater Standards									
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**21**	**4.9**	**4.2**	**1.4**	**3.1**	**5.9**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**0.68**	**0.5**	**13**	**10**	**5.4**	**0.038**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**NRS**	--	0.03	0.011 J	<0.087	<0.093	0.063	<0.087
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	**NRS**	--	0.24	0.064 J	<0.051	<0.054	<0.052	<0.051
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	<0.013	0.016 J	0.074	0.11	0.13	<0.013
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	0.093 J	<0.069	0.069 J	**0.18**	<0.067	**0.59**
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	0.68	0.15	0.081 J	<0.046	0.069 J	0.10 J
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.76	0.21	0.068 J	<0.056	<0.054	0.084 J
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**45**	--	<0.051	<0.054	<0.051	<0.055	<0.053	<0.052
Perfluorododecanoic Acid (PFDoA)	307-55-1	**170**	--	<0.027	<0.028	<0.027	<0.029	0.028 J	<0.027
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	**8.6**	2.4	0.043	<0.018	0.16	0.42
PFAS Compounds without Recommended Groundwater Standards									
Perfluoropentanoic Acid (PFPeA)	2706-90-3	**NRS**	--	0.99	0.120 J	0.13	0.058 J	0.110 J	0.16
Perfluoroheptanoic Acid (PFHpA)	375-85-9	**NRS**	--	0.27	0.17	0.15	0.110 J	0.058 J	0.16
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	**NRS**	--	0.49	0.08	<0.014	<0.015	<0.014	<0.014
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	**NRS**	--	<0.068	<0.073	0.28	0.31	0.077 J	<0.070
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	**NRS**	--	<0.022	<0.023	<0.022	<0.024	0.024 J	<0.022
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	**NRS**	--	<0.013	<0.014	<0.013	0.018 J	0.26	<0.013
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	**NRS**	--	<0.048	<0.051	0.13	0.093 J	0.16	<0.049
Total PFAS Concentration				**34**	**8.6**	**18**	**12**	**9.6**	**7.4**

TABLE 5

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES - DECEMBER 2023

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs), Date Collected & Concentration (µg/kg)							
				PF-20			PF-21			PF-22	
				0.5 - 2.5	0.5 - 5.0	5.0 - 7.5	0.5 - 2.5	0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 10
				12/06/23	12/05/23	12/06/23	12/06/23	12/06/23	12/06/23	12/06/23	12/06/23
PFAS Compounds with Recommended Groundwater Standards											
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	<0.18	**0.39**	**0.58**	<0.18	**0.26**	**7.8**	**0.20**	**8.8**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**4.0**	**1.4**	**0.033**	**4.0**	**1.1**	**0.039**	**0.25**	<0.024
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**NRS**	--	<0.26	<0.087	<0.088	<0.25	<0.086	<0.087	0.04	<0.0087
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	**NRS**	--	0.35 J	NA	NA	0.43 J	NA	NA	NA	NA
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	<0.16	0.036	<0.013	0.23 J	0.11	<0.013	0.015 J	<0.013
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	<0.23	<0.065	0.079 J	<0.23	<0.065	<0.066	0.16	**0.53**
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	<0.29	<0.043	<0.044	<0.29	<0.043	<0.044	<0.047	0.110 J
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	<0.16	<0.052	<0.053	<0.16	<0.052	0.094 J	<0.057	0.75
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**3.0**	--	<0.13	<0.017	0.036	<0.13	<0.017	<0.017	<0.019	0.058
PFAS Compounds without Recommended Groundwater Standards											
Perfluoropentanoic Acid (PFPeA)	2706-90-3	**NRS**	--	<0.13	0.056 J	0.068 J	<0.13	0.049 J	0.048	<0.044	0.66
Perfluoroheptanoic Acid (PFHpA)	375-85-9	**NRS**	--	<0.25	0.048 J	<0.039	<0.24	<0.038	0.15	<0.042	0.13
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	**NRS**	--	<0.61	<0.013	<0.014	<0.60	<0.013	<0.013	0.015 J	<0.013
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	**NRS**	--	<0.30	<0.048	<0.049	<0.30	<0.048	2.1	15	0.067 J
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	**NRS**	--	<0.56	<0.060	<0.061	<0.56	<0.060	0.081 J	0.098 J	<0.061
Total PFAS Concentration				**4.4**	**1.9**	**0.80**	**4.7**	**1.5**	**10**	**16**	**11**

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TABLE 5

SUMMARY OF PFAS DETECTED IN SOIL SAMPLES - DECEMBER 2023

PFAS Compound Group Description PFAS Compounds in Group	Chemical Abstract Service #	US EPA Risk- or MCL-based SSL	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Depth (ft bgs), Date Collected & Concentration (µg/kg)							
				PF-23		PF-24		PF-25		PF-26	PF-27
				0.5 - 5.0	5.0 - 10	0.5 - 5.0	5.0 - 10	0 - 2.5	0.5 - 5.0	0 - 2.5	0 - 2.5
				12/06/23	12/06/23	12/06/23	12/06/23	12/06/23	12/06/23	12/06/23	12/06/23
PFAS Compounds with Recommended Groundwater Standards											
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.061**	*16,400*	**0.09**	**1.4**	**0.14**	**0.21**	**0.43 J**	**0.13**	**0.85 J**	**0.77 J**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.03**		**16**	**1.6**	**8.4**	**9.5**	**0.68 J**	**0.33**	**6.5**	**8.1**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**NRS**	--	0.48	<0.087	0.19	0.14	<0.26	0.2	0.37 J	0.47 J
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	**NRS**	--	0.31	<0.051	0.097 J	0.056 J	<0.69	0.130 J	<0.68	<0.68
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	**NRS**	--	NA	NA	NA	NA	NA	NA	0.33 J	0.68 J
Perfluorononanoic Acid (PFNA)	375-95-1	**0.25**	--	0.099	0.037	0.082	0.059	<0.16	0.035	<0.16	<0.16
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**0.17**	--	<0.066	0.110 J	<0.068	<0.067	<0.23	<0.070	**0.24 J**	<0.23
Perfluorodecanoic Acid (PFDA)	335-76-2	**NRS**	--	0.18	<0.046	0.061 J	<0.048	<0.18	0.140 J	<0.18	<0.18
Perfluorobutanoic Acid (PFBA)	375-22-4	**6.5**	--	<0.044	<0.043	0.14	0.052 J	<0.30	<0.046	<0.29	<0.29
Perfluorohexanoic Acid (PFHxA)	307-24-4	**2.4**	--	0.058 J	0.31	<0.055	0.059 J	<0.16	<0.056	0.22 J	0.30 J
PFAS Compounds without Recommended Groundwater Standards											
Perfluoropentanoic Acid (PFPeA)	2706-90-3	**NRS**	--	0.22	0.29	0.076 J	<0.042	<0.13	0.060 J	0.37 J	0.13 J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	**NRS**	--	0.051 J	0.090 J	0.056 J	0.056 J	<0.25	0.085 J	<0.24	<0.25
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	**NRS**	--	0.031 J	<0.022	0.026 J	0.026 J	<0.18	<0.024	<0.18	<0.18
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	**NRS**	--	0.11	<0.013	0.022 J	0.017 J	<0.61	0.054	<0.60	<0.60
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	**NRS**	--	4.7	2.9	<0.051	<0.050	<0.30	0.100 J	<0.30	<0.30
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	**NRS**	--	0.19	<0.061	<0.064	<0.062	<0.57	0.120 J	<0.56	<0.56
Total PFAS Concentration				**23**	**6.8**	**9.3**	**10**	**1.1**	**1.4**	**8.9**	**10**

NOTES:

Samples were analyzed for PFAS using Method E537 Modified or Method D7968-17A; only compounds detected in one or more samples are shown in this table, and only in sections of the table where it was detected.
PFAS concentrations in soil are in micrograms per kilogram (µg/kg) equivalent to parts per billion (ppb).
Bold font denotes PFAS concentration measured in soil at or above one or more US EPA or WDNR soil standards.
The Wisconsin Department of Natural Resources' (WDNR) industrial direct contact residual contaminant level (DC RCL) for the combined concentration of PFOA and PFOS of 16,400 µg/kg was determined using the USEPA's regional screen level (RSL) web calculator and following procedures in NR 720.12.
NRS = No recommended standard in Cycle 11. NA- - Not analyzed.
J flag denotes concentration above MDL but below the method quantification limit (MQL).
Risk-based and Maximum Contaminant Levels (MCLs)-based Soil Screening Levels (SSLs) were taken from US EPA November 2024 RSL table with Target Risk of 1E-6 and Target Hazard Quotient of 1.0 https://semspub.epa.gov/work/HQ/405297.pdf

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WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 6

SUMMARY OF PFAS DETECTED IN ASPHALT SAMPLES - AUGUST 2023

PFAS Compound	Chemical Abstract Service #	WDNR Industrial DC RCL for PFAS in Soil	Sample ID, Date Collected, & Concentration (ug/kg)								
			ASP-1	ASP-2	ASP-3	ASP-4	ASP-5	ASP-6	ASP-7	ASP-8	ASP-9
			8/16/23	8/16/23	8/16/23	8/16/23	8/16/23	8/16/23	8/17/23	8/17/23	8/17/23
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	--	<0.24	<0.25	<0.24	<0.24	<0.23	**0.27 J**	<0.24	<0.25	<0.23
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	*16,400* [(1)]	<0.19	<0.20	<0.19	**0.36 J**	**0.28 J**	<0.20	<0.19	<0.20	<0.18
Perfluoropentanoic Acid (PFPeA)	2706-90-3	--	<0.12	<0.12	<0.12	**0.16 J**	**0.15 J**	<0.12	<0.12	<0.12	<0.11
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	--	<0.28	<0.29	<0.28	<0.27	<0.27	<0.28	<0.27	**0.41 J**	<0.27

NOTES:
Concentrations are in micrograms per kilogram (µg/kg), dry weight, equivalent to parts per billion (ppb) with detected concentrations in **bold**.
All samples were analyzed for PFAS using Method E537 Modified; only compounds detected in one or more samples are shown in this table.
J flag denotes concentration above the method detection limit (MDL) but below the method quantification limit (MQL).

FOOTNOTE:
(1) The Wisconsin Department of Natural Resources' (WDNR) industrial direct contact residual contaminant level (DC RCL) for the combined concentration of PFOA and PFOS of 16,400 µg/kg was determined using the USEPA's regional screen level (RSL) web calculator and following procedures in NR 720.12.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 7

SUMMARY OF PFAS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM AIR SPARGE WELLS AND GEOPROBE BORINGS (DECEMBER 2022 - APRIL 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		Boring ID, Sample Depth (ft bgs) and Collection Date										
				AS-6	AS-7	AS-8	AS-9	PF-1	PF-2		PF-3	PF-7	PF-8	PF-9
				22-24	20.7-22.7	22-24	22-24	18-22	17-21	44-48	16-20	43-47	18-22	8-12
		NR 140 ES	NR 140 PAL	12/05/22	12/05/22	12/05/22	12/05/22	12/06/22	12/06/22	04/17/24	12/06/22	04/17/24	12/06/22	12/04/23
PFAS Compound with Recommended Standards														
Perfluorooctanoic Acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**3,400**	**8,700**	**2,700**	**6,200**	**9,300**	**16,000**	*3.6*	**7,500**	**20**	**32,000**	**830**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1			**15,000**	**15,000**	**16,000**	**17,000**	**8,200**	**71,000**	*6.8*	**12,000**	**46**	**1,500**	**1,600**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	1.7	**7.0**	<0.79	*4.40 J*	**93**	**9.10 J**	<0.79	**1,400**	<0.90	**11**	**44**
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2			<1.2	**11**	<1.3	<1.2	**22**	<2.3	<1.3	**40**	<1.4	**10**	<2.3
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6			<1.6	**610**	*6.9*	*3.20 J*	**55**	**190**	<1.7	**2,100**	<1.9	**120**	**15**
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2			<1.1	<1.1	<1.2	<1.1	**18**	<2.1	<1.2	<2.1	<1.3	**7.20 J**	<2.1
Perfluorononanoic Acid (PFNA)	375-95-1	**30**	*3*	**99**	**110**	**84**	**140**	**100**	**420**	<0.96	**98**	<1.1	**140**	*11*
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**40**	*4*	**4,200**	**6,500**	**2,400**	**6,000**	**450**	**3,200**	2.00 J	**1,800**	*6.20 J*	**3,400**	**450**
HFPO-DA/Gen X	13252-13-6	**300**	*30*	2.00 J	3.00 J	1.40 J	2.70 J	4.20 J	23	<1.3	21	<1.5	9.20 J	<2.3
Perfluorodecanoic Acid (PFDA)	335-76-2	**300**	*60*	30	12	14	12	22	*200*	<1.4	12	<1.6	<2.5	4.20 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	**500**	*100*	1.10 J	<0.74	1.00 J	<0.71	<1.4	<1.4	<0.77	<1.4	<0.87	<1.4	<1.4
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**3,000**	*600*	<1.0	1.30 J	<1.1	<1.0	<1.9	<1.9	<1.1	<1.9	<1.2	<1.9	<1.9
Perfluorobutanoic Acid (PFBA)	375-22-4	**10,000**	*2,000*	1,000	*2,800*	620	1,400	610	**13,000**	8.5	**23,000**	15	1,800	870
Perfluorohexanoic Acid (PFHxA)	307-24-4	**150,000**	*30,000*	1,400	3,800	960	1,300	500	7,200	<1.3	9,200	10	1,300	2,000
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**450,000**	*90,000*	1,600	3,300	830	2,800	1,200	17,000	3.70 J	20,000	62	1,600	340
PFAS Compound without Recommended Standards														
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	NRS	990	2,000	790	880	700	5,900	<1.4	9,300	19	1,500	740
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	NRS	310	470	260	400	150	1,400	<1.9	1,500	2.80 J	880	670
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	NRS	930	1,500	550	1,200	20	1,000	<0.62	1,000	0.84 J	380	66
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	1,200	1,600	530	1,100	400	1,300	<0.63	420	<0.71	200	13
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	NRS	48	55	47	31	3.90 J	31	<0.55	6.50 J	<0.62	3.90 J	3.60 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NRS	NRS	1.90 J	2.20 J	2.00 J	1.80 J	<2.7	2.90 J	<1.5	<2.7	<1.7	<2.7	<2.7
4:2 (FtS 4:2)	757124-72-4	NRS	NRS	<0.97	<1.0	<1.0	<0.96	<1.9	11	<1.0	5.90 J	<1.2	<1.9	<1.9
6:2 (FtS 6:2)	27619-97-2	NRS	NRS	250	280	330	230	95	610	<2.1	230	<2.4	120	98
8:2 (FtS 8:2)	39108-34-4	NRS	NRS	57	1.70 J	29	24	<2.3	<2.3	<1.3	<2.3	<1.4	<2.3	15
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	NRS	<0.82	<0.85	<0.88	<0.81	<1.6	<1.6	<0.88	2.00 J	<1.0	<1.6	<1.6
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	NRS	3.10 J	20	8.9	1.00 J	4.60 J	8.10 J	<0.71	13	<0.81	<1.3	34
Total PFAS Concentrations (ng/l)				**30,524**	**46,783**	**26,164**	**38,730**	**21,948**	**138,505**	**25**	**89,648**	**182**	**44,981**	**7,804**

GANNETT FLEMING

TABLE 7

SUMMARY OF PFAS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM AIR SPARGE WELLS AND GEOPROBE BORINGS (DECEMBER 2022 - APRIL 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		Boring ID, Sample Depth (ft bgs) and Collection Date										
				PF-10	PF-11				PF-12	PF-13	PF-14		PF-15	PF-16
				7-11	7-11	25-29	41-45	57-61	9-13	2-6	14-18	50-54	13-17	9-13
		NR 140 ES	NR 140 PAL	12/04/23	12/04/23	4/16/24	4/16/24	4/16/24	12/05/23	12/05/23	12/05/23	4/19/24	12/05/23	12/5/2023
PFAS Compound with Recommended Standards														
Perfluorooctanoic Acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**540**	**840**	**1,100**	**1,500**	**39**	**580**	**180**	**930**	**15**	**780**	**170**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1			**1,900**	**3,200**	**2,000**	**2,700**	**64**	**850**	**510**	**870**	**86**	**1,500**	**400**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	**96.0**	**32**	1.8	0.81	*1.70 J*	**45**	**530**	**49**	<0.80	**81**	**26 J**
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-6			<2.3	<2.3	<1.3	<1.2	<1.3	<2.3	**240 J**	**5.2 J**	<1.3	<2.3	<29
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6			**76**	**34**	<1.7	<1.6	*3.00 J*	**16**	**470**	**14**	*3.7*	**44**	<39
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2			<2.1	<2.1	<1.1	<1.1	<1.2	<2.1	**1,900**	**21**	<1.2	<2.1	<26
Perfluorononanoic Acid (PFNA)	375-95-1	**30**	*3*	*17*	*26*	*10*	*20*	<0.99	*7.4 J*	<44	*11*	1.3	*11*	<22
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**40**	*4*	**160**	**250**	**250**	**520**	*15*	**130**	**67 J**	**260**	*5.8*	**510**	**66 J**
Hexafluoropropylene oxide dimer acid (HFPO-DA/Gen X)	13252-13-6	**300**	*30*	<2.3	9.4 J	2.40 J	<1.2	<1.3	3.5 J	<62	5.1 J	<1.3	5.6 J	<31
Perfluorodecanoic Acid (PFDA)	335-76-2	**300**	*60*	6.8	<2.3	2.3	3.1	<1.4	<2.3	<58	<2.3	<1.4	2.4 J	<29
Perfluorododecanoic Acid (PFDoA)	307-55-1	**500**	*100*	<1.4	<1.4	<0.75	<0.72	<0.79	<1.4	<35	<1.4	<0.77	<1.4	<17
Perfluorobutanoic Acid (PFBA)	375-22-4	**10,000**	*2,000*	560	670	1,200	1,900	69	780	<130	950	18	1,300	150
Perfluorohexanoic Acid (PFHxA)	307-24-4	**150,000**	*30,000*	590	730	1,100	1,500	16	980	84 J	1,300	9.1	2,000	180
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**450,000**	*90,000*	190	300	410	440	180	220	20 J	360	26	530	120
PFAS Compound without Recommended Standards														
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	NRS	300	460	780	1,100	15	390	90 J	460	14	1,400	290
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	NRS	220	330	250	500	9.1	310	<86	370	3.0	580	75 J
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	NRS	27	43	79	110	4.5	31	<28	45	0.64 J	77	<14
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	15	23	6.2	42	0.8	11	<28	19	<0.63	15	<14
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	NRS	3.4	6.1 J	<0.54	3.4	<0.56	2.0 J	<25	<0.99	<0.56	4.1 J	<12
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	NRS	NRS	<1.9	<1.9	2.4	<0.97	<1.1	<1.9	<47	<1.9	<1.0	2.5 J	<23
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	NRS	120	40	110	39	<2.2	140	510	120	<2.2	210	<48
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	NRS	NRS	10	93	20.00 J	13	<1.3	12	<56	3.9 J	<1.3	19	<28
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	NRS	<1.6	<1.6	<0.87	<0.82	<0.90	<1.6	70 J	<1.6	<0.89	<1.6	<20
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	NRS	28.00 J	8.9 J	3.4	1.0	0.74 J	26	<32	11	<0.72	50	<16
Total PFAS Concentrations (ng/l)				**4,859**	**7,095**	**7,327**	**10,392**	**418**	**4,534**	**4,671**	**5,804**	**182**	**9,122**	**1,477**

GANNETT FLEMING

TABLE 7

SUMMARY OF PFAS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM AIR SPARGE WELLS AND GEOPROBE BORINGS (DECEMBER 2022 - APRIL 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/l)		Boring ID, Sample Depth (ft bgs) and Collection Date										
				PF-16				PF-17	PF-19		PF-20	PF-21	PF-22	PF-23
				25-29	40-44	50-54	65-69	13-17	17-21	44-48	17-21	17-21	16-20	16-20
		NR 140 ES	NR 140 PAL	4/18/24	04/18/24	4/18/24	04/19/24	12/05/23	12/05/23	4/18/24	12/06/23	12/06/23	12/06/23	12/06/23
PFAS Compound with Recommended Standards														
Perfluorooctanoic Acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**300**	**5,900**	**410**	**26**	**2,300**	**8,400**	*4.8*	**50**	**960**	**980**	**910**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1			**710**	**860**	**180**	**3.0**	**2,600**	**16**	*2.5*	**560**	**2.1**	<1.8	**4.2**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.75	<1.4	<0.82	<0.80	<1.4	*3.8 J*	<0.95	<1.4	<0.67	<1.4	<1.4
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2			<1.2	<2.3	<1.3	<1.3	<2.3	<1.1	<1.5	<2.3	<1.1	<2.3	<2.3
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6			<1.6	<3.1	<1.8	<1.7	<3.1	<1.5	<2.1	<3.1	<1.5	<3.1	<3.1
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2			<1.1	<2.1	<1.2	<1.2	<2.1	<1.0	<1.4	<2.1	<0.99	<2.1	<2.1
Perfluorononanoic Acid (PFNA)	375-95-1	**30**	*3*	*22*	*14*	*3*	<0.97	*16*	*5.2*	<1.2	2.4 J	1.0 J	<1.7	<1.7
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**40**	*4*	**56**	**630 J**	**43**	*8.50 J*	**89**	**280**	1.7 J	*9.2 J*	*28*	**84**	**64**
Hexafluoropropylene oxide dimer acid (HFPO-DA/Gen X)	13252-13-6	**300**	*30*	<1.2	21	<1.3	<1.3	3.6 J	<1.2	<1.6	<2.5	<1.2	<2.5	<2.5
Perfluorodecanoic Acid (PFDA)	335-76-2	**300**	*60*	*<1.3*	12	4.4	<1.4	<2.3	3.1 J	<1.7	<2.3	<1.1	<2.3	3.6 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	**500**	*100*	<0.73	<1.4	<0.80	<0.77	<1.4	<0.67	<0.93	<1.4	<0.65	<1.4	<1.4
Perfluorobutanoic Acid (PFBA)	375-22-4	**10,000**	*2,000*	130	4200	180	33	*2,100*	*5,300*	15	190	410	900	1,100
Perfluorohexanoic Acid (PFHxA)	307-24-4	**150,000**	*30,000*	62	1300	97	7.5	1,100	1,400	5.3	100	270	910	2,300
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**450,000**	*90,000*	240	4700 J	280	77	850	11,000	10	140	240	260	280
PFAS Compound without Recommended Standards														
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	NRS	73	1300	73	8.9	840	960	4.3	260	580	2,500	3,600
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	NRS	36	590	42	3.60 J	790	490	<2.3	46	39	130	70
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	NRS	9.3	280	21	1.70 J	47	200	<0.75	3.0 J	5.2	6.9 J	19
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	16	17	3.0	<0.63	21	13	<0.76	2.8 J	4.2 J	11	8.2 J
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	NRS	<0.53	2.1	<0.57	<0.56	96	<0.48	<0.66	<0.99	<0.47	<0.99	<0.98
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	NRS	NRS	<0.99	<1.9	<1.1	<1.0	1.9 J	<0.90	<1.3	<1.9	<0.89	72	180
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	NRS	19	37	<2.2	<2.2	250	1.9 J	<2.6	<3.8	<1.8	480	110
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	NRS	NRS	3.8	<2.2	<1.3	<1.3	<2.3	<1.1	<1.5	<2.3	<1.1	<2.3	<2.2
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	NRS	<0.84	<1.6	<0.91	<0.89	<1.6	<0.76	<1.1	<1.6	<0.75	<1.6	<1.6
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	NRS	<0.68	<1.3	<0.74	<0.72	4.2 J	<0.62	<0.86	<1.3	<0.61	<1.3	<1.3
Total PFAS Concentrations (ng/l)				**1,677**	**19,863**	**1,336**	**169**	**11,109**	**28,073**	**42**	**1,363**	**2,540**	**6,334**	**8,649**

GANNETT FLEMING

TABLE 7

SUMMARY OF PFAS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM AIR SPARGE WELLS AND GEOPROBE BORINGS (DECEMBER 2022 - APRIL 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/l)		Boring ID, Sample Depth (ft bgs) and Collection Date										
				PF-24			PF-25				PF-26			
				13-17	20-24	30-34	15-19	26-30	40-44	52-56	5-10	13-17	22-26	40-44
		NR 140 ES	NR 140 PAL	12/06/23	04/18/24	04/18/24	04/18/24	04/18/24	04/18/24	04/19/24	12/06/23	04/17/24	04/17/24	04/17/24
PFAS Compound with Recommended Standards														
Perfluorooctanoic Acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**230**	**400**	**19**	**270**	**910**	**2,300**	**400**	**350**	**370**	**540**	**1,200**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1			**750**	**700**	**210**	**310**	**1,200**	**340**	**240**	**230**	**300**	**340**	**840**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.66	<0.77	<0.92	**38**	<0.79	*3.60 J*	<0.84	**26**	*15*	1.2 J	*5.00 J*
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2			<1.1	<1.2	<1.5	<1.3	<1.3	<1.2	<1.4	<1.1	<1.2	<1.1	<1.3
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6			<1.4	<1.7	<2.0	**4.90 J**	<1.7	<1.6	<1.8	*4.8*	*2.90 J*	<1.5	<1.7
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2			<0.98	<1.1	<1.4	<1.2	<1.2	<1.1	<1.2	<1.0	<1.1	<1.0	<1.2
Perfluorononanoic Acid (PFNA)	375-95-1	**30**	*3*	*7.5*	*4.20 J*	<1.1	*5.00 J*	*6.5*	*17*	<1.0	*4.8 J*	*4.40 J*	*6.8*	**37**
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**40**	*4*	**58**	**430**	*26*	**87**	**240**	**130**	**110**	**110**	**93**	**160**	**120**
Hexafluoropropylene oxide dimer acid (HFPO-DA/Gen X)	13252-13-6	**300**	*30*	3.3 J	<1.3	<1.5	<1.3	<1.3	1.70 J	<1.4	2.3 J	<1.2	<1.1	<1.3
Perfluorodecanoic Acid (PFDA)	335-76-2	**300**	*60*	<1.1	<1.3	<1.6	1.80 J	<1.4	2.40 J	<1.5	<1.1	1.50 J	4.40 J	5.7
Perfluorododecanoic Acid (PFDoA)	307-55-1	**500**	*100*	<0.65	<0.74	<0.90	1.40 J	<0.77	<0.72	<0.82	0.7 J	<0.72	<0.67	<0.76
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**3,000**	*600*	<0.91	<1.0	<1.3	1.10 J	<1.1	<1.0	<1.2	<0.93	<1.0	<0.95	<1.1
Perfluorobutanoic Acid (PFBA)	375-22-4	**10,000**	*2,000*	340	340	28	370	810	500	40	440	420	800	480
Perfluorohexanoic Acid (PFHxA)	307-24-4	**150,000**	*30,000*	140	250	28	440	1,100	420	69	630	530	770	590
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**450,000**	*90,000*	33	73	19	170	270	390	32	270	250	250	190
PFAS Compound without Recommended Standards														
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	NRS	180	320	31	250	580	610	62	310	320	430	880
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	NRS	69	120	3.90 J	140	280	200	14	220	200	250	250
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	NRS	3.2 J	34	3.90 J	18	60	17	4.90 J	25	20	38	15
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	4.3 J	5.30 J	5.90 J	5.50 J	5.20 J	21	17	6.3	7.7	9.6	26
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	NRS	<0.46	<0.53	<0.64	0.77 J	<0.55	<0.52	<0.59	<0.47	<0.52	1.50 J	1.00 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NRS	NRS	<1.3	<1.5	<1.8	10	<1.5	<1.4	<1.6	<1.3	1.60 J	<1.3	<1.5
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	NRS	NRS	<0.87	<1.0	<1.2	<1.1	1.80 J	2.90 J	<1.1	1.1 J	<0.97	1.00 J	1.40 J
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	NRS	<1.8	<2.1	<2.5	40	100	440	<2.3	31	59	96	480
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	NRS	NRS	<1.1	<1.2	<1.5	1.70 J	<1.3	11	<1.3	1.4 J	<1.2	4.90 J	35
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	NRS	<0.74	<0.85	<1.0	3.10 J	<0.88	<0.83	<0.94	<0.76	<0.82	<0.77	<0.87
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	NRS	<0.60	<0.69	<0.84	10	1.80 J	1.00 J	<0.76	5.9	4.70 J	11	1.60 J
Total PFAS Concentrations (ng/l)				**1,818**	**2,677**	**375**	**2,178**	**5,565**	**5,408**	**989**	**2,669**	**2,600**	**3,714**	**5,158**

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TABLE 7

SUMMARY OF PFAS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM AIR SPARGE WELLS AND GEOPROBE BORINGS (DECEMBER 2022 - APRIL 2024)

PFAS Compound by Group	Chemical Abstract Service #	WI DHS/WDNR Recommended		Boring ID, Sample Depth (ft bgs) and Collection Date				
				PF-26	PF-27			
				55-59	11-15	22-26	52-56	64-68
		NR 140 ES	NR 140 PAL	04/17/24	04/15/24	04/15/24	04/15/24	04/15/24
PFAS Compound with Recommended Standards								
Perfluorooctanoic Acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**260**	**390**	**740**	**800**	**710**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1			**42**	**270**	**850**	**1,700**	**280**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.83	*13*	0.98 J	*3.90 J*	0.96 J
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2			<1.3	<1.2	<1.1	<1.2	<1.2
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6			<1.8	*5.9*	*3.20 J*	*5.20 J*	<1.6
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2			<1.2	<1.1	<1.0	<1.1	<1.1
Perfluorononanoic Acid (PFNA)	375-95-1	**30**	*3*	<1.0	*4.80 J*	*5.2*	*18*	*7.0*
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	**40**	*4*	**210**	**110**	**230**	**180**	**220**
Hexafluoropropylene oxide dimer acid (HFPO-DA/Gen X)	13252-13-6	**300**	*30*	<1.4	<1.2	<1.2	<1.3	<1.2
Perfluorodecanoic Acid (PFDA)	335-76-2	**300**	*60*	<1.5	<1.3	4.30 J	<1.3	<1.3
Perfluorododecanoic Acid (PFDoA)	307-55-1	**500**	*100*	<0.81	<0.70	<0.69	<0.75	<0.73
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	**3,000**	*600*	<1.1	<0.99	<0.97	<1.1	<1.0
Perfluorobutanoic Acid (PFBA)	375-22-4	**10,000**	*2,000*	31	430	1,100	230	390
Perfluorohexanoic Acid (PFHxA)	307-24-4	**150,000**	*30,000*	49	600	1,100	100	200
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	**450,000**	*90,000*	23	240	300	110	180
PFAS Compound without Recommended Standards								
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NRS	NRS	58	330	590	83	150
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NRS	NRS	8.1	230	310	33	68
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NRS	NRS	7.9	22	56	18	42
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	8.2	10	6.6	120	36
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NRS	NRS	<0.58	<0.50	1.10 J	<0.54	<0.53
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NRS	NRS	<1.6	1.50 J	<1.4	<1.5	<1.5
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	NRS	NRS	<1.1	<0.95	1.40 J	<1.0	<1.0
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	NRS	NRS	<2.2	67	170	13	26
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	NRS	NRS	<1.3	<1.1	13	<1.2	<1.2
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	NRS	NRS	<0.93	2.40 J	<0.79	<0.86	<0.84
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NRS	NRS	<0.75	17	16	<0.69	<0.68
Total PFAS Concentrations (ng/l)				**697**	**2,744**	**5,498**	**3,414**	**2,310**

NOTES:

PFAS concentrations in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).

All samples were analyzed for PFAS using Method E537 Modified; only compounds detected in one or more samples are shown in this table.

C1 = The WDNR proposed an ES and PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed 9/15/23 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code (Nov. 2020).

Detected concentrations at or above a recommended NR 140 PAL are *italicized* ; those at or above a recommended NR 140 ES are **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

Wisconsin Department of Health Service recommended NR 140 enforcement standards (ES) and preventative action limit (PAL) as part of Cycle 11 recommended revisions to the NR 140 Code.

J flag denotes concentration above its method detection limit (MDL) but below the method quantification limit (MQL).

"<" denotes compound was not detected above the indicated MDL.

NRS = No reccomended standard yet from Cycle 11.

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WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		PW-1			DW-1			W-1			W-1A		
		NR 140 ES	NR140 PAL	4/15/21	9/20/23	6/26/24	5/1/21	5/23/23	5/27/24	10/8/21	5/24/23	5/29/24	10/8/21	5/24/23	5/29/24
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2* [C1]	**5.0**	**6.7**	**7.6**	<0.79	<0.68	<0.65	**510**	**300**	**47**	**950**	**740**	**970**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**24**	**43**	**47**	<0.51	<0.86	<0.82	**340**	**290**	**240**	**580**	**680**	**1,300**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2* [C2]	<0.96	<0.71	<0.67	1.1 J	<0.69	<0.65	**76**	**47**	**78**	**24**	**42**	**83**
NEtFOSA	4151-50-2			<0.85	<1.1	<1.1	<0.81	<1.1	<1.1	<1.2	**1.3 J**	<1.2	<1.1	<1.1	<1.2
NEtFOSAA	2991-50-6			<1.3	<1.5	<1.5	<1.2	<1.5	<1.4	**9.4**	**11.0**	**3.6 J**	**1.1 J**	**1.7 J**	**3.6 J**
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.26	<0.87	<0.83	<0.25	<0.84	<0.80	*6.3*	*4.8* J	2.7 J	*9.0*	*8.7*	*8.7*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	*15*	*7.9*	*4.9*	<0.53	<0.87	<0.83	**220**	**110**	*18*	**290**	**230**	**290**
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.5	<1.2	<1.1	<1.4	<1.1	<1.1	5.7	<1.3	<1.2	4.6 J	1.6 J	<1.2
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<0.3	<1.2	<1.2	<0.29	<1.2	<1.1	2.4 J	1.7 J	2.4 J	2.4 J	1.8 J	4.6 J
Perfluorododecanoic acid (PFDoA)	307-55-1	**500**	*100*	<0.54	<0.69	<0.66	<0.51	<0.67	<0.63	<1.5	1.5 J	<0.72	<1.4	<0.68	<0.72
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	7.9	7.6	9.1	<2.2	<2.5	<2.4	970	390	92	1,200	1,100	980
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	4.6	6.2	6.7	0.57 J	<1.2	<1.1	1,100	410	77	960	840	1,500
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	5.0	8.6	8.8	<0.19	<0.34	<0.32	400	210	43	430	410	400
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	3.3	6.8	8.6	<0.46	<1.2	<1.2	570	280	63	770	620	680
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	1.1 J	<1.7	1.9 J	<0.23	<1.7	<1.6	400	140	25	330	230	450
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	1.0 J	0.59 J	<0.53	<0.28	<0.54	<0.51	78	22	3.8 J	120	64	75
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	2.1	2.0 J	2.1 J	<0.18	<0.55	<0.52	17	7	2.8 J	13	6.3	7.5
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.36	<0.50	<0.47	<0.35	<0.48	<0.46	0.82 J	<0.53	1.2 J	<0.48	<0.49	1.7 J
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<0.31	<1.4	<1.3	<0.30	<1.3	<1.3	9.6	5.9	2.2 J	<1.3	<1.4	<1.4
4:2 FTS	757124-72-4	NRS	NRS	<0.23	<0.94	<0.89	<0.22	<0.91	<0.86	1.0 J	1.1 J	<0.97	2.3 J	2.6 J	4.3 J
6:2 FTS	27619-97-2	NRS	NRS	<2.4	<1.9	<1.8	<2.3	<1.9	<1.8	97	130	58	310	190	190
8:2 FTS	39108-34-4	NRS	NRS	<0.45	<1.1	<1.1	<0.43	<1.1	<1.0	3.20 J	2.3 J	1.7 J	41	30	86
NMeFOSA	31506-32-8	NRS	NRS	<0.42	<1.0	<0.75	<0.40	<0.77	<0.73	<0.81	3.6 J	<0.82	<0.76	1.7 J	<0.83
NMeFOSAA	2355-31-9	NRS	NRS	<1.2	<0.64	<0.61	<1.1	0.71 J	<0.59	14	14	4.8 J	6.9	7.6	16
Total Concentration of All Detected PFAS Compounds				69	89	97	2	1	0	4,832	2,383	766	6,044	5,208	7,050

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-1D			W-2		W-2A		W-2B		W-3		W-3A
		NR 140 ES	NR140 PAL	10/8/21	5/24/23	5/29/24	10/7/21	5/28/24	10/7/21	5/29/24	10/7/21	5/28/24	10/6/21	5/27/24	10/6/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**770**	**1,100**	**1,200**	**42**	**54**	*1.8* J	*3.0*	**17**	*3.7*	**3.8**	**5.3**	*1.2* J
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**570**	**630**	**540**	**38**	**77**	*2.0* J	<0.96	**4.1**	*1.1* J	**19**	**15**	<0.84
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	*8.2*	**24**	**24**	<0.72	<1.4	<0.70	<0.77	<0.67	<0.71	<0.82	<1.4	<0.67
NEtFOSA	4151-50-2			<1.2	<1.4	<1.4	<1.2	<2.3	<1.1	<1.2	<1.1	<1.1	<1.3	<2.3	<1.1
NEtFOSAA	2991-50-6			*0.88* J	**2.6** J	<1.8	<0.63	<3.1	<0.62	<1.7	<0.59	<1.5	<0.72	<3.1	<0.59
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*14*	*13*	*9.8*	<0.88	<1.7	<0.86	<0.94	<0.82	<0.87	1.6 J	<1.7	<0.82
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**260**	**210**	**220**	*28*	*32*	<0.36	<0.97	**53**	*4.5* J	<0.43	<1.8	<0.35
HFPO-DA (GenX)	13252-13-6	**300**	*30*	2.5 J	<1.4	<1.4	<1.2	<2.3	<1.2	<1.3	<1.1	<1.2	<1.3	<2.3	4.6 J
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	4.0 J	2.3 J	1.6 J	<1.3	<2.5	<1.2	<1.3	<1.2	<1.2	<1.4	<2.5	<1.2
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	1,600	1,700	1,600	120	210	4.1 J	<2.8	54	34	13	7.4 J	3.5 J
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	1,000	810	970	93	130	3.5 J	<1.3	13	3.5 J	12	3.3 J	<1.1
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	420	540	550	270	210	0.69 J	1.3 J	19	16	18	2.6 J	<0.33
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	1,000	900	990	140	340	6.6	<1.4	10	4.7 J	20	5.0 J	3.0 J
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	260	190	310	27	33	1.3 J	<1.9	5.5	<1.7	5.6 J	<3.5	0.42 J
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	110	74	80	3.2 J	2.2 J	<0.55	<0.60	4.9	0.61 J	0.83 J	<1.1	<0.52
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	34	12	13	1.3 J	1.9 J	<0.56	<0.61	4.7	<0.56	<0.65	<1.1	<0.53
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.51	<0.59	<0.59	<0.50	<0.99	<0.49	<0.53	<0.47	<0.49	<0.57	<0.99	<0.47
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.4	<1.6	<1.6	<1.4	<2.7	<1.3	<1.5	<1.3	<1.4	<1.6	<2.7	<1.3
4:2 FTS	757124-72-4	NRS	NRS	1.9 J	2.0 J	2.4 J	<0.95	<1.9	<0.92	<1.0	<0.89	<0.93	<1.1	<1.9	<0.88
6:2 FTS	27619-97-2	NRS	NRS	160	100	110	<0.67	<3.8	<0.65	<2.1	<0.63	<1.9	2.5 J	<3.8	<0.62
8:2 FTS	39108-34-4	NRS	NRS	6.5	9.6	5.8 J	<1.1	<2.3	<1.1	<1.2	<1.1	<1.1	<1.3	<2.3	<1.1
NMeFOSAA	2355-31-9	NRS	NRS	7.9	8.5	2.9 J	<0.65	<1.3	<0.63	<0.69	<0.61	<0.64	<0.74	<1.3	<0.61
Total Concentration of All Detected PFAS Compounds				6,230	6,328	6,630	763	1,090	20	4	185	68	96.3	38.6	12.7

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-3A	W-3B		W-4			W-5			W-6		W-7
		NR 140 ES	NR140 PAL	5/27/24	10/6/21	5/27/24	10/8/21	5/25/23	5/28/24	10/8/21	5/25/23	5/29/24	10/8/21	5/28/24	10/8/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	<0.70	<0.59	<0.71	**88**	**18**	**53**	**120**	**190**	**240**	**240**	**630**	**490**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			<0.89	<0.84	<0.89	**120**	**130**	**190**	**140**	**250**	**130**	**4,000**	**2,200**	**400**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.71	<0.67	<0.71	*1.1 J*	<0.71	<0.75	<0.73	*4.0 J*	*4.9 J*	**9.3**	**28**	<0.73
NEtFOSA	4151-50-2			<1.1	<1.1	<1.2	<1.2	<1.1	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
NEtFOSAA	2991-50-6			<1.5	<0.59	<1.5	*14*	<1.5	<1.6	0.92 J	*3.0 J*	<1.6	**39**	**35**	0.95 J
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.87	<0.82	<0.87	*3.1* J	0.90 J	*3.6* J	**30**	**68**	**45**	*11*	*22*	2.7 J
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	<0.90	<0.35	<0.90	*28*	3.8 J	*5.4*	*25*	*20*	*17*	**450**	**1,900**	**110**
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.2	<1.1	<1.2	<1.2	<1.2	<1.2	3.5 J	1.8 J	2.5 J	8.3	<1.2	1.2 J
Perfluoroundecanoic acid (PFUnA)	2058-94-8	**3,000**	*600*	<0.97	<0.92	<0.98	<1.0	<0.97	<1.0	1.9 J	1.2 J	<1.0	2.2 J	<1.0	<1.00
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	<2.6	<2.4	<2.6	100	27	70	330	140	160	380	380	190
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	<1.2	<1.1	<1.2	160	6.6	6.4	340	200	240	390	380	220
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	<0.35	1.5 J	<0.35	130	180	110	34	19	14	370	240	500
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	<1.3	<1.2	<1.3	130	5.5	11	600	170	370	670	440	200
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	<1.7	<0.41	<1.7	89	3.6 J	3.3 J	210	120	210	180	210	64
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	<0.56	<0.52	<0.56	2.3 J	1.0 J	1.7 J	4.6 J	2.4 J	1.5 J	130	340	11
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	<0.57	<0.53	<0.57	3.3 J	0.9 J	1.8 J	1.5 J	2.3 J	1.1 J	38	52	6.2
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.50	<0.47	<0.50	0.90 J	<0.49	<0.52	1.2 J	<0.50	0.71 J	26	15	<0.51
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.4	<1.3	<1.4	<1.5	<1.3	<1.4	8.1	<1.4	<1.4	3.3 J	<1.5	<1.4
4:2 FTS	757124-72-4	NRS	NRS	<0.94	<0.88	<0.94	<1.00	<0.93	<0.99	<0.96	<0.95	<0.99	1.6 J	<0.99	<0.96
6:2 FTS	27619-97-2	NRS	NRS	<1.9	2.6 J	<1.9	<0.71	<1.9	<2.0	110	130	86	530	49	<0.68
8:2 FTS	39108-34-4	NRS	NRS	<1.1	<1.1	<1.1	<1.2	<1.1	<1.2	42	93	57	100	43	<1.2
NMeFOSAA	2355-31-9	NRS	NRS	<0.64	<0.61	<0.65	<0.69	<0.64	<0.68	<0.66	<0.65	0.83 J	20	14	<0.66
Total Concentration of All Detected PFAS Compounds				0.0	4.1	0.0	871.9	377.3	456	2,078	1,504	1,622	7,635	6,992	2,196

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-7		W-7A			W-17				W-17A		
		NR 140 ES	NR140 PAL	5/24/23	5/29/24	10/8/21	5/24/23	5/29/24	10/06/21	05/31/22	05/23/23	05/27/24	10/08/21	05/31/22	05/23/23
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**510**	**340**	**510**	**2,300**	**820**	**590**	**610**	**520**	**220**	**9,400**	**11,000**	**11,000**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**370**	**110**	**130**	**24**	**89**	**240**	**570**	**540**	**490**	**7.3**	**1.1**	<0.92
NEtFOSAA	2991-50-6	**20**[C2]	*2*[C2]	<1.7	<1.4	<0.60	<1.5	<1.4	<0.58	<1.7	<1.9	<1.7	0.64 J	<1.6	<1.6
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	2.0 J	0.83 J	<0.83	1.2 J	<0.81	*9.7*	*6.1*	*11*	*6.5*	<0.83	<0.88	<0.90
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**150**	**110**	**70**	**86**	*30*	**260**	**220**	**190**	**68**	**48**	**44**	**43**
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.3	<1.1	1.7 J	<1.1	<1.1	3.3 J	<1.3	<1.4	<1.3	<1.1	3.3	<1.2
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.3	<1.1	<1.2	<1.2	<1.2	<1.2	<1.4	<1.5	<1.3	<1.2	<1.2	<1.3
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	640	700	85	210	200	780	630	390	150	400	450	710
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	1200	1,100	170	150	150	1,100	740	360	170	520	470	420
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	500	470	140	350	110	410	410	190	99	150	160	670
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	1,700	2,000	130	350	480	740	590	250	120	340	320	370
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	120	160	43	65	20	400	240	120	73	510	630	410
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	11	12	5.9	6.8	2.9 J	86	87	30	12	27	23	21
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	2.8 J	0.83 J	13	2.4 J	2.3 J	9.9	14	5.5 J	4.3 J	<0.54	<0.57	<0.59
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.54	<0.46	<0.47	<0.47	<0.46	<0.46	<0.55	<0.61	<0.54	<0.48	<0.50	<0.51
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.5	<1.3	<1.3	<1.3	<1.3	<1.3	<1.5	<1.7	<1.5	<1.3	<1.4	<1.4
4:2 FTS	757124-72-4	NRS	NRS	2.0 J	<0.87	<0.89	<0.88	<0.87	3.6 J	<1.0	<1.1	<1.0	<0.90	<0.94	<0.97
6:2 FTS	27619-97-2	NRS	NRS	<2.1	66	1.5 J	<1.8	6.2	450	320	90	29	2.0 J	<1.9	<2.0
8:2 FTS	39108-34-4	NRS	NRS	<1.2	<1.0	<1.1	<1.1	<1.1	<1.1	<1.3	<1.4	<1.2	<1.1	<1.1	<1.2
NMeFOSAA	2355-31-9	NRS	NRS	<0.70	<0.60	<0.61	<0.61	<0.60	<0.60	<0.71	<0.79	<0.70	<0.62	<0.65	<0.67
Total Concentration of All Detected PFAS Compounds				5,208	5,070	1,300	3,547	1,910	5,083	4,437	2,697	1,442	11,405	13,101	13,644

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-17A	W-17B				W-18			W-18A			W-19R
		NR 140 ES	NR140 PAL	05/30/24	10/08/21	05/31/22	05/23/23	05/28/24	10/06/21	05/23/23	05/28/24	10/08/21	05/23/23	05/28/24	10/08/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**12,000**	**1,700**	**1,000**	**1,200**	**650**	**470**	**420**	**440**	**1,100**	**880**	**760**	**2,900**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**3.5**	**34**	**75**	**50**	**89**	**470**	**680**	**560**	**280**	**300**	**330**	**270**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.74	<0.72	<0.75	<0.75	<0.72	*6.6*	**43**	**32**	0.9 J	<2.9	<0.76	<0.70
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.90	*7.1*	2.6 J	*8.8*	*10*	*8.9*	*8.1*	*8.6*	*15*	*16* J	*18*	*13*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**60**	**270**	**250**	**310**	**230**	**400**	**210**	**170**	**420**	**370**	**350**	**870**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	6.9	2.6 J	4.3 J	<1.2	<1.2	4.2 J	1.8 J	4.3 J	2.6 J	<5.0	<1.3	1.3 J
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<0.72	<1.4	<0.73	<0.69	<0.70	<1.4	<0.80	<0.72	4.3 J	<4.7	<1.2	7.5
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	1,700	660	490	700	850	490	580	490	690	1,300	1,500	*2,500*
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	1,000	540	490	530	530	410	540	500	610	620	900	1,200
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	1,200	410	360	410	480	260	320	260	330	240	370	1,100
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	750	700	560	670	760	360	390	380	600	680	1000	940
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	340	140	130	100	130	240	170	200	210	110	200	380
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	34	130	110	160	130	97	40	33	88	57	72	340
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	<0.59	14	11	5.2	6.4	15	10	13	32	14 J	25	110
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.51	<0.50	<0.52	<0.49	<0.50	<0.49	<0.58	2.5 J	<0.51	<2.0	<0.53	<0.49
4:2 FTS	757124-72-4	NRS	NRS	<0.97	2.10 J	2.2 J	2.1 J	1.2 J	<0.92	1.1 J	<0.98	1.10 J	<3.8	<1.0	<0.93
6:2 FTS	27619-97-2	NRS	NRS	4.1 J	210	280	200	140	40	59	47	480	340	330	35
Total Concentration of All Detected PFAS Compounds				17,099	4,820	3,766	4,346	4,007	3,284	3,493	3,156	4,864	4,927	5,855	10,667

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-19R		W-26				W-27			W-28		
		NR 140 ES	NR140 PAL	05/23/23	05/30/24	10/08/21	05/31/22	05/23/23	05/29/24	10/08/21	05/22/23	05/29/24	10/06/21	05/23/23	05/28/24
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**610**	**400**	**310**	**240**	**380**	**210**	**1400**	**2100**	**1700**	**38**	**81**	**190**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**150**	**210**	**3.4**	**3.4**	**5.9**	**1.2 J**	**5.1**	**5.7**	**3.5**	**520**	**360**	**460**
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*7.1*	*6.5*	<0.82	<0.89	<0.89	<0.82	1.6 J	2.4 J	1.8 J	*4.8*	*7.8*	*14*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**350**	**200**	**79**	**59**	**130**	*36*	**230**	**410**	**240**	*20*	**90**	**210**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.3	<1.0	<1.2	<1.3	<1.3	<1.2	<1.3	<1.3	<1.2	2.9 J	1.2	1.6 J
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.2	<0.99	3.6 J	3.5 J	1.4 J	2.3 J	2.1 J	<1.2	<1.1	<1.1	<1.1	<1.2
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	900	500	*5,800*	*5,400*	*2,200*	*2,800*	540	1,300	430	38	56	140
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	410	210	300	260	200	200	390	670	390	22	57	190
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	490	290	320	320	390	320	390	680	280	230	240	260
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	330	160	260	260	200	230	500	770	510	40	60	240
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	120	75	110	110	64	82	150	240	110	12	25	100
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	94	60	38	25	45	19	110	170	130	5.3	6.9	17
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	20	26	1.9 J	1.6 J	2.8 J	<0.53	5.3	7.0	2.7 J	0.91 J	3.8 J	4.1 J
4:2 FTS	757124-72-4	NRS	NRS	<0.96	<0.79	<0.88	<0.96	<0.96	<0.88	1.8 J	3.0 J	3.5 J	<0.85	<0.91	<0.98
6:2 FTS	27619-97-2	NRS	NRS	18	19	4.9	5.8	<2.0	<1.8	15	40	190	1.3 J	2.7 J	6.4 J
Total Concentration of All Detected PFAS Compounds				3,499	2,157	7,231	6,688	3,619	3,901	3,741	6,398	3,992	936	991	1,834

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-29			W-30A				W-30B				W-31A
		NR 140 ES	NR140 PAL	10/06/21	05/23/23	05/30/24	05/01/21	05/31/22	05/22/23	05/28/24	05/02/21	05/31/22	05/22/23	05/28/24	06/02/22
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**720**	**490**	**170**	<0.81	<0.64	<0.74	<0.76	*1.5 J*	*1.2 J*	<0.73	<0.71	**520**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**860**	**570**	**320**	1.1 JJ	<0.91	<0.93	<0.97	*1.8 JJ*	*2.0*	<0.92	<0.90	**70**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	*1.3 J*	*9.6*	*3.1 J*	<0.93	<0.73	<0.74	<0.77	<0.94	<0.71	<0.73	<0.72	<0.74
NEtFOSA	4151-50-2			<1.1	<1.1	<1.2	<0.83	<1.2	<1.2	<1.2	<0.83	<1.1	<1.2	<1.2	<1.2
NEtFOSAA	2991-50-6			*3.4 J*	*3.6 J*	<1.7	<1.2	<1.6	<1.6	<1.7	<1.2	<1.5	<1.6	<1.6	*2.1 J*
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*11*	*9.4*	*8.8*	<0.26	<0.89	<0.91	<0.94	<0.26	<0.87	<0.90	<0.88	<0.90
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**420**	**300**	**41**	<0.54	0.93 J	<0.94	<0.98	<0.55	<0.90	<0.93	<0.91	**120**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	2.0 J	1.9 J	<1.3	<0.29	<1.3	<1.3	<1.3	0.32 J	<1.2	<1.3	<1.2	<1.3
HFPO-DA (GenX)	13252-13-6	**300**	*30*	6.6	1.5 J	<1.3	<1.4	<1.2	<1.2	<1.3	<1.4	<1.2	<1.2	<1.2	<1.2
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	910	530	81	<2.3	<2.7	<2.7	<2.8	<2.3	<2.6	<2.7	<2.6	140
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	1,000	610	94	0.61 J	<1.2	<1.3	<1.3	1.3 J	1.3 J	<1.2	<1.2	87
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	500	460	99	0.22 J	<0.36	<0.37	<0.38	0.46 J	0.41 J	<0.36	<0.35	150
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	640	450	54	0.8 J	<1.3	<1.3	<1.4	1.4 J	1.6 J	<1.3	<1.3	200
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	330	250	40	0.29 J	<1.8	<1.8	<1.9	0.27 J	<1.7	<1.8	<1.7	31
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	130	59	5.9	<0.29	<0.57	<0.58	<0.60	<0.29	<0.56	<0.57	<0.56	11
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	18	9.4	2.5 J	<0.18	<0.58	<0.59	<0.61	<0.18	<0.57	<0.58	<0.57	22
4:2 FTS	757124-72-4	NRS	NRS	1.8 J	<0.90	<0.90	<0.23	<0.96	<0.98	<1.0	<0.23	<0.94	<0.97	<0.94	<0.97
6:2 FTS	27619-97-2	NRS	NRS	190	48	2.4 J	<2.4	<2.0	<2.0	<2.1	3.8 J	2.3 J	<2.0	<1.9	10
8:2 FTS	39108-34-4	NRS	NRS	<1.1	1.9 J	<1.2	<0.44	<1.2	<1.2	<1.2	<0.44	<1.1	<1.2	<1.1	<1.2
NMeFOSAA	2355-31-9	NRS	NRS	0.89 J	1.7 J	<0.69	<1.1	<0.66	<0.67	<0.70	<1.1	<0.64	<0.67	<0.65	<0.67
NMeFOSE	24448-09-7	NRS	NRS	<0.46	<0.46	<0.46	<1.3	<1.5	<1.5	<1.6	<1.3	<1.5	<1.6	<1.5	<1.6
Total Concentration of All Detected PFAS Compounds				5,745	3,806	922	3.02	0.93	0.00	0.00	10.9	8.81	0.00	0.00	1,363

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-31A		W-31B			W-32			W-33			W-34
		NR 140 ES	NR140 PAL	05/23/23	05/29/24	06/02/22	05/23/23	05/29/24	06/01/22	05/24/23	05/30/24	06/01/22	05/23/23	05/29/24	06/01/22
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**190**	**450**	**11**	**10**	**7.0**	**7,500**	**890**	**3,300**	**1,400**	**2,300**	**650**	**1,900**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**160**	**160**	**60**	**71**	**58**	**24**	**190**	**150**	**1,600**	**730**	**1200**	**590**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.71	<0.77	<0.71	<0.74	<0.66	<3.6	<0.83	<1.4	**12**	**22**	**81**	<0.71
NEtFOSA	4151-50-2			*1.4 J*	<1.2	<1.1	<1.2	<1.1	<5.8	*6.5*	*4.0 J*	<1.2	**1.5 J**	<1.3	<1.2
NEtFOSAA	2991-50-6			*3.9 J*	*6.9*	<1.5	<1.6	<1.4	<7.7	<1.8	<3.1	**14**	**34**	**46**	<1.6
NEtFOSE	1691-99-2			<1.0	<1.1	<1.0	<1.1	<0.97	<5.2	<1.2	*3.6 J*	<1.1	<1.1	<1.2	<1.1
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	2.8 J	<0.94	<0.86	<0.91	<0.80	<4.3	1.0 J	*3.4* J	*7.7*	*10*	*12*	2.7 J
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**77**	**200**	*24*	*20*	*5.1*	**120**	*10*	**76**	**540**	**750**	**190**	**230**
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.2	<1.3	<1.2	<1.2	<1.1	<5.8	*57*	26	*33*	4.7 J	2.3 J	23
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	100	270	8.8	7.4	9.5	*2,300*	300	860	870	<2.9	790	*7,200*
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	40	120	8.2	8.9	7.1	1,400	96	350	1,300	820	1200	670
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	110	230	7.6	7.1	6.9	4,000	120	540	830	1,500	350	12,000
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	63	230	12	9.9	9.6	460	240	520	1,500	1,800	620	1,000
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	16	38	2.1 J	<1.8	<1.6	600	52	140	550	400	450	300
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	5.3	9.6	1.1 J	0.80 J	0.58 J	170	2.2 J	44	85	160	51	450
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	4.2 J	12	6.2	5.3	1.8 J	14 J	3.0 J	6.2 J	23	28	13	24
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.50	<0.54	<0.49	<0.52	<0.46	<2.5	<0.58	<0.99	2.7 J	<0.54	3.9 J	3.1 J
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.4	<1.5	<1.4	<1.4	<1.3	<6.8	<1.6	<2.7	4.4 J	<1.5	<1.6	<1.4
4:2 FTS	757124-72-4	NRS	NRS	<0.94	<1.0	<0.93	<0.98	<0.87	<4.7	27	52	4.1 J	1.6 J	1.5 J	0.98 J
6:2 FTS	27619-97-2	NRS	NRS	6	14	<1.9	<2.0	<1.8	13 J	<2.2	24	660	210	130	27
Total Concentration of All Detected PFAS Compounds				780	1,741	145	140	106	16,608	1,997	6,099	9,500	8,808	5,850	24,425

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		W-34		W-35			MW-104				MW-104A		
		NR 140 ES	NR140 PAL	05/23/23	05/29/24	06/01/22	05/24/23	05/29/24	10/06/21	05/31/22	05/23/23	05/28/24	10/06/21	05/31/22	05/23/23
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**4,700**	**1500**	**1,400**	**360**	**390**	**43**	**41**	**48**	**44**	**80**	**91**	**77**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**450**	**450**	**41**	**26**	**9.1**	**1.2 J**	**1.6 J**	**5.3**	**74**	**10**	**13**	**11**
NEtFOSA	4151-50-2	**20**[C2]	*2*[C2]	*1.8 J*	<1.1	<1.3	*1.5 J*	<1.1 J	<1.1	<1.2	<1.2	<1.1	<1.1	<1.2	<1.2
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*22*	*15*	1.1 J	2.4 J	2.1 J	<0.84	<0.91	<0.92	<0.87	<0.84	<0.90	<0.89
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**530**	*140*	**110**	*31*	**79**	*26*	*20*	*18*	*13*	*9.3*	*17*	*16*
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	1.9 J	<1.2 J	<1.4	<1.3	<1.2	<1.2	<1.3	<1.3	<1.2	<1.2	<1.3	<1.3
HFPO-DA (GenX)	13252-13-6	**300**	*30*	6.7	15	<1.3	<1.2	6.6	<1.1	<1.2	<1.2	<1.2	<1.1	<1.2	<1.2
DONA	919005-14-4	**3,000**	*600*	<0.63	0.63 J	<0.61	<0.59	<0.54	<0.54	<0.59	<0.59	<0.56	<0.54	<0.58	<0.57
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	*6,800*	*4,400*	250	380	320	52	120	37	26	190	300	270
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	1,500	520	250	400	750	96	120	36	27	48	110	79
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	12,000	33,000	230	80	120	37	64	69	17	57	110	110
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	1,800	1500	660	830	1300	53	91	29	20	75	140	140
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	540	180	83	16	51	22	20	8.5	9.9	7.7	18	9.1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	280	250	5.1 J	1.6 J	3.4 J	5.1	11	9.8	2.7 J	7.2	11	10
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	13	16	88	11	15	<0.55	<0.59	1.0 J	0.93 J	0.72 J	0.59 J	0.58
4:2 FTS	757124-72-4	NRS	NRS	3.5 J	2.8 J	18	22	39	<0.91	<0.98	<0.99	<0.93	<0.90	<0.96	<0.96
6:2 FTS	27619-97-2	NRS	NRS	130	84	1,200	180	280	<0.64	<2.0	<2.0	<1.9	<0.64	<2.0	<2.0
Total Concentration of All Detected PFAS Compounds				28,779	42,073	4,336	2,342	3,365	335	489	262	235	485	811	723

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-104A	MW-106			MW-106A			MW-111				MW-111A
		NR 140 ES	NR140 PAL	05/28/24	10/06/21	05/22/23	05/28/24	10/06/21	05/22/23	05/28/24	10/06/21	05/31/22	05/23/23	05/28/24	10/06/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2* [C1]	**93**	*1.4* J	<0.71	0.70 J	*3.1*	*2.3*	1.6 J	*2.1*	*10*	*15*	**28**	**510**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**9.6**	*1.2* J	<0.90	<0.85	*1.1* J	<0.86	<0.84	<0.86	<0.92	<0.96	<0.86	<0.86
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	*18*	1.5 J	2.9 J	2.6 J	*7.7*	*6.7*	*6.0*	<0.36	0.95 J	1.9 J	1.7 J	*6.2*
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	360	34	23	16	110	72	38	<2.5	6.3	7.9	6.8	430
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	180	3 J	<1.2	<1.1	16	14	7.8	<1.2	5.3	6.6	8.0	280
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	240	4.8	6.0	5.0	6.5	4.6 J	3.3 J	<0.34	5.0 J	6.0	5.8	6.1
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	240	2.7 J	<1.2	<1.2	25	19	8.5	<1.2	4.6 J	5.0 J	4.6 J	240
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	23	0.49 J	<1.7	<1.6	2.6 J	<1.7	<1.6	<0.43	<1.8	<1.9	2.4 J	78
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	19	1.0 J	0.61 J	<0.53 J	4.0 J	1.7 J	2.0 J	<0.54	0.69 J	0.75 J	1.2 J	3.6 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	<0.56	<0.52	<0.57	<0.54	<0.53	<0.55	<0.54	<0.55	<0.58	<0.61	<0.55	<0.54
6:2 FTS	27619-97-2	NRS	NRS	<1.9	13	<1.9	<1.8	2.2 J	<1.9	<1.8	0.73 J	<2.0	<2.1	<1.8	0.7 J
Total Concentration of All Detected PFAS Compounds				1,183	63	33	24.3	178	120	67	2.83	33	43	59	1,555

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-111A			MW-111B				MW-112				MW-112A
		NR 140 ES	NR140 PAL	05/31/22	05/23/23	05/28/24	10/06/21	05/31/22	05/23/23	05/28/24	05/01/21	05/31/22	05/22/23	05/28/24	05/01/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2* [C1]	**480**	**3,500**	**5,900**	**51**	*11*	*13*	*14*	<0.83	*4.4*	1.1 J	1.1 J	**110**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			<1.0	<0.90	<0.89	**7.1**	<0.86	<1.1	*1.8* J	<0.53	<0.88	<0.87	<0.84	**16** I
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2* [C2]	<0.81	<0.72	<0.71	<0.66	<0.68	<0.90	<0.68	1.5 J	<0.70	<0.69	<0.67	<0.91
NEtFOSA	4151-50-2			<1.3	<1.2	<1.1	<1.1	<1.1	<1.5	<1.1	<0.85	<1.1	<1.1	1.3 J	<0.81
NEtFOSAA	2991-50-6			<1.8	<1.6	<1.5	0.6 J	<1.5	<2.0	<1.5	<1.3	<1.5	<1.5	<1.5	<1.2
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.99	<0.88	<0.87	0.95 J	<0.84	<1.1	<0.83	<0.26	<0.86	<0.85	<0.82	2.6
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	*10*	*18*	*31*	2.7 J	1.1 J	1.5 J	1.2 J	<0.56	1.0 J	<0.88	<0.86	*25*
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.4	<1.3	<1.2	2.1 J	<1.2	<1.6	<1.2	0.31 J	<1.2	<1.2	<1.2	0.39 J
HFPO-DA (GenX)	13252-13-6	**300**	*30*	2.8 J	<1.2	<1.2	<1.1	<1.1	<1.5	<1.1	<1.5	1.5 J	<1.1	<1.1	<1.4
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	790	580	520	140	20	19	22	<2.3	3.4 J	<2.5	4.9	140
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	630	620	320	81	7.8	7.9	9.1	<0.57	1.9 J	<1.2	1.2 J	51
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	9.7	9.8	19	4.6 J	1.1 J	1.7 J	1.7 J	0.19 JI	5.6	0.94 J	3.7 J	44
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	510	420	300	76	7.3	7.6	9.1	<0.48	1.8 J	<1.2	2.0 J	79
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	190	330	130	14	<1.7	<2.2	1.9 J	<0.24	<1.7	<1.7	<1.6	14
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	3.9 J	10	6.6	1.2 J	<0.54	<0.71	<0.53	<0.29	<0.55	<0.54	<0.53	10
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	<0.65	<0.57	<0.56	<0.53	<0.54	<0.72	<0.54	<0.19	<0.56	<0.55	<0.54	0.91 JI
6:2 FTS	27619-97-2	NRS	NRS	<2.2	<1.9	5.0	22	<1.8	<2.4	2.3 J	<2.4	<1.9	<1.9	<1.8	2.8 J
NMeFOSAA	2355-31-9	NRS	NRS	<0.73	<0.65	<0.64	1.6 J	<0.62	<0.82	0.73 J	<1.2	<0.64	<0.63	<0.61	<1.1
Total Concentration of All Detected PFAS Compounds				2,626	5,488	7,232	405	48	51	64	2.0	20	2.0	14	496

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-112A			MW-112B				MW-113		MW-113A		MW-113B
		NR 140 ES	NR140 PAL	05/31/22	05/22/23	05/28/24	05/01/21	05/31/22	05/22/23	05/28/24	05/01/21	05/29/24	05/01/21	05/29/24	05/01/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**150**	**180**	**180**	**38**	**33**	**63**	**140**	<0.79	<0.76	**32**	<0.74	*4.4*
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**20**	**14**	**24**	**3.6 I**	**1.6 J**	<0.91	<0.84	<0.50	<0.96	<27 G	<0.94	<3.2 G
NEtFOSA	4151-50-2	**20**[C2]	*2*[C2]	<1.2	<1.4	1.5 J	<0.81	<1.1	<1.1	<1.1	<0.80	<1.2	<0.81	<1.2	<0.82
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.89	2.5 J	*4.6* J	<0.25	<0.86	<0.89	<0.82	<0.25	<0.94	<0.25	<0.91	<0.25
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**48**	**70**	**73**	*8.1* I	*8.4*	*38*	**57**	<0.53	<0.97	*4.0*	<0.95	1.5 J
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.3	<1.5	<1.3	0.4 J	<1.2	<1.3	<1.2	<0.29	<1.3	0.32 J	<1.3	0.31 J
HFPO-DA (GenX)	13252-13-6	**300**	*30*	2.1 J	<1.4 J	<1.2	<1.4	<1.2	<1.2	<1.1	<1.4	<1.3	<1.4	<1.2	<1.4
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	180	170	170	1,800	1,800	890	470	<2.2	<2.8	<2.2	<2.7	<2.3
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	88	80	130	150	200	170	140	<0.54	<1.3	0.57 JI	<1.3	2.0
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	180	290	170	62	69	120	100	<0.19	<0.38	1.7 J	<0.37	0.78 J
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	110	85	120	270	280	240	210	<0.45	<1.4	1.5 J	<1.3	7.8
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	25	19	33	27	34	47	53	<0.23	<1.9	0.49 JI	<1.8	0.68 J
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	19	19	15	9.2 I	10	22	22	<0.28	<0.60	<0.28	<0.58	<0.28
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	1.7 J	<0.69	1.6 J	<0.18	<0.56	<0.58	<0.58	<0.18	<0.61	2.6	<0.59	<0.18
6:2 FTS	27619-97-2	NRS	NRS	<2.0	<2.3	<2.0	<2.3	<1.9	<2.0	<2.0	<2.3	<2.1	<2.3	<2.0	4.4 J
NMeFOSAA	2355-31-9	NRS	NRS	<0.66	<0.78	<0.67	<1.1	<0.64	<0.66	<0.66	<1.1	<0.69	<1.1	<0.68	<1.1
Total Concentration of All Detected PFAS Compounds				824	930	923	2,368	2,436	1,590	1,192	0.0	0.0	43	0.0	22

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-113B	MW-114				MW-114A				MW-114B	MW-115	
		NR 140 ES	NR140 PAL	05/29/24	10/06/21	06/01/22	05/23/23	05/28/24	10/06/21	06/01/22	05/23/23	05/28/24	10/06/21	05/01/21	10/08/21
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	<0.63	**220**	**200**	**250**	**280**	**33**	**32**	**31**	**37**	*5.7*	**4,400**	**5,600**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			<0.80	**38**	**44**	**64**	**60**	**28**	**24**	**6.2**	**28**	*13*	<0.50	**2.0 J**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.64	<0.66	<0.72	<0.76	<0.68	<0.67	1.2 J	0.92 J	*2.1* J	0.77 J	<0.90	<0.75
NEtFOSA	4151-50-2			<1.0	<1.1	<1.2	<1.2	1.5 J	<1.1	<1.2	<1.2	<1.1	<1.1	<0.80	<1.2
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	<0.78	*17*	*5.6*	*18*	**33**	1.2 J	<0.88	<0.86	1.3 J	<0.81	<0.25	<0.91
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	<0.81	**48**	**63**	**120**	**170**	*26*	*32*	**55**	*33*	1.9 J	*29*	*33*
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.1	<1.2	<1.3	<1.3	<1.2	1.7 J	<1.3	<1.2	1.8 J	1.50 J	<0.29	<1.3
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.1	1.8 J	3.3 J	<1.3	<1.1	6.2	4.9 J	<1.2	2.8 J	<1.1	<1.4	<1.2
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	<2.3	980	1,300	1,200	1,200	52	63	61	56	3.8 J	1,400	1,700
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	<1.1	410	630	490	740	31	34	22	34	7.6	250	390
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	<0.32	310	430	460	650	40	47	40	41	1.5 J	610 I	620
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	<1.1	620	34	620	800	35	19	19	34	14	240	300
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	<1.6	94	5.5	94	180	6.0	2.6 J	2.6 J	6.0	1.6 J	180	230
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	<0.50	59	22	59	75	23	28	28	26	<0.52	18 I	19
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	<0.51	4.2	<0.54	4.2 J	3.7 J	0.74 J	<0.56	<0.56	<0.54	<0.53	<0.18	<0.59
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.45	<0.53	<0.47	<0.53	<0.47	<0.50	<0.49	<0.49	<0.47	<0.46	<0.34	0.65 J
6:2 FTS	27619-97-2	NRS	NRS	<1.7	4.2	6.5	4.2 J	<1.8	6.5	<1.9	<1.9	2.6 J	2.3 J	<2.3	1.6 J
NMeFOSAA	2355-31-9	NRS	NRS	<0.58	<0.69	0.7 J	<0.69	<0.61	1.7	1.4	1.4 J	1.0 J	1.2 J	<1.1	<0.68
Total Concentration of All Detected PFAS Compounds				0	2,806	2,745	3,383	4,193	292	289	267	307	55	7,127	8,896

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-115			MW-115A					MW-115B			
		NR 140 ES	NR140 PAL	05/31/22	05/23/23	05/30/24	05/01/21	10/08/21	05/31/22	05/23/23	05/30/24	05/01/21	10/08/21	05/23/23	05/28/24
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2* [C1]	**5,000**	**4,500**	**4,600**	**230**	**210**	**260**	**380**	**360**	<0.81	**210**	0.73 J	1.3 J
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			<0.88 J	<0.88	**0.91 J**	<10	**4.3**	**3.0**	**5.7**	**5.7**	<0.51	**4.3**	<0.87	<0.83
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	*35*	*27*	*29*	*37*	*18*	*29*	**54**	*23*	*11*	*18*	*4.0 J*	*13*
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.2	<1.2	<1.1	<5.7	<1.2	<1.2	<1.4	<1.1	<0.30	<1.2	<1.2	<1.1
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.2	<1.2	<1.1	<28	3.5 J	3.6 J	<1.3 J	<1.1	<1.4	3.5 J	<1.1	<1.1
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	1,900	*2,100*	*2,800*	1,600	1,400	970	1,300	1,100	4.5 J	1,400	2.7 J	6.1
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	390	300	460	1,000	900	660	430	440	5.2	900	3.1 J	4.0 J
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	890	370	850	3,400 I	3,000	2,300	630	800	1.9	3,000	0.84 J	2.2 J
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	280	300	470	670	590	410	300	300	3.5	590	2.6 J	3.5 J
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	200	130	150	190	190	210	91	93	0.61 J	190	<1.7	<1.6
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	17	11	18	71 I	55	67	44	27	3.0	55	0.63 J	1.6 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	0.66 J	0.92 J	<0.51	<3.5	1.50 J	1.6 J	2.6 J	1.2 J	<0.18	1.5 J	<0.55	<0.52
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.49	<0.49	<0.45	<6.9	<0.48	<0.48	<0.57	<0.45	<0.35	<0.48	<0.49	<0.46
6:2 FTS	27619-97-2	NRS	NRS	<1.9 J	<1.9	<1.7	<46	3.1 J	4.3 J	13	11	<2.4	3.1 J	<1.9	<1.8
Total Concentration of All Detected PFAS Compounds				8,713	7,739	9,378	7,198	6,375	4,919	3,250	3,161	30	6,375	15	32

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		MW-116			AS-1			TW-1		MP-1	SVE-4		SVE-5
		NR 140 ES	NR140 PAL	10/6/21	5/23/23	5/28/24	4/15/21	5/25/23	5/30/24	05/24/23	05/30/24	05/24/23	08/16/23	05/09/24	08/16/23
PFAS Compounds with Recommended Standards															
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**350**	**210**	**14**	**310**	**800**	**440**	**480**	**490**	**440**	**3,000**	**150**	**490**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**390**	**740**	**30**	**1,400** I	**5,200**	**2,900**	**2,300**	**2,500**	**4.1**	**220**	**190**	**870**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	<0.67	<0.79	<0.73	**72**	**390**	**400**	**110**	**110**	<0.75	**170**	**320**	**78**
NEtFOSA	4151-50-2			<1.1	<1.3	<1.2	**34**	**140**	**57**	**1.5** J	**1.9** J	<1.2	**8.7**	**14**	<1.1
NEtFOSAA	2991-50-6			<0.59	<1.7	<1.6	**710**	**1,200**	**490**	**66**	**130**	<1.6	**2.5** J	**5.2**	**130**
NEtFOSE	1691-99-2			<0.49	<1.2	<1.1	<0.83	**1.7** J	**1.4** J	**1.7** J	**2.3** J	<1.1	<1.1	<1.1	<1.0
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*6.8*	*4.8* J	<0.90	*22*	**80**	**35**	*19*	**38**	<0.92	*6.8*	*3.3* J	*12*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**150**	**210**	*24*	**350**	**660**	**520**	**260**	**440**	**63**	**1,200**	*24*	**270**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.2	<1.4	<1.3	29	42	19	13	22	<1.3	<1.3	5.1 J	7.1
Perfluorododecanoic acid (PFDoA)	307-55-1	**500**	*100*	<1.3	<0.76	<0.71	<0.54	<0.70	<0.78	<0.72	<0.72	<0.73	<0.70	1.7 J	<0.69
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.1	<1.3	<1.2	1.6 I	8.5	3.3 J	2.8 J	<1.2	3.0 J	16	8.9	1.5 J
Perfluoroundecanoic acid (PFUnA)	2058-94-8	**3,000**	*600*	<0.92	<1.1	<1.0	1.9	<0.99	2.1 J	1.2 J	3.0 J	<1.0	<0.98	<1.0	<0.97
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	300	160	18	620	1,100	460	490	440	1,500	**12,000**	*4,800*	770
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	390	210	19	500	840	370	470	440	230	1,700	990	870
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	190	180	19	4,400	1,500	490	270	250	1,900	20,000	5,500	430
PFAS Compounds without Recommended Standards															
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	320	140	16	1,000	1,600	530	420	430	710	3,000	2,100	420
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	120	55	5.9	150	480	250	200	310	130	2,600	70	410
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	43	29	2.5 J	42	120	87	38	59	10	2,400	310	68
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	6.4	3.0 J	<0.58	16	110	36	19	28	<0.60	50	13	14
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.47	<0.55	<0.51	1.8 JI	1.4 J	9.6 J	1.3 J	8.5	<0.52	1.10 J	<0.52	0.80 J
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.3	<1.5	<1.4	<0.31	<1.4	<1.6	<1.4	2.4 J	<1.4	<1.4	<1.4	<1.4
4:2 FTS	757124-72-4	NRS	NRS	<0.88	<1.0	<0.97	0.62 J	<0.95	<1.1	<1.4	<0.98	6.2	<0.94	1.7 J	1.10 J
6:2 FTS	27619-97-2	NRS	NRS	190	18	2.0 J	200	33	40	83	39	<2.0	12	<2.0	99
8:2 FTS	39108-34-4	NRS	NRS	<1.1	<1.3	<1.2	20.0	55	16	19	25	<1.2	<1.1	<1.2	38
NMeFOSA	31506-32-8	NRS	NRS	<0.75	<0.88	<0.82	<0.42	2.6 J	1.7 J J	<0.83	<0.83	<0.84	20	61	<0.79
NMeFOSAA	2355-31-9	NRS	NRS	<0.61	<0.71	<0.66	16	35	55	41	68	<0.68	17	25	39
Total Concentration of All Detected PFAS Compounds				2,456	1,960	150	9,897	14,399	7,211	5,307	5,835	4,996	46,424	14,593	5,019

TABLE 8

SUMMARY OF PFAS DETECTED IN GROUNDWATER MONITORING WELL SAMPLES (APRIL 2021 - MAY 2024)

PFAS Compound by Group	CAS Number	WI DHS/WDNR Recommended PFAS Standard (ng/ℓ)		SVE-6	SVE-7
		NR 140 ES	NR140 PAL	08/16/23	08/16/23
PFAS Compounds with Recommended Standards					
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2* [C1]	**69**	**360**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**51**	**240**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2* [C2]	1.5 J	**16**
NEtFOSA	4151-50-2			<1.2	**8.4**
NEtFOSAA	2991-50-6			<1.6	**31**
NEtFOSE	1691-99-2			<1.1	**1.6 J**
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	1.2 J	2.1 J
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	*18*	*26*
HFPO-DA (GenX)	13252-13-6	**300**	*30*	<1.2	2.8 J
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	40	**33,000**
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	29	4,400
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	19	920
PFAS Compounds without Recommended Standards					
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	50	4,000
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	17	380
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	1.7 J	52
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	1.8 J	4.9 J
NMeFOSAA	2355-31-9	NRS	NRS	<0.65	1 J
Total Concentration of All Detected PFAS Compounds				299	43,446

NOTES:

Concentrations are in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).

Detected concentrations at or above a recommended NR 140 PAL are italicized; those at or above a recommended NR 140 ES are bold.

Samples collected in 4/21 and 5/21 were analyzed by Eurofins Laboratory of Sacramento, California. Samples collected in 10/21 and 11/21 were analyzed by ALS Laboratory of Holland, Michigan.

All samples analyzed using Method 537 Modified. Only compounds detected in one or more samples within each section of table are shown. All other compounds not listed in each section were not detected in those samples.

C1 = The WDNR proposed a ES abd PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.

Detected concentrations at or above a recommended NR 140 PAL are *italicized*; those at or above a recommended NR 140 ES are **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

G = The reported quantification limit has been raised due to an exhibited elevated noise or matrix interference.

I = Value is EMPC (estimated maximum possible concentration).

J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL), and the concentration is an approximate value.

NRS = No recommended standard in Cycle 11.

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EAU CLAIRE, WISCONSIN

TABLE 9

SUMMARY OF PFAS DETECTED IN RECOVERY WELL SAMPLES (APRIL 2021 - JUNE 2024)

PFAS Compound by Group	CAS Number	WI DHS Recommended PFAS Standard (ng/ℓ)		RW-2			RW-4		RW-5			RW-6		RW-7
		NR 140 ES	NR140 PAL	10/8/21	4/22/22	5/25/23	4/22/22	5/25/23	10/8/21	4/22/22	5/25/23	4/15/21	5/25/23	4/22/22
PFAS Compounds with Recommended Standards														
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**8,800**	**16,000**	**15,000**	**3,600**	**1,700**	**37,000**	**14,000**	**1,000**	**2,500**	**1,200**	**1,000**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**2,800**	**8,600**	**3,800**	**3,600**	**3,400**	**39,000**	**27,000**	**12,000**	**1,300 I**	**950**	**130**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	*1.5 J*	<1,000	*4.0 J*	*5.0 J*	*13*	**500**	**1,000**	**980**	<0.93	**0.77 J**	<4.4
NEtFOSA	4151-50-2			<1.1	<1,000	*1.4 J*	<25	*1.6 J*	**170**	**120**	**180**	<0.82	<1.2	<4.4
NEtFOSAA	2991-50-6			*0.74 J*	<1,000	<1.6	<25	*2.2 J*	**3,400**	**3,700**	**15,000**	<1.2	**33**	*16*
NEtFOSE	1691-99-2			*1.0 J*	<1,000	<1.1	<25	*1.1 J*	**20**	**16**	**170**	<0.81	<1.1	<4.4
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	**38**	<1,000	**75**	**31**	**30**	**290**	**140**	**42**	*27*	**30**	*29*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**4,500**	**8,600**	**7,000**	**4,300**	**2,100**	**8,700**	**5,700**	**2,600**	**1,000**	**480**	**1,300**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	6.3	<1,000	7	7.3 J	7.0	27	20	14	0.97 J	<1.3	<1.2
HFPO-DA (GenX)	13252-13-6	**300**	*30*	7.6	<1,000	5.2	2.8 J	1.3 J	*41*	14	2.1 J	2.7 J	1.8 J	1.5 J
Perfluoroundecanoic acid (PFUnA)	2058-94-8	**3,000**	*600*	<0.94	<1,000	<0.98	<7.5	<0.97	1.0 J	<1.5	<0.96	<1.0	<1.1	<1.5
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	*2,000*	*4,500*	**31,000**	*2,100*	*1,200*	**18,000**	**16,000**	**1,900**	*6,300*	*2,200*	1,400
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	2,400	5,500	30,000	1,500	1,100	5,200	5,900	1,600	3,600	900	990
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	1,800	3,600	28,000	8,100	3,000	11,000	20,000	3,200	1,400	610	430
PFAS Compounds without Recommended Standards														
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	1,400	3,700	29,000	1,100	1,100	6,700	6,200	1,300	3,300	1,000	1,200
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	1,800	3,000	3,700	870	450	1,800	1,400	290	780	220	200
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	760	1,900	1,700	2,700	430	1,700	2,400	1,000	440	160	360
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	260	<1,000	130	190	100	2,200	750	200	63 I	25	21 J
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	18	<1,000	3.0 J	<15	<0.50	260	<59	1.2 J	<0.35	<0.54	<0.59
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	24	<1,000	16	<7.5	<1.4	12	<30	5	<0.3	<1.5	<0.30
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	NRS	NRS	<1.4	NA	<0.63	NA	<0.62	<1.5	NA	<0.61	<0.92	<0.68	NA
4:2 FTS	757124-72-4	NRS	NRS	1.7 J	<1,000	3.4 J	NA	2.0 J	<0.99	<0.81	<0.92	1.4 J	1.3 J	<4.1
6:2 FTS	27619-97-2	NRS	NRS	15	<1,000	27	260	200	250	200	130	160	73	400
8:2 FTS	39108-34-4	NRS	NRS	1.2 J	<1,000	2.0 J	12 J	14	2.2 J	3.3 J	62	3.1	7.0	<0.15
NMeFOSA	31506-32-8	NRS	NRS	2.8 J	<1,000	<0.80	<2.3	<0.79	<0.84	1.5 J	6.7	<0.41	<0.86	<0.46
NMeFOSAA	2355-31-9	NRS	NRS	<0.62	<1,000	<0.65	5.8 J	1.2 J	62	67	110	<1.1	0.77 J	<1.4

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TABLE 9

SUMMARY OF PFAS DETECTED IN RECOVERY WELL SAMPLES (APRIL 2021 - JUNE 2024)

PFAS Compound by Group	CAS Number	WI DHS Recommended PFAS Standard (ng/ℓ)		RW-10				RW-11			RW-12		RW-13	
		NR 140 ES	NR140 PAL	11/18/21	12/5/22	5/25/23	6/26/24	4/15/21	5/25/23	6/26/24	4/15/21	5/25/23	11/18/21	5/25/23
PFAS Compounds with Recommended Standards														
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**2,500**	**920**	**870**	**1,100**	**1,100**	**630**	**390**	**3,800**	**4,400**	**2,300**	**1,300**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**220**	**130**	**190**	**130**	**2,300**	**1,200**	**1,400**	**1,600 I**	**4,100**	**1,200**	**830**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	**1.4 J**	< 0.71	**1.2 J**	**1.7 J**	**55**	**120**	**100**	**4.1**	**9.1**	*3.5 J*	*7.9*
NEtFOSA	4151-50-2			**5.0**	<1.1	**3.9 J**	**3.1 J**	<0.82	**1.5 J**	1.3 J	<0.83	<1.1	<1.3	<1.3
NEtFOSAA	2991-50-6			**150**	**24**	**91**	**110**	**120**	**53**	**110**	**16**	**35**	*8.9*	*7.3*
NEtFOSE	1691-99-2			**44**	**3.6 J**	**21.0**	**19**	**2.7**	**2.3 J**	*5.8*	<0.81	<1.0	<0.56	<1.1
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*3.5 J*	1.6 J	2.7 J	*3.0 J*	*29*	*23*	*27*	*23*	**51**	*20*	*22*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**460**	170	**130**	**73**	**620**	**370**	**280**	**1,100**	**1,000**	**510**	**360**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	<1.2	<1.2	<1.3	<1.2	20	20	12	7.2	14	5.4 J	2.8 J
HFPO-DA (GenX)	13252-13-6	**300**	*30*	3.8 J	2.2 J	2.4 J	3.8 J	2.2 J	2.2 J	2.1 J	1.6 J	3.1 J	<1.3	1.5 J
Perfluoroundecanoic acid (PFUnA)	2058-94-8	**3,000**	*600*	<0.96	<0.97	<0.98	<0.96	1.8 J	2.5 J	4.9	<1.0	<0.93	<1.1	<1.1
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	1,000	340	420	680	940	800	250	*2,300*	*3,400*	*2,400*	1,300
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	610	180	150	310	1,500	680	460	5,300	4,900	4,100	1,100
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	1,100	380	430	980	600	340	230	1,200	1,800	690	440
PFAS Compounds without Recommended Standards														
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	550	230	260	770	1,200	610	310	1,600	2,000	1,100	700
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	420	100	52	88	480	280	340	2,600	2,000	1,300	370
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	68	14	10	10	120	64	57	240 I	170	170	62
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	22	8.5	6.3	5.8	40	21	17	96 I	71	58	19
Perfluorononanesulfonic acid (PFNS)	68259-12-1	NRS	NRS	<0.49	<0.49	<0.50	<0.49	1.3 JI	0.64 J	4.8 J	<0.35	0.53 J	1.7 J	<0.54
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<1.3	<1.4	<1.4	<1.4	1.3 JI	<1.5	<1.3	<0.3	<1.3	<1.5	<1.5
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	NRS	NRS	< 1.4	<0.62	<0.63	2.3 J	<0.92	<0.70	<0.60	<0.92	<0.60	< 1.6	<0.68
4:2 FTS	757124-72-4	NRS	NRS	3.3 J	<0.93	1.2 J	<0.93	2.2 I	<1.1	0.95 J	8.5	7.1	1.6 J	1.1 J
6:2 FTS	27619-97-2	NRS	NRS	310	78	81	110	520	170	95	180	330	170	190
8:2 FTS	39108-34-4	NRS	NRS	<1.1	<1.1	<1.1	<1.1	22	15	15	12	35	9.2	12
NMeFOSA	31506-32-8	NRS	NRS	<0.78	<0.79	<0.80	<0.78	<0.41	<0.90	<0.76	<0.41	<0.76	<0.87	<0.86

NOTES:

Concentrations are in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).

All samples analyzed using Method 537 Modified. Only compounds detected in one or more samples are shown in this table.

C1 = The WDNR proposed a ES abd PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.

Detected concentrations at or above a recommended NR 140 PAL are *italicized* ; those at or above a recommended NR 140 ES are **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

I = Value is EMPC (estimated maximum possible concentration).

J = Result is less than the RL but greater than or equal to the MDL, and the concentration is an approximate value.

NRS = No recommended standard in Cycle 11.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 10

SUMMARY OF PFAS COMPOUNDS DETECTED IN SURFACE WATER SAMPLES (JUNE 2022 - JUNE 2024)

Grouping	CAS Number	Seep 2N			SW-1			SW-2			Non-Drinking Surface
PFAS Compound		6/1/22	5/24/23	6/26/24	6/1/22	5/24/23	6/26/24	6/1/22	5/24/23	6/26/24	Water Standard (ng/ℓ)
Carboxylic Acids (PFCA)											
Perfluorobutanoic acid (PFBA)	375-22-4	12	32	6.9	5.5	5.1 J	8.0	5.5	4.5 J	7.3	No recommended surface water standard
Perfluoropentanoic acid (PFPeA)	2706-90-3	5.3	21	<1.2	1.8 J	2.4 J	3.8 J	2.6 J	2.0 J	3.8 J	"
Perfluorohexanoic acid (PFHxA)	307-24-4	6.2	19	<1.2	2.1 J	2.5 J	2.3 J	2.0 J	2.0 J	2.3 J	"
Perfluoroheptanoic acid (PFHpA)	375-85-9	<1.8	4.2 J	<1.7	2.8 J	2.4 J	3.8 J	2.5 J	1.9 J	3.9 J	"
Perfluorooctanoic acid (PFOA)	335-67-1	11	38	0.76 J	8.9	9.0	9.2	9.3	7.4	7.4	95
Sulfonic Acids (PFSA)											
Perfluorobutanesulfonic acid (PFBS)	375-73-5	8.0	23	0.56 J	1.0 J	1.2 J	1.1 J	1.2 J	1.1 J	1.4 J	No recommended surface water standard
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	1.0 J	3.5 J	<0.54	<0.58	<0.62	<0.59	<0.54	<0.53	<0.51	"
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	<0.92	4.3 J	<0.87	1.4 J	2.1 J	0.99 J	1.3 J	1.5 J	0.94 J	"
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	<0.91	<0.99	<0.86	1.8 J	3.6 J	2.3	2.4	2.7	2.2	8

Grouping	CAS Number	SW-3			SW-4			SW-5			Non-Drinking Surface
PFAS Compound		6/1/22	5/24/23	6/26/24	6/1/22	5/24/23	6/26/24	6/1/22	5/24/23	6/26/24	Water Standard (ng/ℓ)
Carboxylic Acids (PFCA)											
Perfluorobutanoic acid (PFBA)	375-22-4	13	11	11	9.0	8.7	11	8.8	7.3	11	No recommended surface water standard
Perfluoropentanoic acid (PFPeA)	2706-90-3	4.9 J	5.1 J	5.5	3.2 J	3.3 J	5.1	3.3 J	3.3 J	4.9	"
Perfluorohexanoic acid (PFHxA)	307-24-4	5.4	4.0 J	3.3 J	3.6 J	2.8 J	3.3 J	3.2 J	2.8 J	2.8 J	"
Perfluoroheptanoic acid (PFHpA)	375-85-9	3.4 J	2.4 J	3.5 J	3.8 J	2.2 J	3.3 J	3.2 J	2.1 J	3.8 J	"
Perfluorooctanoic acid (PFOA)	335-67-1	20	20	11	12	11	11	10	11	11	95
Sulfonic Acids (PFSA)											
Perfluorobutanesulfonic acid (PFBS)	375-73-5	2.7 J	2.8 J	1.6 J	2.2 J	1.6 J	1.7 J	2.0 J	1.8 J	2.2 J	No recommended surface water standard
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.93 J	<0.59	<0.52	<0.62	<0.59	<0.51	<0.55	<0.53	<0.51	"
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	2.0 J	1.7 J	0.93 J	2.7 J	1.6 J	1.1 J	1.6 J	2.1 J	1.4 J	"
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	2.2	2.3	2.0	2.4	2.1	1.8	2.9	2.6	2.0	8

NOTES:

Concentrations are in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).

All samples analyzed for PFAS using Method 537 modified. Only compounds detected in one or more samples are shown on this table.

Recommended non-drinking surface water standards taken from Wisconsin Natural Resources Board Order No. WY-23-19 approved on March 2, 2022

J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL), and the concentration is an approximate value.

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WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 11

SUMMARY OF PFAS DETECTED IN VOC TREATMENT SYSTEM SAMPLES (APRIL 2021 - JUNE 2024)

PFAS Compound by Group	CAS Number	WDHS/WDNR Recommended PFAS Standard (ng/ℓ)		Turbo Stripper				Non-TS	Aeration Reservoir						Absorption	
				Influent		Effluent		Effluent	Effluent						Pond	
		ES	PAL	04/21	12/22	12/22	09/23	4/21	4/21	5/21	9/23	12/23	03/24	06/24	4/21	9/23
PFAS Compounds with Recommended Standards																
Perfluorooctanoic acid (PFOA)	335-67-1	**20**[C1]	*2*[C1]	**2,700**	**2,500**	**2,300**	**1,600**	**120**	**600**	**590**	**320**	**330**	**132**	**25.5 J**	**640**	**350**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1			**1,200 I**	**1,400**	**1,200**	**1,200**	**180**	**290 I**	**260 I**	**250**	**340**	**121**	**103 J**	**310 I**	**280**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	**20**[C2]	*2*[C2]	*2.9*	*1.3 J*	*3.8 J*	*3.7 J*	*1.4 J*	*8.2*	*6.6*	*10*	*4.3 J*	*4.5*	**40.8 J**	*5.4*	*12*
NEtFOSA	4151-50-2			<0.85	<1.3	<1.2	<1.2	<0.81	<0.84	<0.81	<1.1	<2.3	<1.2	<28.8	<0.83	<1.2
NEtFOSAA	2991-50-6			*4.8 J*	*7.8*	*12*	**20**	*4.3 J*	*3.5 J*	*3.7 J*	*6.0*	*6.6 J*	*2.5 J*	**43.5 J**	*2.1 J*	*8.3*
NEtFOSE	1691-99-2			<0.83	<1.2	<1.1	1.8 J	<0.8	<0.82	<0.79	<1.0	<2.1	<1.9	**43.2 J**	<0.81	*1.8 J*
Perfluorononanoic acid (PFNA)	375-95-1	**30**	*3*	*18*	**30**	*26*	*18*	2.7	*5.1*	*4.8*	*3.5 J*	*3.7 J*	<1.7	<13.2	*6.8*	*3.8 J*
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	**40**	*4*	**820**	**560**	**560**	**540**	**94**	**240**	**250**	**130**	**94**	**55.1**	<14.8	**250**	**130**
Perfluorodecanoic acid (PFDA)	335-76-2	**300**	*60*	3.9	8.9	10	4.4 J	1.5 J	1.6 J	1.2 J	<1.2	<2.5	<1.3	<15.8	1.8 J	<1.3
HFPO-DA (GenX)	13252-13-6	**300**	*30*	1.6 J	2.6 J	1.4 J	3.4 J	<1.4	1.6 J	<0.51	<1.1	<2.3	<1.1	<16.0	1.7 J	<1.2
Perfluorododecanoic acid (PFDoA)	307-55-1	**500**	*100*	<0.54	0.86 J	<0.73	<0.69	<0.51	<0.53	<1.4	<0.66	<1.4	<1.0	<27.4	<0.53	<0.70
Perfluorobutanoic acid (PFBA)	375-22-4	**10,000**	*2,000*	*3,000*	*2,300*	*2,500*	1,800	140	1,300	1,500	450	480	318	171	1,300	460
Perfluorohexanoic acid (PFHxA)	307-24-4	**150,000**	*30,000*	4,900	3,000	3,100	2,700	190	1,300	1,500	610	590	288	41.7 J	1,400	620
Perfluorobutanesulfonic acid (PFBS)	375-73-5	**450,000**	*90,000*	1,100	1,100	1,100	1,100	71	340	350	310	210	147	28.6 J	310	320
PFAS Compounds without Recommended Standards																
Perfluoropentanoic acid (PFPeA)	2706-90-3	NRS	NRS	1,900	1,500	1,600	970	180	730	950	290	260	194	31 J	780	310
Perfluoroheptanoic acid (PFHpA)	375-85-9	NRS	NRS	1,600	960	1,000	890	57	330	400	170	190	74.1	<14.9	340	180
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	NRS	NRS	250	230	230	110	11	76	77	25	22	12.5	<16.2	80	26
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NRS	NRS	62 I	76	71	36	5.2	9.4 I	10 I	6.9	5.9 J	4.2	<39.9	12 I	6.7
Perfluorodecanesulfonic acid (PFDS)	335-77-3	NRS	NRS	<0.31	<1.5	<1.4	<1.4	<0.3	<0.31	<0.30	<1.3	<2.7	<1.4	<36.0	0.88 J	<1.4
4:2 FTS	757124-72-4	NRS	NRS	5.2	4.6 J	3.9	3.4 J	0.30 J	1.6 J	1.6 JI	<0.89	<1.9	<1.0	<23.0	1.7 J	<0.95
6:2 FTS	27619-97-2	NRS	NRS	150	190	180	180	56	230	42	24	78	31.5	54.4 J	140	24
8:2 FTS	39108-34-4	NRS	NRS	<9	8.6	8.9	10	1.5 J	1.7 J	<0.43	<1.1	<2.3	<1.1	<50.0	0.47 J	<1.2
NMeFOSA	31506-32-8	NRS	NRS	<0.42	<0.89	<0.84	<0.80	<0.4	2.2	0.59 J	0.95 J	<1.6	1.5 J	544	<0.41	<0.81
NMeFOSAA	2355-31-9	NRS	NRS	1.9 J	2.7 J	2.1 J	3.1 J	1.5 J	7.7	7.5	7.6	3.5 J	4.4	55.2 J	2.3 J	11
NMeFOSE	24448-09-7	NRS	NRS	<1.3	<1.7	<1.6	<1.5	<1.3	<1.4	<1.3	<1.4	<3.0	<1.1	82.2 J	<1.3	<1.5

NOTES:

Concentrations are in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).

All samples analyzed using Method 537 Modified. Only compounds detected in one or more samples are shown in this table.

C1 = The WDNR proposed a ES abd PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed 9/15/23 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.

Detected concentrations at or above a recommended NR 140 PAL are *italicized* ; those at or above a recommended NR 140 ES are **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

I = Value is EMPC (estimated maximum possible concentration).

J = Result is less than the RL but greater than or equal to the MDL, and the concentration is an approximate value.

Non-TS Effluent = Non-Turbo Stripper effluent (eff).

NRS = No recommended standard in Cycle 11.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 12

SUMMARY OF WATER QUALITY PARAMETERS MEASURED IN FIELD AND LABORATORY SAMPLES (APRIL - MAY 2024)

Parameter	Units	Boring/Well ID, Sample Depth (ft bgs), Measurement/Results						
		PF-2	PF-7	PF-11			PF-14	PF-16
		44-48	43-47	25-29	41-45	57-61	50-54	25-29
DO	mg/L	2.97	8.45	9.12	1.54	3.86	0.30	9.2
ORP	mV	30.8	31.3	-73.9	-78.1	-2.7	-111.7	-136.9
Temperature	°C	11.91	12.28	11.22	11.79	9.53	11.34	10.41
Alkalinity	mg/L	74.5	NA	NA	346	NA	NA	200
Dissolved Iron	mg/L	2.7	NA	NA	3.6	NA	NA	0.56
Dissolved Manganese	mg/L	0.31	NA	NA	0.72	NA	NA	0.52
Total Iron	mg/L	40	NA	NA	5.6	NA	NA	1.9
Total Manganese	mg/L	0.80	NA	NA	0.77	NA	NA	0.56
Nitrate	mg/L	3.200	NA	NA	<0.012	NA	NA	0.013 J
Sulfate	mg/L	19.4	NA	NA	<0.76	NA	NA	0.750 J
Total Organic Carbon	mg/L	2.3	NA	NA	11	NA	NA	4.3
Sulfide	mg/L	<1.0	NA	NA	<1.0	NA	NA	<1.0
Ethane	µg/L	<1.5	NA	NA	38	NA	NA	<1.5
Ethene	µg/L	<1.7	NA	NA	86	NA	NA	<1.7
Methane	µg/L	<2.0	NA	NA	260	NA	NA	<2.0
Total PFAS Concentration	ng/L	**25**	**182**	**7,327**	**10,392**	**418**	**182**	**1,677**
Total VOC Concentration	µg/L	**0**	**0**	**255**	**2,561**	**8.7**	**119**	**3,488**

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TABLE 12

SUMMARY OF WATER QUALITY PARAMETERS MEASURED IN FIELD AND LABORATORY SAMPLES (APRIL - MAY 2024)

Parameter	Units	Boring/Well ID, Sample Depth (ft bgs), Measurement/Results						
		PF-16			PF-19	PF-24		PF-25
		40-44	50-54	65-69	44-48	20-24	30-34	15-19
DO	mg/L	9.42	8.72	2.74	5.90	2.07	4.40	9.78
ORP	mV	-45.9	-10.6	-111.8	29.5	67.3	52.3	-94.7
Temperature	°C	10.68	10.18	8.37	12.21	11.49	12.67	9.93
Alkalinity	mg/L	NA	NA	NA	NA	NA	57.8	NA
Dissolved Iron	mg/L	NA	NA	NA	NA	NA	4.0	NA
Dissolved Manganese	mg/L	NA	NA	NA	NA	NA	0.074	NA
Total Iron	mg/L	NA	NA	NA	NA	NA	2.4	NA
Total Manganese	mg/L	NA	NA	NA	NA	NA	0.062	NA
Nitrate	mg/L	NA	NA	NA	NA	NA	13	NA
Sulfate	mg/L	NA	NA	NA	NA	NA	11.4	NA
Total Organic Carbon	mg/L	NA	NA	NA	NA	NA	1.2	NA
Sulfide	mg/L	NA	NA	NA	NA	NA	<1.0	NA
Ethane	µg/L	NA	NA	NA	NA	NA	<1.5	NA
Ethene	µg/L	NA	NA	NA	NA	NA	<1.7	NA
Methane	µg/L	NA	NA	NA	NA	NA	<2.0	NA
Total PFAS Concentration	ng/L	**19,863**	**1,336**	**169**	**42**	**2,667**	**375**	**2,178**
Total VOC Concentration	µg/L	**20,764**	**348**	**6.3**	**0**	**0.6**	**1.6**	**29.2**

GANNETT FLEMING

TABLE 12

SUMMARY OF WATER QUALITY PARAMETERS MEASURED IN FIELD AND LABORATORY SAMPLES (APRIL - MAY 2024)

Parameter	Units	Boring/Well ID, Sample Depth (ft bgs), Measurement/Results						
		PF-25			PF-26			
		26-30	40-44	52-56	13-17	22-26	40-44	55-59
DO	mg/L	0.88	1.42	2.93	NA	NA	NA	NA
ORP	mV	-115.6	-81.0	18.6	NA	NA	NA	NA
Temperature	°C	11.54	11.79	10.44	NA	NA	NA	NA
Alkalinity	mg/L	NA	NA	101	NA	207	NA	NA
Dissolved Iron	mg/L	NA	NA	2.1	NA	1.7	NA	NA
Dissolved Manganese	mg/L	NA	NA	0.22	NA	2.2	NA	NA
Total Iron	mg/L	NA	NA	28	NA	2.6	NA	NA
Total Manganese	mg/L	NA	NA	0.4	NA	2.2	NA	NA
Nitrate	mg/L	NA	NA	9.1	NA	<0.012	NA	NA
Sulfate	mg/L	NA	NA	14.9	NA	23.0	NA	NA
Total Organic Carbon	mg/L	NA	NA	1.9 J	NA	1.7	NA	NA
Sulfide	mg/L	NA	NA	<1.0	NA	<1.0	NA	NA
Ethane	µg/L	NA	NA	<1.5	NA	<1.5	NA	NA
Ethene	µg/L	NA	NA	<1.7	NA	<1.7	NA	NA
Methane	µg/L	NA	NA	<2.0	NA	24	NA	NA
Total PFAS Concentration	ng/L	**5,565**	**5,408**	**989**	**2,600**	**3,713**	**5,158**	**697**
Total VOC Concentration	µg/L	**1,446**	**129**	**24.2**	**69.4**	**60.4**	**56.9**	**253**

GANNETT FLEMING

TABLE 12

SUMMARY OF WATER QUALITY PARAMETERS MEASURED IN FIELD AND LABORATORY SAMPLES (APRIL - MAY 2024)

Parameter	Units	Boring/Well ID, Sample or Screened Depths (ft bgs), Measurement/Results						
		PF-27				SVE-4	SVE-5	SVE-6
		11-15	22-26	52-56	64-68	3.5-18.5	3.5-18.5	4-19
DO	mg/L	0.54	9.21	5.39	7.07	1.41	0.00	1.21
ORP	mV	-79.9	-56.9	-3.0	-17.5	69.6	76.1	58.6
Temperature	°C	8.45	11.47	15.12	14.92	12.66	11.89	11.07
Alkalinity	mg/L	NA	273	NA	172	341 H	54.2	146
Dissolved Iron	mg/L	NA	5.7	NA	29	0.58	62	83
Dissolved Manganese	mg/L	NA	1.3	NA	0.34	0.049	4.9	1.9
Total Iron	mg/L	NA	130	NA	55	NA	NA	NA
Total Manganese	mg/L	NA	8.1	NA	0.72	NA	NA	NA
Nitrate	mg/L	NA	0.037	NA	0.022	3.1	1.7	<0.060
Sulfate	mg/L	NA	33.9	NA	<0.76	77.0	81.2	1.0
Total Organic Carbon	mg/L	NA	4.9	NA	4.5	69	23	430
Sulfide	mg/L	NA	<10	NA	<2.1	NA	NA	NA
Ethane	µg/L	NA	<1.5	NA	<1.5	<1.5	<1.5	13
Ethene	µg/L	NA	<1.7	NA	12	<1.7	<1.7	1.8 J
Methane	µg/L	NA	140	NA	36	9.8	570	1,700
Total PFAS Concentration	ng/L	**2,744**	**5,498**	**3,414**	**2,310**	**46,424**	**5,019**	**299**
Total VOC Concentration	µg/L	**130**	**68.2**	**13,730**	**2,155**	**5,552**	**1,003**	**2,347**

GANNETT FLEMING

TABLE 12

SUMMARY OF WATER QUALITY PARAMETERS MEASURED IN FIELD AND LABORATORY SAMPLES (APRIL - MAY 2024)

Parameter	Units	Boring/Well ID, Sample or Screened Depths (ft bgs), Measurement/Results						
		SVE-7	**W-5**	**W-7A**	**W-32**	**W-33**	**W-34**	**W-35**
		4-19	**3-13**	**27.5-32.5**	**5-17**	**5-17**	**7-22**	**11-21**
DO	mg/L	0.41	4.77	1.23	1.25	0.00	0.10	0.02
ORP	mV	69.8	62.4	21.9	42.6	24.7	66.1	38.8
Temperature	°C	11.41	15.99	12.27	12.74	12.64	12.15	11.88
Alkalinity	mg/L	351	N/A	40.2	102	57.1	231	199 H
Dissolved Iron	mg/L	3.1	<0.47	<0.047	320	94	82	0.44
Dissolved Manganese	mg/L	0.15	<0.0017	0.0020 J	36	4.4	7.1	0.38
Total Iron	mg/L	NA	0.54	<0.047	NA	NA	NA	NA
Total Manganese	mg/L	NA	0.0049 J	0.0020 J	NA	NA	NA	NA
Nitrate	mg/L	0.018 J	<0.62	21	1.000	0.20	0.026	0.026
Sulfate	mg/L	9.08 J	2.23	19.3	8.88 J	35.2	6.34 J	16.3
Total Organic Carbon	mg/L	83	6.6	1.8	700	22	85	31
Sulfide	mg/L	NA	<0.46	<0.42	NA	NA	NA	NA
Ethane	µg/L	<1.5	<1.5	<1.5	69	15	<1.5	14
Ethene	µg/L	25	<1.7	<1.7	1.8 J	<1.7	310	17
Methane	µg/L	81	<2.0	<2.0	2,400	1,000	1,800	2,900
Total PFAS Concentration	ng/L	**43,446**	**1,622**	**3,547**	**1,997**	**5,850**	**42,073**	**3,365**
Total VOC Concentration	µg/L	**70,582**	**0**	**46**	**3,692**	**1,446**	**7,337**	**3,316**

NOTES:

All water quality parameter (WQP) field measurements & lab results from April or May 2024 unless otherwise noted below.
Total PFAS concentration for SVE-4 through SVE-7 were from samples collected in 08/23.
Samples were analyzed in the field for dissolved oxygen (DO), oxidation reduction potential (ORP), and temperature using a Hanna 98494 or 98194 Multiparameter Water Quality Meter
Samples were analyzed in by ALS for Ethane, Ethene, and Methane using method RSK-175; for Iron and Manganese using method SW6020B; for Alkalinity using method A2320 B-11; for Chloride and Sulfate using method SW9056A; for Nitrate using method E353.2 R2.0; for Sulfide using SW9034; and for Total Organic Carbon SW9060A.
Sample depths are in feet below ground surface (ft bgs). NA- Not analyzed. mg/L - milligrams per liter.
µg/L - micrograms per liter, ng/L - nanograms per liter, mV - millivolts, and °C - degrees Celsius.

GANNETT FLEMING

WRR ENVIRONMENTAL SERVICES CO., INC.
EAU CLAIRE, WISCONSIN

TABLE 13

PROPOSED SURFACE WATER & GROUNDWATER MONITORING SCHEDULE FOR PFAS

Sample Point Name	WDNR Well ID	Sampling Frequency
Production Well	010	A
Drinking Water Well	020	A
W-1	100	A
W-1A	103	A
W-1D	109	A
W-2	112	A
W-2A	115	B
W-2B	118	B
W-3	121	A
W-3A	124	B
W-3B	127	B
W-4	130	A
W-5	133	A
W-6	136	A
W-7	139	A
W-7A	142	A
W-17	169	A
W-17A	172	A
W-17B	175	A
W-18	178	A
W-18A	181	A
W-19R	185	A
W-26	205	A
W-27	208	A
W-28	211	A
W-29	214	A
W-30A	217	A
W-30B	220	A
W-31A	223	A
W-31B	226	A
W-32	228	A
W-33	233	A
W-34	235	A
W-35	Not applicable	A
MW-104	318	A
MW-104A	321	A
MW-106	330	B
MW-106A	333	B

Sample Point Name	WDNR Well ID	Sampling Frequency
MW-111	357	A
MW-111A	360	A
MW-111B	363	B
MW-112	366	A
MW-112A	369	A
MW-112B	372	A
MW-113	375	B
MW-113A	378	B
MW-113B	381	B
MW-114	384	A
MW-114A	387	A
MW-114B	390	B
MW-115	393	A
MW-115A	396	A
MW-115B	399	B
MW-116	402	A
TW-1	404	A
RW-2	503	A
RW-4	509	A
RW-5	512	A
RW-6	515	A
RW-10	527	A
RW-11	530	A
RW-12	532	A
RW-13	534	A
SVE-4	Not applicable	A
SVE-5	"	A
SVE-6	"	A
SVE-7	"	A
SW-1	"	A
SW-4	"	A
SW-6	"	A
Seep 2N (2nd Seep N)	610	A
Method Blank	995	1 per event
Field Blank	997	1 per event
Trip Blank	999	1 per cooler
Duplicate	Not applicable	1 per 10 samples

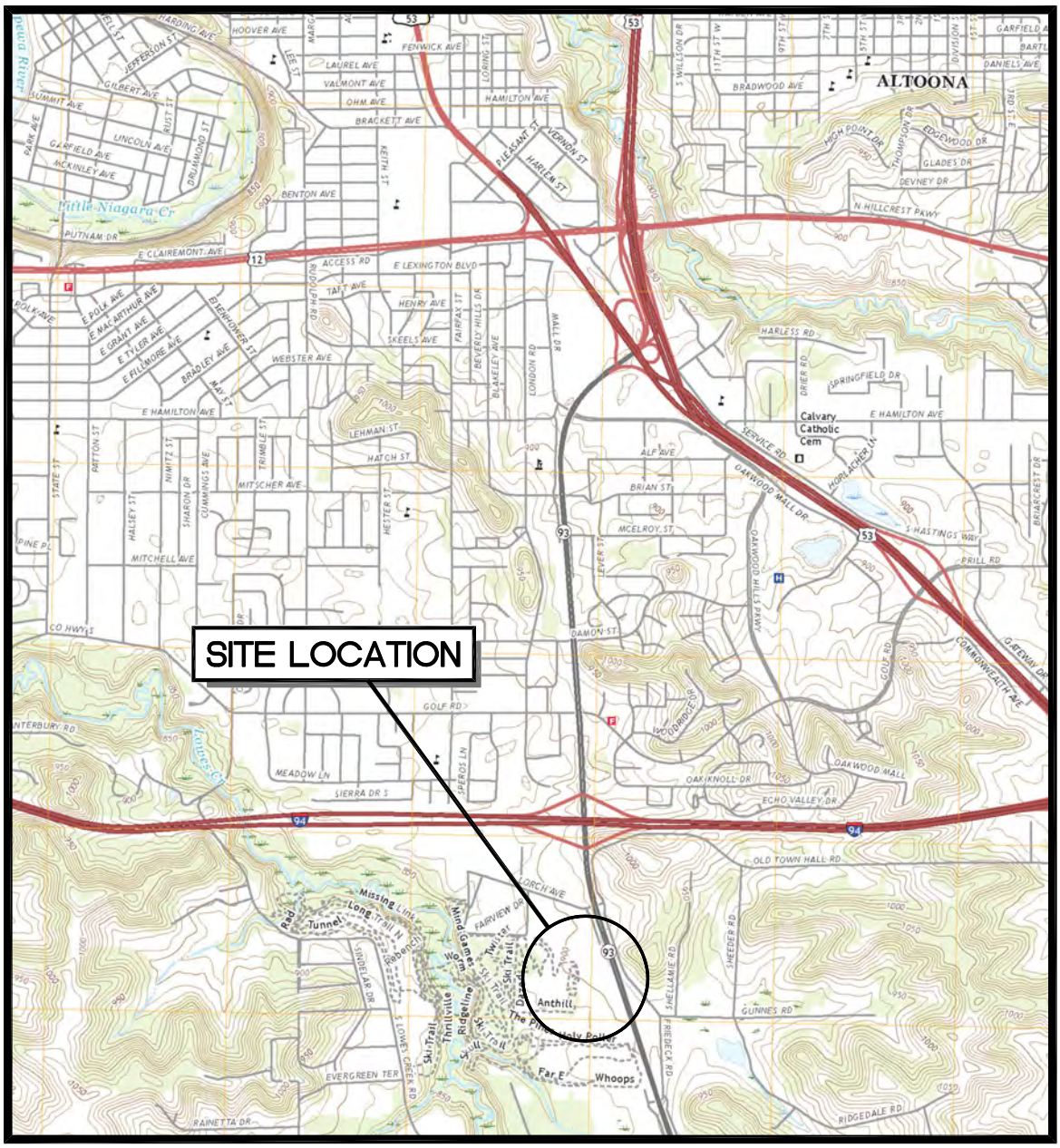
NOTES:

A = Annual sample collected in the spring each year.

B = Bienniel sample collected in the spring every even-numbered year.

GANNETT FLEMING

FIGURE 1



SCALE: 1:24,000

7.5 MIN TOPOGRAPHIC MAP
EAU CLAIRE EAST, WISCONSIN
2018

LOCATION MAP

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

071524
2024_55929-007_awm_PINV_F01

GANNETT FLEMING

FIGURE 2

APPROX. SCALE: 1 INCH = 330 FEET

GOOGLE EARTH IMAGERY (08/21)

N

AERIAL PHOTO OF SITE

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

071524
2024_55929-007_awm_PINV_F02

GANNETT FLEMING

FIGURE 3

NORTHWEST ENTERPRISES, INC.

SCALE

0 80

Approximate Scale In Feet

LEGEND

- PRIMARY AFFF APPLICATION AREA (2007/2010)
- PRIMARY ROUTES OF AFFF/WATER RUNOFF ON SITE (2007/2010)
- COMPOSITE ASPHALT SAMPLE AREA (08/23 – DRAWN TO SCALE)
- PFAS GRAB SAMPLE LOCATION
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DUAL PHASE WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- 1-INCH-DIAMETER MONITORING POINT
- PFAS GEOPROBE LOCATION (12/22), (12/23), & (04/24)
- AIR SPARGE WELL
- ABOVEGROUND STORAGE TANK (APPROXIMATE LOCATION)
- FENCE
- SURFACE WATER DRAINAGE DITCH

DISCRETE/COMPOSITE SAMPLE SCHEMATIC

AS-3-1 AS-3-2 AS-3-4 AS-3-3 ASP-3 10' 10'

ASP-1 ASP-2 ASP-3 ASP-4 ASP-5 ASP-6 ASP-7 ASP-8 ASP-9

SVE-6 SVE-7 SVE-4 SVE-5

W-2,A,B W-3,A,B W-4 W-5 W-6 W-7,A W-8 (SVE WELL) W-10 W-11 W-12 W-13 W-14 W-15 W-16 W-17 W-18 W-19R W-20 W-21 W-22 W-23 W-24 W-25 W-26 W-27 W-28 W-31A,B W-32 W-33 W-34 W-35 W-1A W-1B (AI WELL)

PW-1 MP-1 TW-1

RW-2 RW-4 RW-5 RW-6 RW-8 RW-9 RW-10 RW-11 RW-12 RW-13

PF-1 PF-2 PF-3 PF-4 PF-5 PF-6 PF-7 PF-8 PF-9 PF-10 PF-11 PF-12 PF-13 PF-14 PF-15 PF-16 PF-17 PF-18 PF-19 PF-20 PF-21 PF-22 PF-23 PF-24 PF-25 PF-26 PF-27

AS-1 AS-6 AS-7 AS-8 AS-9 AS-10

DW-1

OFFICE

E-I BUILDING

NORTHERN AI/SVE SYSTEM

E-II BLDG.

BULK LOADING AND UNLOADING AREA CANOPY

E-II WAREHOUSE

CC-7 BLDG.

FUELS BLDG.

DUMPSTER SHELTER

DRUM AND TOTE STORAGE SHEDS (1-17)

STATE HIGHWAY "93"

BUILDING A

MIDDLE AI/SVE SYSTEM

360,000-GAL. RESERVOIR

TS EFF.

NON-TS EFF.

AERATION RES. EFF.

TURBO-STRIPPER INF.

TURBO STRIPPER BLDG.

SOUTHERN AI/SVE SYSTEM

SVE WELL

RESCO BUILDING

ABSORPTION POND

ABSORP. POND

OVERHEAD POWER LINES

892 894 896 898 900 902 904 906 908

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. THE LOCATIONS OF STORAGE TANKS ARE APPROXIMATE.

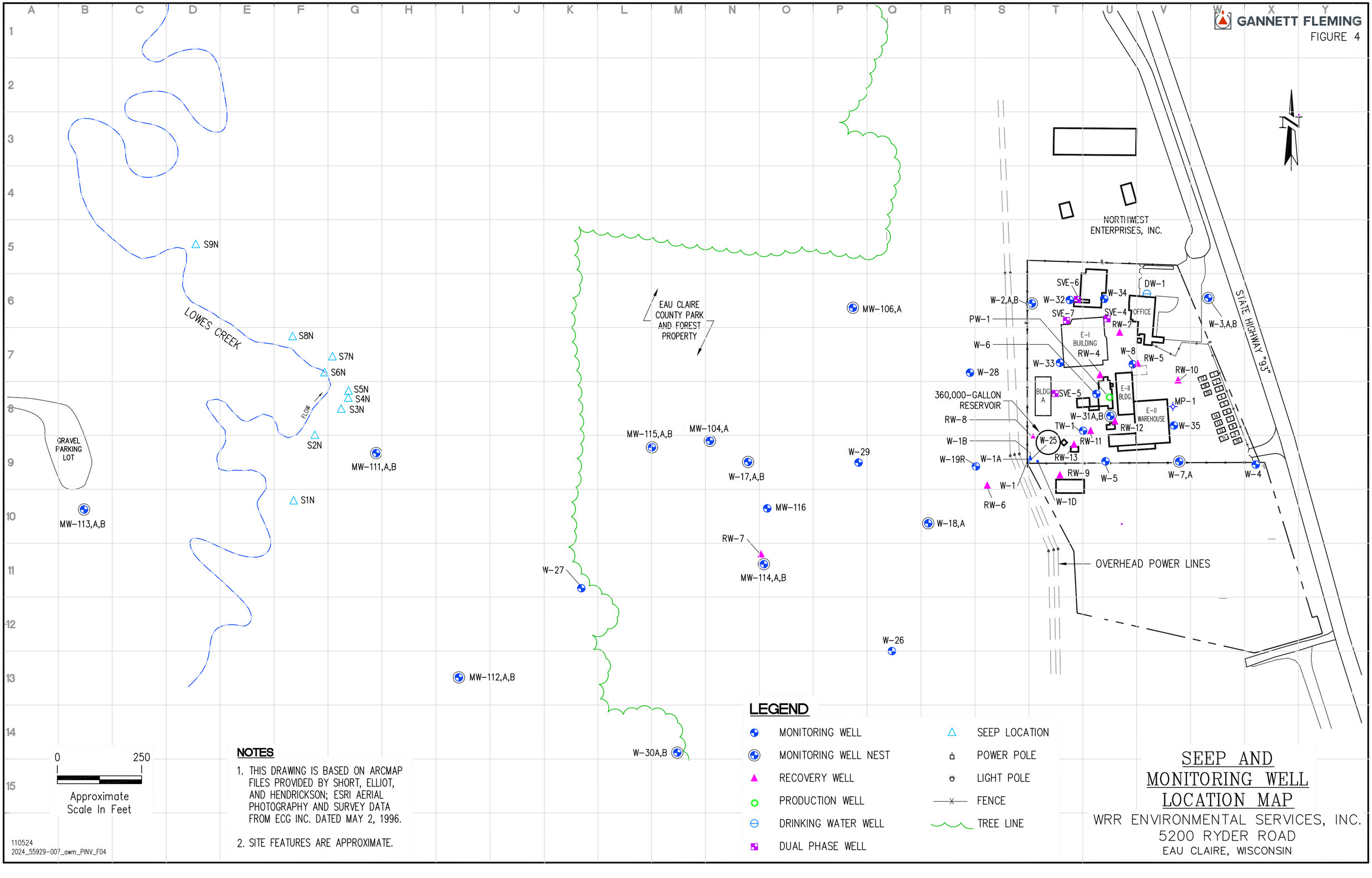
SITE PLAN SHOWING PFAS SAMPLE LOCATIONS

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

010325
2024_55929-007_awm_PINV_F03

GANNETT FLEMING

FIGURE 4



0 250

Approximate Scale In Feet

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.

LEGEND

- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- DUAL PHASE WELL
- SEEP LOCATION
- POWER POLE
- LIGHT POLE
- FENCE
- TREE LINE

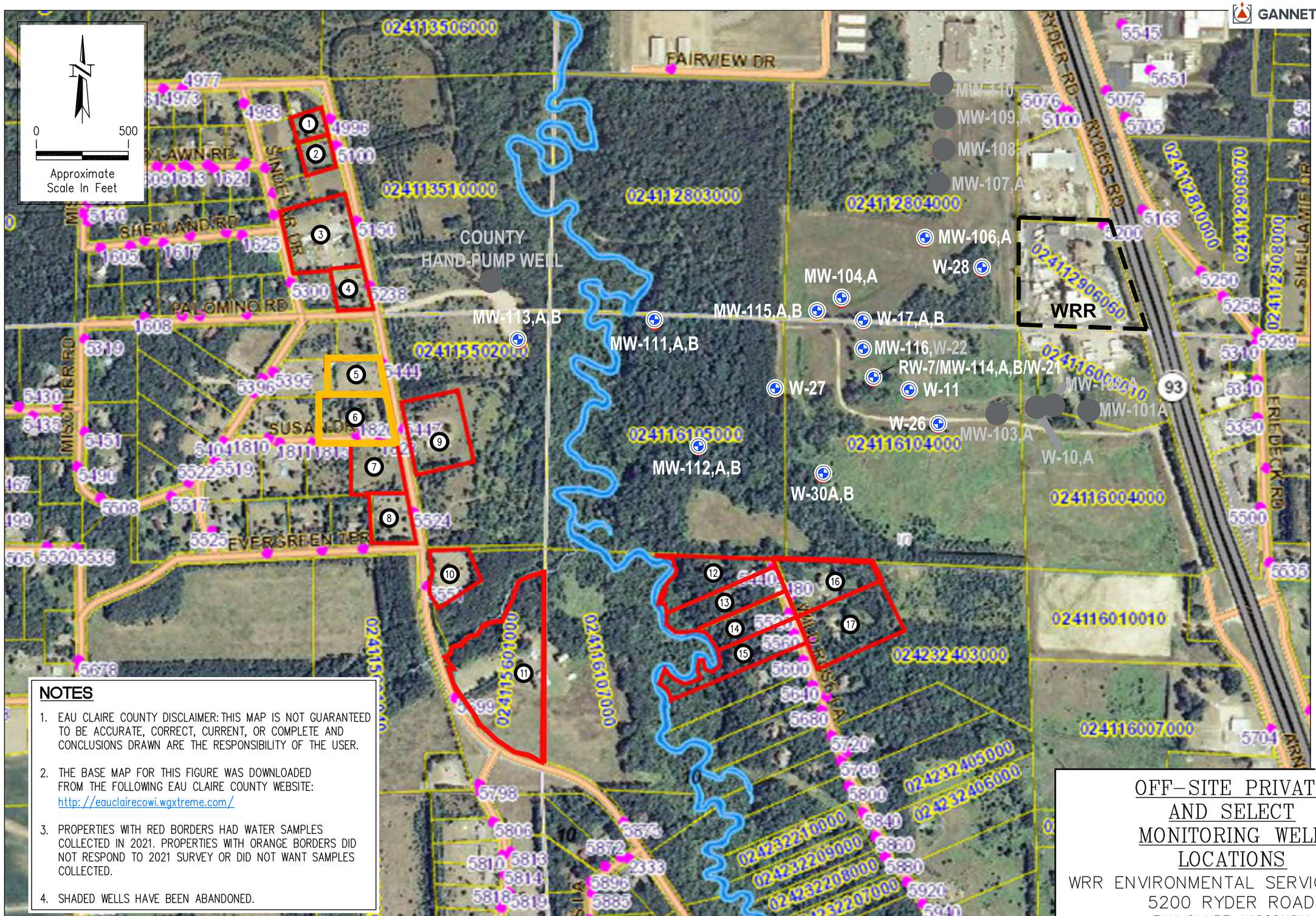
SEEP AND MONITORING WELL LOCATION MAP

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

110524
2024_55929-007_awm_PINV_F04

GANNETT FLEMING

FIGURE 5



NOTES

1. EAU CLAIRE COUNTY DISCLAIMER: THIS MAP IS NOT GUARANTEED TO BE ACCURATE, CORRECT, CURRENT, OR COMPLETE AND CONCLUSIONS DRAWN ARE THE RESPONSIBILITY OF THE USER.
2. THE BASE MAP FOR THIS FIGURE WAS DOWNLOADED FROM THE FOLLOWING EAU CLAIRE COUNTY WEBSITE: http://eauclairecowi.wgxtreme.com/
3. PROPERTIES WITH RED BORDERS HAD WATER SAMPLES COLLECTED IN 2021. PROPERTIES WITH ORANGE BORDERS DID NOT RESPOND TO 2021 SURVEY OR DID NOT WANT SAMPLES COLLECTED.
4. SHADED WELLS HAVE BEEN ABANDONED.

OFF-SITE PRIVATE AND SELECT MONITORING WELL LOCATIONS

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

101024
2024_55929-007_awn_PINV_F05

GANNETT FLEMING

FIGURE 6

APPROX. SCALE: 1 INCH ~ 2,000 FEET

Google Earth 04/17

N

LEGEND

△ SW-1 SURFACE WATER SAMPLE LOCATION

SURFACE WATER SAMPLE LOCATIONS

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

101024
2024_55929-007_awm_PINV_F06

GANNETT FLEMING

FIGURE 7

0 80

Approximate Scale In Feet

NORTHWEST ENTERPRISES, INC.

SCALE

STATE HIGHWAY "93"

OFFICE

E-I BUILDING

NORTHERN AI/SVE SYSTEM

E-II BLDG.

E-II WAREHOUSE

FUELS BLDG.

CC-7 BLDG.

BUILDING A

MIDDLE AI/SVE SYSTEM

SOUTHERN AI/SVE SYSTEM

360,000-GAL. RESERVOIR

TURBO STRIPPER BLDG.

BULK LOADING AND UNLOADING AREA CANOPY

DRUM AND TOTE STORAGE SHEDS (1-17)

DUMPSTER SHELTER

RESCO BUILDING

ABSORPTION POND

OVERHEAD POWER LINES

W-1 (891.03)
W-1A
W-1B (AI WELL)
W-1D
W-2,A,B (886.21)
W-3,A,B (886.46)
W-4 (885.96)
W-5 (889.04)
W-6 (886.73)
W-7,A (885.50)
W-8 (SVE WELL) (NM)
W-19* W-19R
W-25
W-28 (886.88)
W-31A,B
W-32 (885.23)
W-33 (885.61)
W-34 (884.98)
W-35 (885.60)
PW-1
MP-1 (NM)
TW-1
SVE WELL
SVE-4
SVE-5
SVE-6
SVE-7
RW-1*
RW-2 (885.99)
RW-4
RW-5 (NM)
RW-6
RW-8
RW-9
RW-10
RW-11
RW-12
RW-13
PF-1
PF-2
PF-3
PF-4
PF-5
PF-6
PF-7
PF-8
PF-9
PF-10
PF-11
PF-12
PF-13
PF-14
PF-15
PF-16
PF-17
PF-19
PF-20
PF-21
PF-22
PF-23
PF-24
PF-25
PF-26
PF-27
(885.00)
(884.00)
(884.00)
(886.00)
(886.00)
(887.00)
(888.00)
(889.00)
(890.00)
(891.00)

LEGEND

- GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (889.62) GROUNDWATER ELEVATION (FT MSL)
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- 1-INCH-DIAMETER MONITORING POINT
- PFAS GEOPROBE LOCATION (12/22), (12/23), & (04/24)
- DUAL PHASE WELL
- ABOVEGROUND STORAGE TANK (APPROXIMATE LOCATION)
- POWER POLE
- LIGHT POLE
- FENCE
- SURFACE WATER DRAINAGE DITCH

SHALLOW ON-SITE AQUIFER GROUNDWATER SURFACE CONTOUR MAP WITH RECOVERY WELLS OPERATING (MAY 2024)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

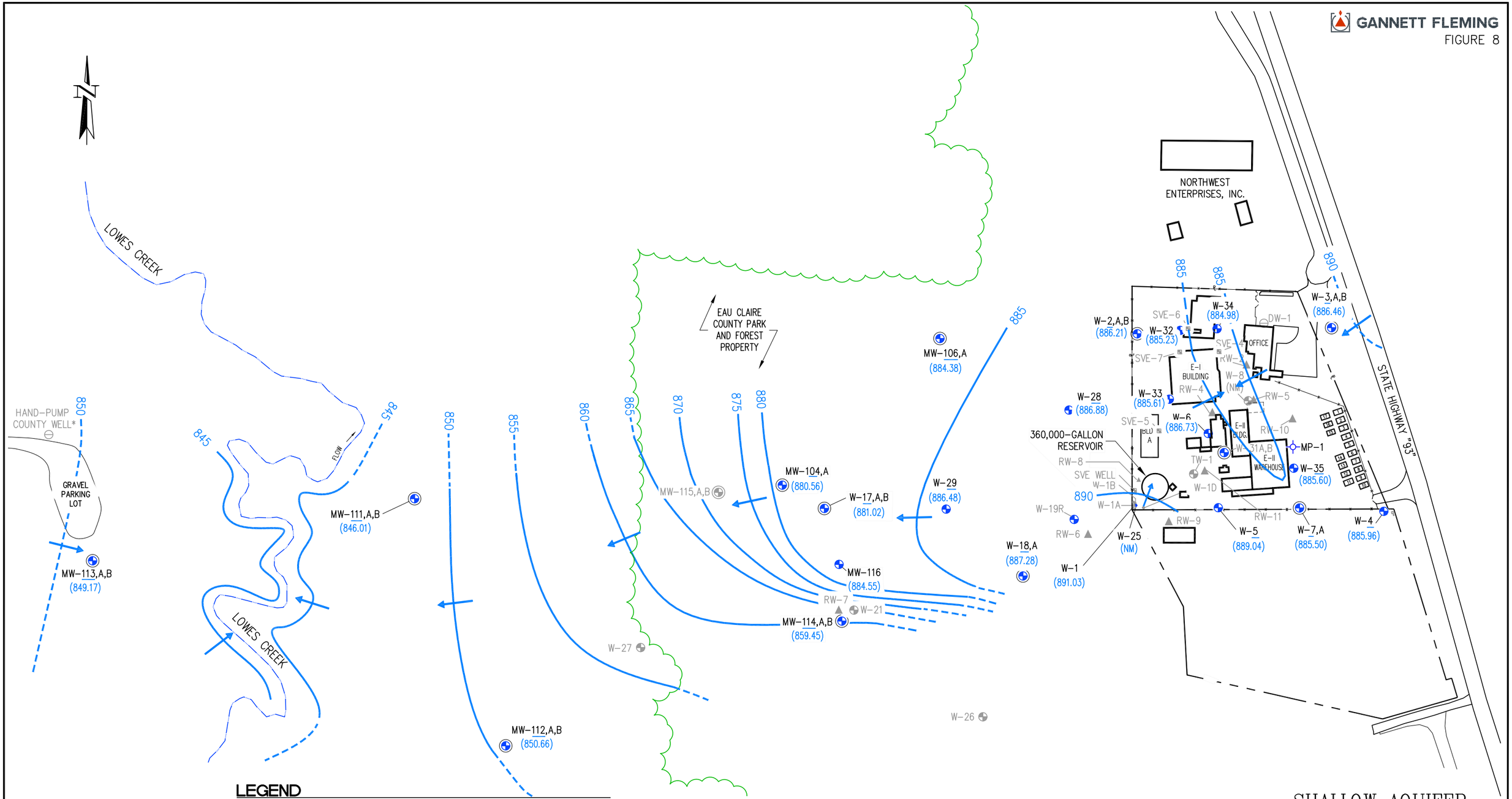
NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. THE LOCATIONS OF STORAGE TANKS ARE APPROXIMATE
4. GROUNDWATER ELEVATIONS MEASURED IN MAY 2024 WITH WELL RW-6 & WRR'S PRODUCTION WELL OPERATING.

111424
GW Elevations & Contours Checked by AK on 08/20/24
2024_55929-007_awm_PINV_F07

GANNETT FLEMING

FIGURE 8



LEGEND

- 870 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- (888.91) GROUNDWATER ELEVATION (FT MSL)
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DRINKING WATER WELL
- DUAL PHASE WELL
- FENCE

0 250

Approximate Scale In Feet

111424

GW Elevations & Contours Checked by AK on 08/20/24

2024_55929-007_awm_PINV_F08

NOTES

1. GROUNDWATER CONTOURS ARE BASED ON ELEVATIONS MEASURED FROM MAY 24 THROUGH 29, 2024, WITH RECOVERY WELL RW-6 AND WRR'S PRODUCTION WELL (PW-1) OPERATING.
2. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
3. SITE FEATURES ARE APPROXIMATE.
4. GROUNDWATER ELEVATIONS FROM SHADED WELLS WERE NOT USED TO CONSTRUCT GROUNDWATER CONTOURS.

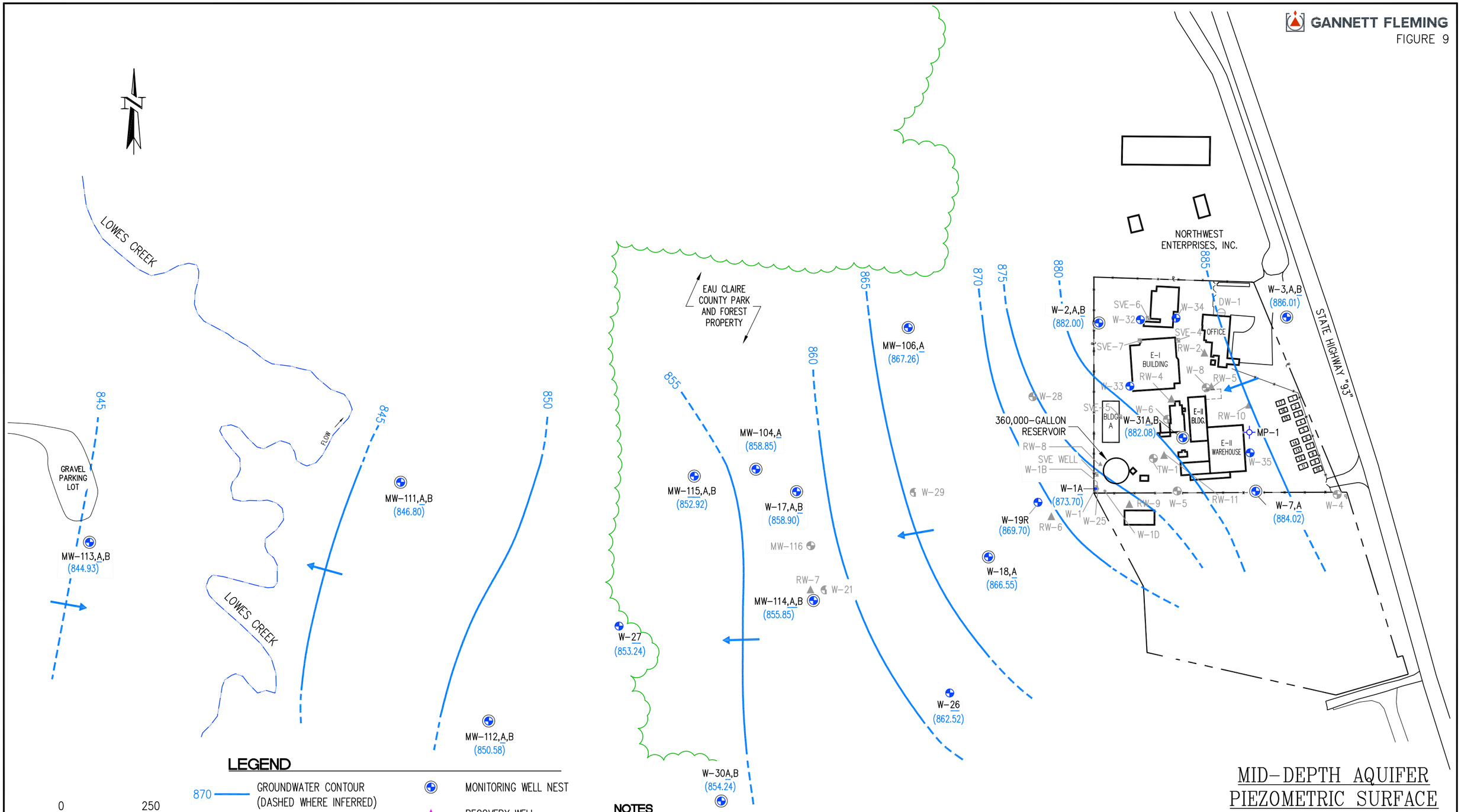
SHALLOW AQUIFER GROUNDWATER SURFACE CONTOUR MAP (MAY 2024)

WRR ENVIRONMENTAL SERVICES, INC.

EAU CLAIRE, WISCONSIN

GANNETT FLEMING

FIGURE 9



LEGEND

- 870 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- (888.91) GROUNDWATER ELEVATION (FT MSL)
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DRINKING WATER WELL
- DUAL PHASE WELL
- FENCE

0 250

Approximate Scale In Feet

NOTES

1. GROUNDWATER CONTOURS ARE BASED ON ELEVATIONS MEASURED FROM MAY 24 THROUGH MAY 29, 2024, WITH RECOVERY WELL RW-6 AND WRR'S PRODUCTION WELL (PW-1) OPERATING.
2. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
3. SITE FEATURES ARE APPROXIMATE.
4. GROUNDWATER ELEVATIONS FROM SHADED WELLS WERE NOT USED TO CONSTRUCT GROUNDWATER CONTOURS.

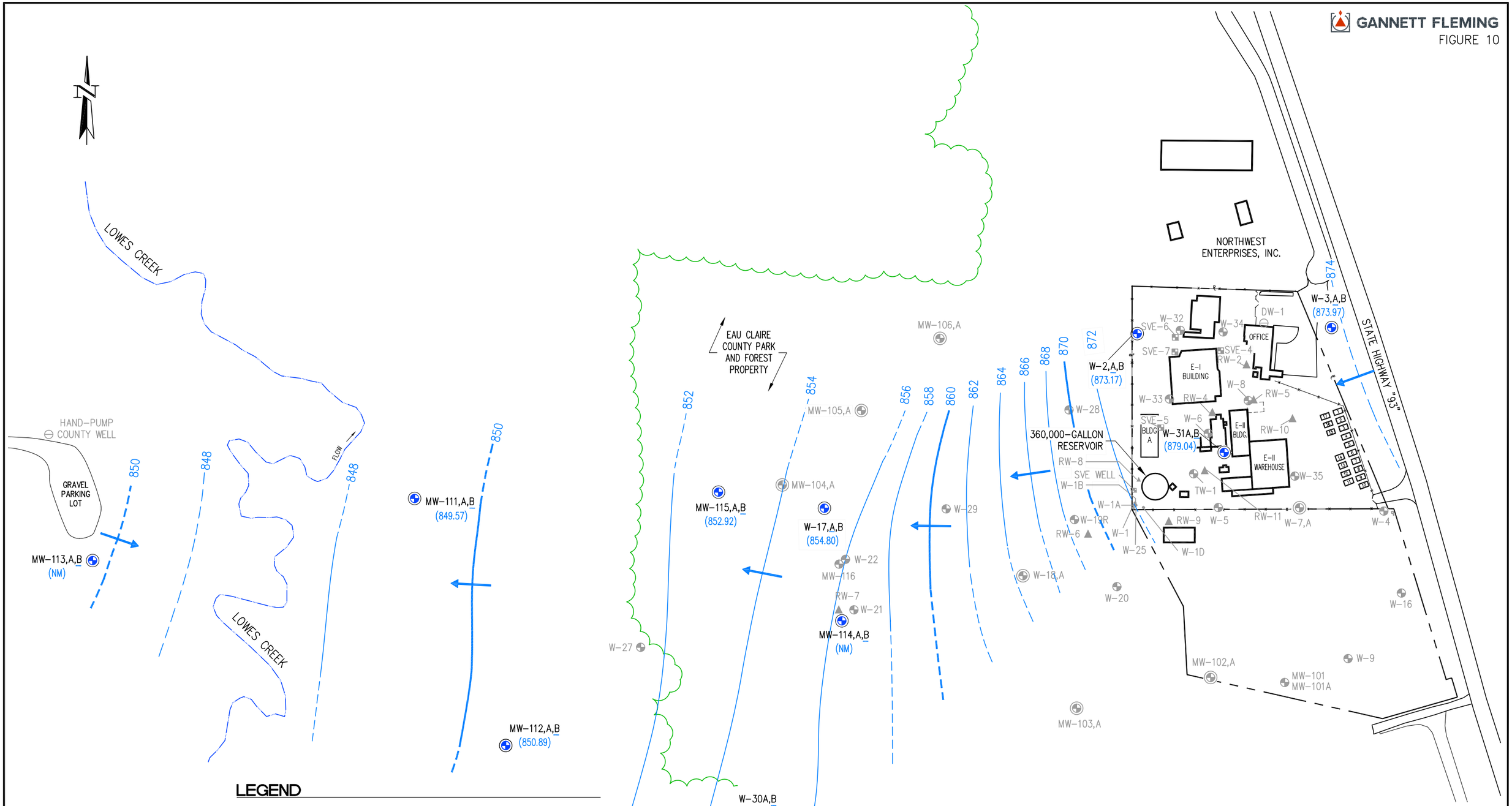
MID-DEPTH AQUIFER PIEZOMETRIC SURFACE CONTOUR MAP (MAY 2024)

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

111424
GW Elevations & Contours Checked by JSD on 08/19/24
202407_55929-007_awm_PINV_F09

GANNETT FLEMING

FIGURE 10



LEGEND

0 250

Approximate Scale In Feet

870 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

GROUNDWATER FLOW DIRECTION

(888.91) GROUNDWATER ELEVATION (FT MSL)

MONITORING WELL

MONITORING WELL NEST

RECOVERY WELL

DRINKING WATER WELL

DUAL PHASE WELL

FENCE

111424
GW Elevations and Contours Checked by AK on 08/21/24
2024_55929-007_awm_PINV_F10

NOTES

1. GROUNDWATER CONTOURS ARE BASED ON ELEVATIONS MEASURED FROM MAY 24 THROUGH 29, 2024, WITH RECOVERY WELL RW-6 AND WRR'S PRODUCTION WELL (PW-1) OPERATING.
2. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
3. SITE FEATURES ARE APPROXIMATE.
4. SHADED WELLS WERE NOT USED TO CREATE THIS MAP.
5. ELEVATION FOR W-31B WAS NOT USED TO CONSTRUCT THE CONTOUR LINES SHOWN ON THIS FIGURE.

DEEP/BEDROCK AQUIFER PIEZOMETRIC CONTOUR MAP (MAY 2024)

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

GANNETT FLEMING

FIGURE 11

LEGEND

- GEOPROBE BORING LOCATION (12/22)
- GEOPROBE BORING LOCATION (12/23 AND 4/24)
- COMPOSITE ASPHALT SAMPLE LOCATION (8/23)
- MONITORING WELL
- RECOVERY WELL
- PRODUCTION WELL
- AIR SPARGE WELL

0 20

Approximate Scale In Feet

NOTES:

THE GOOGLE AERIAL IMAGERY USED TO CREATE THIS MAP IS DATED 06/14/2021.

BORING AND WELL LOCATIONS ARE APPROXIMATE.

RW-3 WAS ABANDONED IN NOV. 2020.

BULK LOADING PFAS INVESTIGATION AREA

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

GANNETT FLEMING

FIGURE 12

0 80

Approximate Scale In Feet

ESTIMATED EXTENT OF TOTAL PFAS CONCENTRATIONS AT OR GREATER THAN 1 µg/kg

ESTIMATED EXTENT OF TOTAL PFAS CONCENTRATIONS AT OR GREATER THAN 10 µg/kg

ESTIMATED EXTENT OF TOTAL PFAS CONCENTRATIONS AT OR GREATER THAN 100 µg/kg

NORTHWEST ENTERPRISES, INC.

SCALE

STATE HIGHWAY "93"

ASP-1 ND

SVE-6

W-32

W-34

W-2,A,B

PF-17 0.5–5.0' –34 5.0–10' –8.6

SVE-7

SVE-4

ASP-4 0.52

RW-2

ASP-2 ND

PF-18 0.5–5.0' –18 5.0–10' –12

E-I BUILDING

NORTHERN AI/SVE SYSTEM

PF-16 0.5–5.0' –6.5 5.0–7.5' –3.1

W-33

PF-15 0.5–5.0' –6.7 5.0–10' –4.5

ASP-3 ND

RW-4

PF-5 1–4' –9.2 12–16' –13

PF-7 1–4' –46 12–16' –17

AS-8

AS-10

AS-6

AS-9

PF-6 1–4' –115 4–6' –220 6–8' –315 8–12' –170 12–16' –154

W-28

SVE-5

BUILDING A

PF-9 0.5–5.0' –33 5.0–7.5' –12

W-6

PW-1

AS-1

E-II BLDG.

MIDDLE AI/SVE SYSTEM

W-31A,B

PF-11 0.5–2.5' –40 0.5–5.0' –3.6

PF-12 0.5–5.0' –6.3 5.0–7.5' –4.7

PF-10 0.5–5.0' –11 5.0–7.5' –1.3

TW-1

RW-11

RW-12

CC-7 BLDG.

PF-14 0.5–5.0' –21 5.0–10' –14

FUELS BLDG.

RW-8

360,000-GAL. RESERVOIR

RW-13

PF-13 0.5–2.5' –23 0.5–5.0' –7.1

TURBO STRIPPER BLDG.

SOUTHERN AI/SVE SYSTEM

SVE WELL

W-1B (AI WELL)

W-25

W-1A

W-1

PF-27 0.5–2.5' –10

W-1D

PF-26 0.5–2.5' –8.9

PF-25 0.5–2.5' –1.1 0.5–5.0' –1.4

W-5

DUMPSTER SHELTER

PF-24 0.5–5.0' –9.3 5.0–10' –10

W-19R

RW-6

RW-9

RESCO BUILDING

OVERHEAD POWER LINES

DW-1

OFFICE

W-3,A,B

PF-4 1–4' –264 4–6' –82 6–8' –165 8–10' –12 10–12' –5.8 12–16' –27

PF-3 1–4' –24 4–6' –284 6–8' –354 8–10' –79 10–12' –23 12–16' –62

PF-2 1–4' –15 4–8' –6.0 8–12' –4.0 12–16' –0.59 16–20' –84

PF-19 0.5–5.0' –9.6 5.0–10' –7.4

RW-5

W-8 (SVE WELL)

AS-7

ASP-5 0.43

PF-20 0.5–2.5' –4.4 0.5–5.0' –1.9 5.0–7.5' –0.80

PF-1 1–4' –36 12–16' –23

ASP-6 0.27

PF-8 1–4' –44 12–16' –15

ASP-7 ND

RW-10

BULK LOADING AND UNLOADING AREA CANOPY

MP-1

PF-21 0.5–2.5' –4.7 0.5–5.0' –1.5 5.0–10' –10

DRUM AND TOTE STORAGE SHEDS (1–17)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

PF-22 0.5–5.0' –16 5.0–10' –11

W-35

ASP-8 0.41

PF-23 0.5–5.0' –23 5.0–10' –6.8

ASP-9 ND

W-7,A

W-4

LEGEND

- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DUAL PHASE WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- 1–INCH–DIAMETER MONITORING POINT
- GEOPROBE LOCATION (12/22 – 4/24)
- AIR SPARGE WELL
- ABOVEGROUND STORAGE TANK (APPROXIMATE LOCATION)
- COMPOSITE ASPHALT SAMPLE AREA (08/23 – DRAWN TO SCALE)
  PFAS CONCENTRATION IN MICROGRAMS PER KILOGRAM (µg/kg)
- FENCE
- SURFACE WATER DRAINAGE DITCH
- PF–23 0.5–5.0' –23 5.0–10' –6.8 — BORING ID, SAMPLE DEPTH IN FEET, AND PFAS CONCENTRATION IN MICROGRAMS PER KILOGRAM (µg/kg)

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. THE LOCATIONS OF STORAGE TANKS ARE APPROXIMATE.
4. ESTIMATED EXTENT OF TOTAL PFAS CONCENTRATIONS BASED ON ASPHALT AND SOIL SAMPLES COLLECTED FROM DECEMBER 2022 THROUGH DECEMBER 2023.

TOTAL PFAS CONCENTRATIONS IN ASPHALT AND SOIL ON SITE (DEC. 2022–DECEMBER 2023)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

111424
Checked by AWM on 11/13/24
2024_55929-007_awm_PINV_F12

GANNETT FLEMING

FIGURE 13

NORTHWEST ENTERPRISES, INC.

0 80

Approximate Scale In Feet

SCALE

STATE HIGHWAY "93"

OFFICE

E-I BUILDING

NORTHERN AI/SVE SYSTEM

BUILDING A

E-II BLDG.

BULK LOADING AND UNLOADING AREA CANOPY

DRUM AND TOTE STORAGE SHEDS (1-17)

MIDDLE AI/SVE SYSTEM

CC-7 BLDG.

E-II WAREHOUSE

FUELS BLDG.

360,000-GAL. RESERVOIR

TURBO STRIPPER BLDG.

SOUTHERN AI/SVE SYSTEM

SVE WELL

W-1B (AI WELL)

DUMPSTER SHELTER

RESCO BUILDING

OVERHEAD POWER LINES

W-2,A,B	1,090
SVE-6	299
W-32	6,099
W-34	42,073
SVE-7	43,446
PF-17	11,109
SVE-4	14,593
W-3,A,B	39
RW-2	149,474
PF-18*	NS
PF-19	28,073
RW-5	41,793
PF-16	1,477
W-33	5,850
W-8 (SVE WELL)	
AS-7	46,784
PF-3	89,652
AS-8	26,164
PF-2	138,516
PF-20	1,363
AS-9	38,730
AS-10	
PF-1	21,948
PF-15	9,122
RW-4	14,853
PF-8	44,981
AS-6	30,524
RW-10	4,400
W-28	1,834
SVE-5	5,019
W-6	6,992
PW-1	
AS-1	7,211
PF-21	2,540
PF-9	7,804
MP-1	4,996
W-31A,B	
PF-22	6,334
PF-11	7,095
PF-12	4,534
PF-10	4,859
RW-12	
W-35	3,365
TW-1	5,835
RW-11	4,160
PF-23	8,649
PF-14	5,804
RW-8	
PF-13	4,671
RW-13	
W-7,A	5,070
W-25	
W-1A	
PF-25*	NS
W-1	766
PF-27*	NS
W-1D	
PF-26	2,669
W-5	1,622
PF-24	1,818
W-4	456
W-19R	
RW-9	
RW-6	

LEGEND

- 2,723 — TOTAL PFAS CONCENTRATION AT SAMPLE LOCATION IN NANOGRAMS PER LITER (ng/l)
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE TWO ORDERS OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE ONE ORDER OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE THE RECOMMENDED NR 140 ES
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DUAL PHASE WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- 1-INCH-DIAMETER MONITORING POINT
- GEOPROBE LOCATION (12/22 – 4/24)
- AIR SPARGE WELL
- ABOVEGROUND STORAGE TANK (APPROXIMATE LOCATION)
- FENCE
- SURFACE WATER DRAINAGE DITCH

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. THE LOCATIONS OF STORAGE TANKS ARE APPROXIMATE.
4. ESTIMATED EXTENT OF TOTAL PFAS CONCENTRATIONS BASED ON GROUNDWATER SAMPLES COLLECTED FROM DECEMBER 2022 THROUGH JUNE 2024, WITH THE MOST RECENT DATA SHOWN. EXTENT LINES ARE DASHED WHERE INFERRED.
5. SEE FIGURE 14 FOR TABLE SUMMARIZING PFAS EXCEEDANCES.

*. SHALLOW GROUNDWATER SAMPLES WERE NOT COLLECTED FROM BORINGS PF-18, PF-25, AND PF-27 DUE TO PROXIMITY OF NEARBY WELLS RW-2, W-5, AND W-1 RESPECTIVELY.

ESTIMATED EXTENT OF PFAS IN ON-SITE SHALLOW AQUIFER (DEC. 2022-JUNE 2024)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

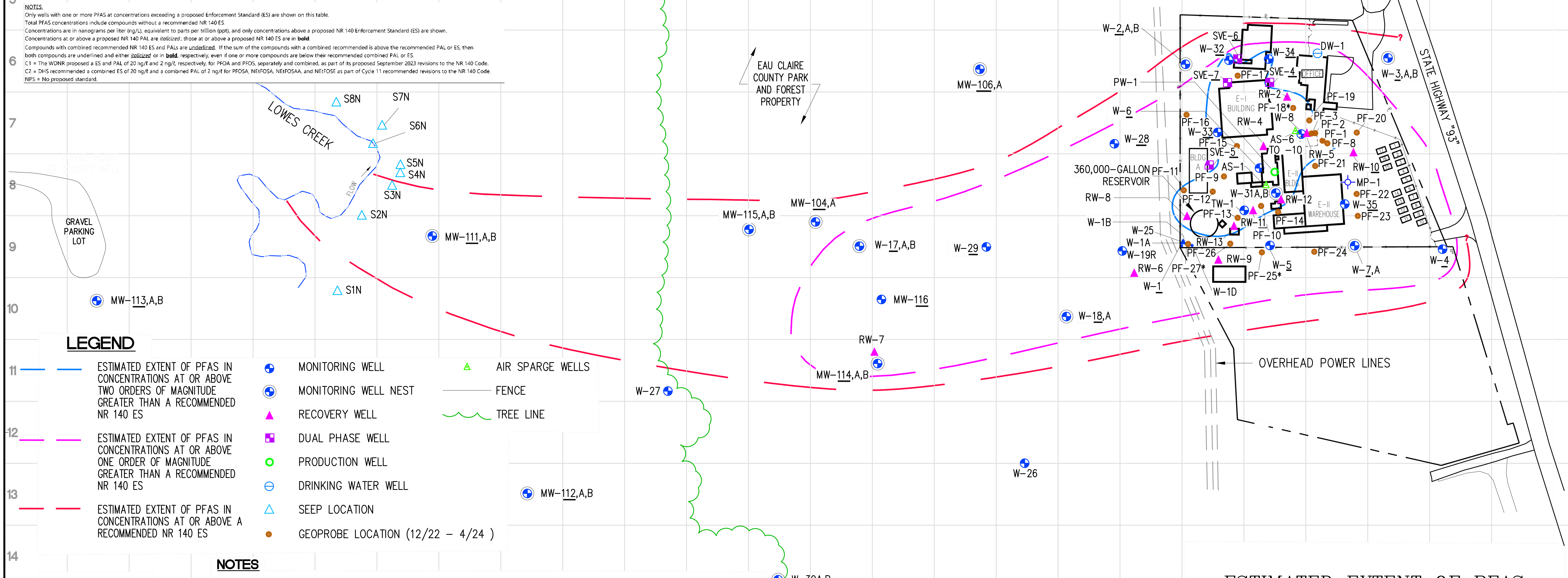
111424
Checked by AWM on 11/05/24
2024_55929-007_awm_PINV_F13

EXTENT OF PFAS IN SHALLOW AQUIFER

Sample ID & Boring Depth in ft bgs, if applicable	AS-1	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-17	W-18	W-28	W-29	W-32	W-33	W-34	W-35	MP-1	MW-104	MW-111	MW-114	MW-116	PF-1 (18-20)	PF-2 (17-21)	PF-3 (16-20)	PF-8 (18-22)	PF-9 (8-12)	PF-10 (7-11)	PF-11 (7-11)	PF-12 (9-13)	PF-13 (2-6)	PF-14 (14-18)	WI DHS Proposed PFAS Standard (ng/ℓ) NR 140 ES	NR 140 PAL
Sample Date	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/23	5/24	5/24	5/24	5/24	12/22	12/22	12/22	12/22	12/23	12/23	12/23	12/23	12/23	12/23		
Perfluorooctanoic acid (PFOA)	440	47	54	5.3	53	240	630	340	220	440	190	170	3,300	650	1,500	390	440	44	28	280	14	9,300	16,000	7,500	32,000	830	540	840	580	180	930	20^{C1}	2^{C1}
Perfluorooctanesulfonic acid (PFOS)	2,900	240	77	15	190	130	2,200	110	490	560	460	320	150	1,200	450		4.1	74		60	30	8,200	71,000	12,000	1,500	1,600	1,900	3,200	850	510	870		
Perfluorooctanesulfonamide (PFOSA)	400	78					28			32				81								93	9.10 J	1,400	11	44	96.0	32	45	530	49	20^{C2}	2^{C2}
NEtFOSA	57																					22		40	10					240 J	5.2 J		
NEtFOSAA	490	3.6 J					35							46								55	190	2,100	120	15	76	34	16	470	14		
NEtFOSE	1.4 J																					18			7.2 J					1,900	21		
Perfluorononanoic acid (PFNA)	35					45														33		100	420	98	140							30	3
Perfluorohexanesulfonic acid (PFHxS)	520						1,900	110	68	170	210	41	76	190		79	63			170		450	3,200	1,800	3,400	450	160	250	130	67 J	260	40	4
Perfluorobutanoic acid (PFBA)																							13,000	23,000								10,000	2,000
Total PFAS Concentrations	7,211	766	1,090	39	456	1,622	6,992	5,070	1,442	3,156	1,834	922	6,099	5,850	42,073	3,365	4,996	235	59	4,193	150	21,948	138,516	89,652	44,981	7,804	4,859	7,095	4,534	4,671	5,804	NPS	NPS

Sample ID & Boring Depth in ft bgs, if applicable	PF-15 (13-17)	PF-16 (9-13)	PF-17 (13-17)	PF-19 (17-21)	PF-20 (17-20)	PF-21 (17-21)	PF-22 (16-20)	PF-23 (16-20)	PF-24 (13-17)	PF-26 (5-10)	PF-26 (13-17)	PF-27 (11-15)	AS-6	AS-7	AS-8	AS-9	RW-2	RW-4	RW-5	RW-10	RW-11	SVE-4	SVE-5	SVE-6	SVE-7	TW-1	WI DHS Proposed PFAS Standard (ng/ℓ) NR 140 ES	NR 140 PAL
Sample Date	12/23	12/23	12/23	12/23	12/23	12/23	12/23	12/23	12/23	12/23	4/24	4/24	12/22	12/22	12/22	12/22	5/23	5/23	5/23	6/24	6/24	8/23	8/23	8/23	8/23	5/24		
Perfluorooctanoic acid (PFOA)	780	170	2,300	8,400	50	960	980	910	230	350	370	390	3,400	8,700	2,700	6,200	15,000	1,700	1,000	1,100	390	150	490	69	360	490	20^{C1}	2^{C1}
Perfluorooctanesulfonic acid (PFOS)	1,500	400	2,600	16	560	2.1		4.2	750	230	300	270	15,000	15,000	16,000	17,000	3,800	3,400	12,000	130	1,400	190	870	51	240	2,500		
Perfluorooctanesulfonamide (PFOSA)	81	26 J								26				7.0					980	1.7 J	100	320	78		16	110	20^{C2}	2^{C2}
NEtFOSA														11					180	3.1 J		14			8.4	1.9 J		
NEtFOSAA	44													610					15,000	110	110	5.2	130		31	130		
NEtFOSE																			170	19					1.6 J	2		
Perfluorononanoic acid (PFNA)													99	110	84	140	75	30	42							38	30	3
Perfluorohexanesulfonic acid (PFHxS)	510	66 J	89	280			84	64	58	110	93	110	4,200	6,500	2,400	6,000	7,000	2,100	2,600	73	280		270			440	40	4
Perfluorobutanoic acid (PFBA)																	31,000		1,900								10,000	2,000
Total PFAS Concentrations	9,122	1,477	11,109	28,073	1,363	2,540	6,334	8,649	1,818	2,669	2,600	2,774	30,524	46,784	26,164	38,725	149,474	14,853	41,793	4,400	4,160	14,593	5,019	299	43,446	5,835	NPS	NPS

NOTES:
Only wells with one or more PFAS at concentrations exceeding a proposed Enforcement Standard (ES) are shown on this table.
Total PFAS concentrations include compounds without a recommended NR 140 ES.
Concentrations are in nanograms per liter (ng/L), equivalent to parts per trillion (ppt), and only concentrations above a proposed NR 140 Enforcement Standard (ES) are shown.
Concentrations at or above a proposed NR 140 PAL are *italicized*; those at or above a proposed NR 140 ES are in **bold**.
Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.
C1 = The WDNR proposed a ES and PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.
C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.
NPS = No proposed standard.



LEGEND

- ESTIMATED EXTENT OF PFAS IN CONCENTRATIONS AT OR ABOVE TWO ORDERS OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF PFAS IN CONCENTRATIONS AT OR ABOVE ONE ORDER OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- DUAL PHASE WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- SEEP LOCATION
- GEOPROBE LOCATION (12/22 – 4/24)
- AIR SPARGE WELLS
- FENCE
- TREE LINE

0 250
Approximate Scale In Feet

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. ESTIMATED EXTENT OF PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES IS BASED ON SAMPLES COLLECTED FROM BORINGS AND UNDERLINED WELLS IN DECEMBER 2022 THROUGH JUNE 2024 UNLESS OTHERWISE NOTED, WITH THE MOST RECENT DATA SHOWN. EXTENT LINES ARE DASHED WHERE INFERRED.

*. SHALLOW GROUNDWATER SAMPLES WERE NOT COLLECTED FROM BORINGS PF-18, PF-25, AND PF-27 DUE TO THE PROXIMITY OF NEARBY WELLS RW-2, W-5, AND W-1 RESPECTIVELY.

TABLE AND FIGURE CHECKED BY AWM ON 11/05/24
112524
2024_55929-007_awm_PINV_F14

ESTIMATED EXTENT OF PFAS IN SHALLOW AQUIFER (DECEMBER 2022 THROUGH JUNE 2024)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

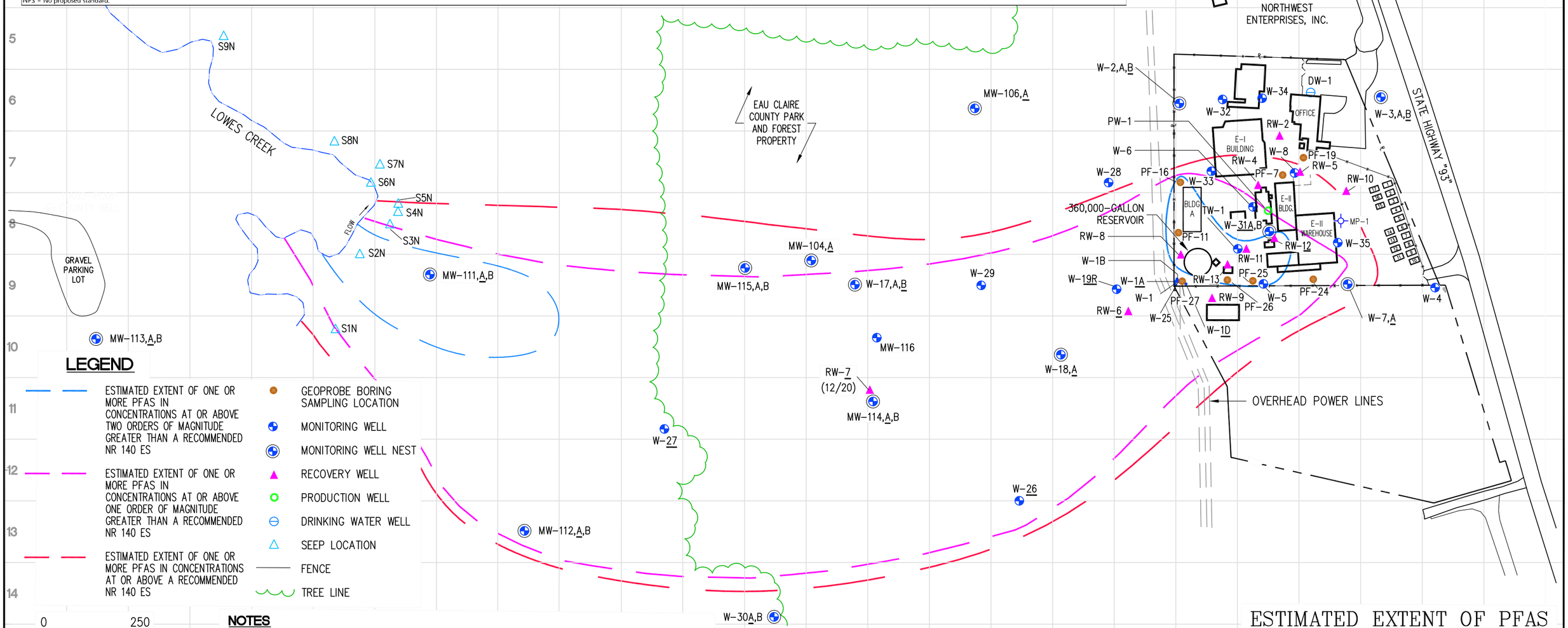
GANNETT FLEMING

FIGURE 15

EXTENT OF PFAS IN THE MID-DEPTH AQUIFER

Sample ID & Boring Depth in ft bgs, if applicable	W-1A	W-1D	W-17B	W-18A	W-19R	W-26	W-27	W-31A	MW-104A	MW-111A	MW-112A	MW-114A	PF-7 (43-47)	PF-11 (25-29)	PF-11 (41-45)	PF-16 (25-29)	PF-16 (40-44)	PF-24 (20-24)	PF-24 (30-34)	PF-25 (15-19)	PF-25 (26-30)	PF-25 (40-44)	PF-26 (22-26)	PF-26 (40-44)	PF-27 (22-26)	RW-6	RW-12	RW-13	WI DHS Proposed PFAS Standard (ng/l)	
Sample Date	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	5/23	5/23	5/23	NR 140 ES	NR 140 PAL
Perfluorooctanoic acid (PFOA)	970	1,200	650	760	400	210	1,700	450	93	5,900	180	37	20	1,100	1,500	300	5,900	400	19	270	910	2,300	540	1,200	740	1,200	4,400	1,300	20[C1]	2[C1]
Perfluorooctanesulfonic acid (PFOS)	1,300	540	89	330	210			160	9.6		24	28	46	2,000	2,700	710	860	700	210	310	1,200	340	340	840	850	950	4,100	830		
Perfluorooctanesulfonamide (PFOSA)	83	24																		38						0.77 J	9.1		20[C2]	2[C2]
NEtFOSAA																				4.9 J						33	35			
Perfluorononanoic acid (PFNA)																								37		30	51		30	3
Perfluorohexanesulfonic acid (PFHxS)	290	220	230	350	200		240	200			73			250	520	56	630 J	430		87	240	130	160	120	230	480	1,000	360	40	4
Total	7,050	6,630	4,007	5,855	2,157	3,901	3,992	1,741	1,183	7,232	923	307	182	7,327	10,392	1,677	19,863	2,667	375	2,178	5,565	5,408	3,714	5,158	5,498	7,893	24,332	6,730	NPS	NPS

NOTES:
Only wells with one or more PFAS at concentrations exceeding a proposed Enforcement Standard (ES) are shown on this table.
Total PFAS concentrations include compounds without a recommended NR 140 ES.
Concentrations are in nanograms per liter (ng/L), equivalent to parts per trillion (ppb), and only concentrations above a proposed NR 140 Enfocesment Standard (ES) are shown.
Concentrations at or above a proposed NR 140 ES are in **bold**.
Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.
C1 = The WDNR proposed a ES and PAL of 20 ng/l and 2 ng/l, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.
C2 = DHS recommended a combined ES of 20 ng/l and a combined PAL of 2 ng/l for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.
NPS = No proposed standard.



LEGEND

- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE TWO ORDERS OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE ONE ORDER OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES
- GEOPROBE BORING SAMPLING LOCATION
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- SEEP LOCATION
- FENCE
- TREE LINE

0 250

Approximate Scale In Feet

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES IS BASED ON SAMPLES COLLECTED FROM BORINGS AND UNDERLINED WELLS IN MAY 2023 THROUGH MAY 2024 UNLESS OTHERWISE NOTED, WITH THE MOST RECENT DATA SHOWN. EXTENT LINES ARE DASHED WHERE INFERRED.

TABLE AND FIGURE CHECKED BY AWM ON 11/05/24
112524
2024_55929-007_awm_PINV_F15

ESTIMATED EXTENT OF PFAS IN MID-DEPTH AQUIFER (MAY 2023 – MAY 2024)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

GANNETT FLEMING

FIGURE 16

EXTENT OF PFAS IN THE DEEP/BEDROCK AQUIFER

Sample ID & Boring Depth in ft bgs, if applicable	PW-1	W-7A	W-17A	W-31B	MW-112B	MW-115	MW-115A	PF-11 (57-61)	PF-14 (50-54)	PF-16 (50-54)	PF-16 (65-69)	PF-25 (52-56)	PF-26 (55-59)	PF-27 (52-56)	PF-27 (64-68)	WI DHS Proposed PFAS Standard (ng/ℓ)	
Sample Date	06/24	5/24	5/24	5/24	5/24	5/24	5/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	NR 140 ES	NR 140 PAL
Perfluorooctanoic acid (PFOA)	7.6	820	12,000	7.0	140	4,600	360	39	15	410	26	400	260	800	710	20[C1]	*2*[C1]
Perfluorooctanesulfonic acid (PFOS)	47	89	3.5	58		0.91 J	5.7	64	86	180	3.0	240	42	1,700	280		
Perfluorohexanesulfonic acid (PFHxS)			60		57					43		110	210	180	220	40	*4*
Total	**97**	**1,910**	**17,099**	**106**	**1,192**	**9,378**	**3,161**	**418**	**182**	**1,336**	**169**	**989**	**697**	**3,414**	**2,310**	NPS	NPS

NOTES:

Only wells with one or more PFAS at concentrations exceeding a proposed Enforcement Standard (ES) are shown on this table.

Total PFAS concentrations include compounds without a recommended NR 140 ES.

Concentrations are in nanograms per liter (ng/L), equivalent to parts per trillion (ppt), and only concentrations above a proposed NR 140 Enforcement Standard (ES) are shown.

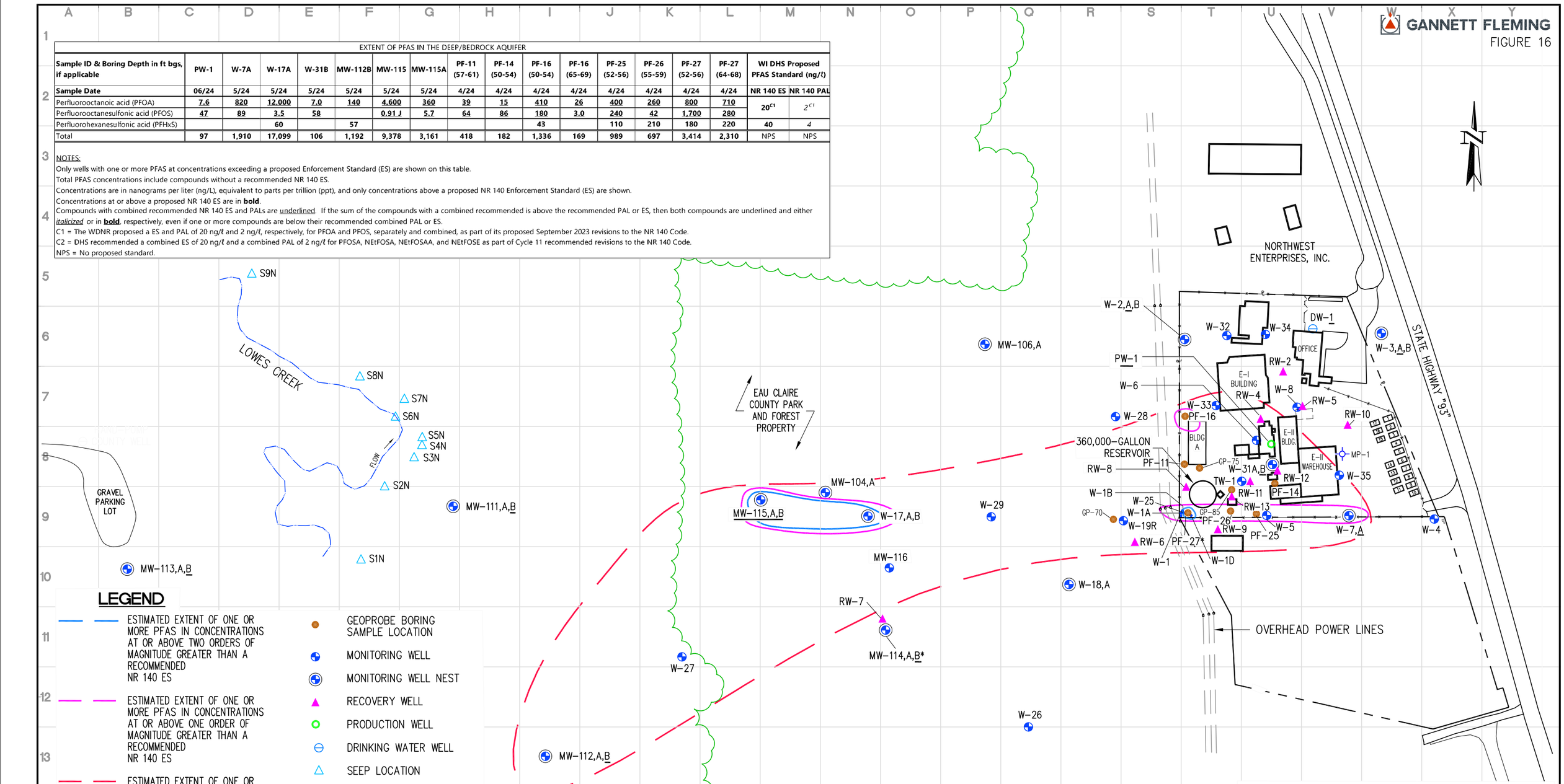
Concentrations at or above a proposed NR 140 ES are in **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

C1 = The WDNR proposed a ES and PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.

NPS = No proposed standard.



LEGEND

- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE TWO ORDERS OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE ONE ORDER OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES
- GEOPROBE BORING SAMPLE LOCATION
- MONITORING WELL
- MONITORING WELL NEST
- RECOVERY WELL
- PRODUCTION WELL
- DRINKING WATER WELL
- SEEP LOCATION
- FENCE
- TREE LINE

0 250

Approximate Scale In Feet

NOTES

1. THIS DRAWING IS BASED ON ARCMAP FILES PROVIDED BY SHORT, ELLIOT, AND HENDRICKSON; ESRI AERIAL PHOTOGRAPHY AND SURVEY DATA FROM ECG INC. DATED MAY 2, 1996.
2. SITE FEATURES ARE APPROXIMATE.
3. ESTIMATED EXTENT OF ONE OR MORE PFAS IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES IS BASED ON SAMPLES COLLECTED FROM BORINGS AND UNDERLINED WELLS IN APRIL 2024 THROUGH JUNE 2024. EXTENT LINES ARE DASHED WHERE INFERRED.

*. MW-114B WAS LAST SAMPLED IN OCTOBER 2021.

TABLE AND FIGURE CHECKED BY AWM ON 11/05/24
111424
2024_55929-007_awm_PINV_F16

ESTIMATED EXTENT OF PFAS IN DEEP/BEDROCK AQUIFER (APRIL 2024 – JUNE 2024)

WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

APPROX. SCALE: 1 INCH ~ 1,750 FEET

Google Earth 07/20

PROPOSED SURFACE WATER SAMPLE LOCATIONS

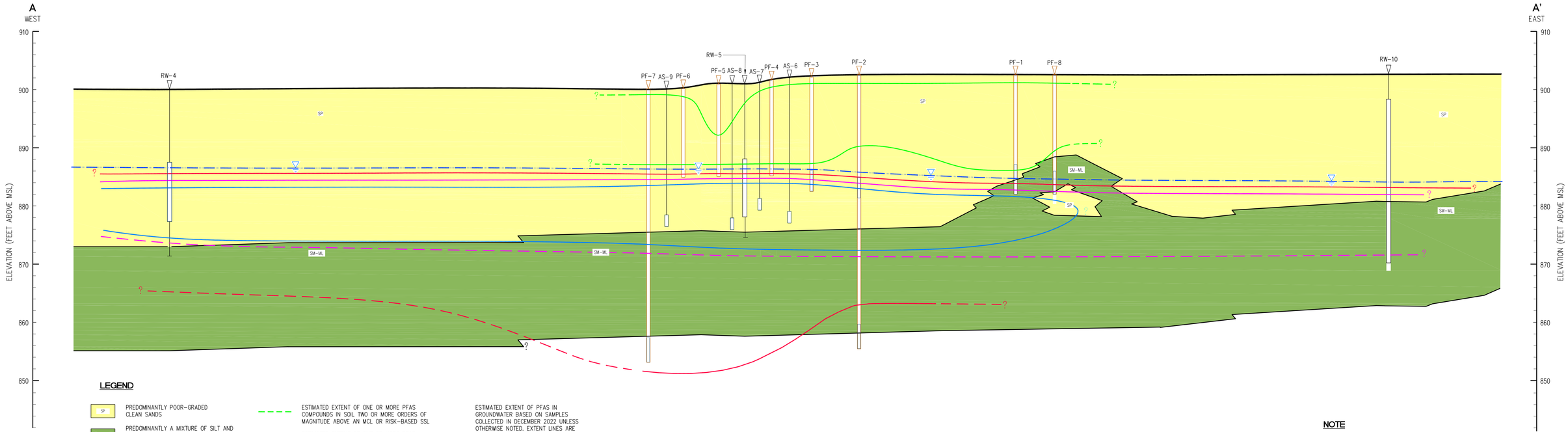
WRR ENVIRONMENTAL SERVICES, INC.
5200 RYDER ROAD
EAU CLAIRE, WISCONSIN

△ SW-1 SURFACE WATER SAMPLE LOCATION

△ PROPOSED LOCATION OF SW-6

SW-4 △ PROPOSED SURFACE WATER SAMPLING LOCATION

112224
2024_55929-007_awm_PINV_F17



LEGEND

- SP — PREDOMINANTLY POOR-GRADED CLEAN SANDS
- SM-ML — PREDOMINANTLY A MIXTURE OF SILT AND VERY FINE SANDS, OFTEN LAMINATED, WITH VARYING AMOUNTS OF CLAY
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- WATER TABLE
- ESTIMATED EXTENT OF ONE OR MORE PFAS COMPOUNDS IN SOIL TWO OR MORE ORDERS OF MAGNITUDE ABOVE AN MCL OR RISK-BASED SSL
- ESTIMATED EXTENT OF ONE OR MORE PFAS COMPOUNDS IN GROUNDWATER IN CONCENTRATIONS AT OR ABOVE A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS COMPOUNDS IN GROUNDWATER IN CONCENTRATIONS ONE ORDER OF MAGNITUDE ABOVE A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS COMPOUNDS IN GROUNDWATER IN CONCENTRATIONS TWO ORDERS OF MAGNITUDE ABOVE A RECOMMENDED NR 140 ES

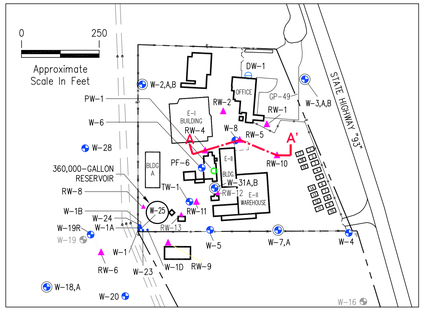
ESTIMATED EXTENT OF PFAS IN GROUNDWATER BASED ON SAMPLES COLLECTED IN DECEMBER 2022 UNLESS OTHERWISE NOTED. EXTENT LINES ARE DASHED WHERE INFERRED.

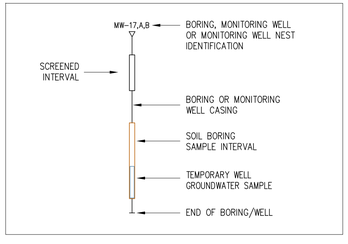
CROSS SECTION A-A'

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 8'
VERTICAL EXAGGERATION: 12.5X

NOTE

THE EXTENT OF VARIOUS SOIL TYPES IS BASED ON BORING LOGS AND WELL CONSTRUCTION DIAGRAMS PREPARED BY PREVIOUS CONSULTANTS AND GANNETT FLEMING. HOWEVER, THE TYPE AND EXTENT OF VARIOUS GEOLOGIC FORMATIONS HAD TO BE ASSUMED IN AREAS WHERE DATA WAS EITHER UNAVAILABLE OR WHERE DIFFERENT CONSULTANTS HAD DESCRIBED WHAT WAS LIKELY THE SAME GEOLOGIC FORMATION DIFFERENTLY. FOR SIMPLICITY, AREAS WHERE SEVERAL THIN LAYERS OF DIFFERENT SOIL TYPES WERE PRESENT WERE COMBINED INTO THE DOMINANT SOIL TYPE FOR THAT STRATUM. THEREFORE, IT IS POSSIBLE THAT SOME SOIL LAYERS ARE SHOWN AS CONTIGUOUS WHEN THEY ARE NOT, AND VICE VERSA. GANNETT FLEMING USED ITS PROFESSIONAL JUDGMENT IN PRESENTING THE GEOLOGICAL FORMATIONS SHOWN ON THIS DRAWING.





PFAS Groups	Chemical Abstract Service #	MCL-based (M) or Risk-based (R)	USEPA SSL	WI DHS Recommended PFAS Standards			Boring/Well ID, Sample Depth (ft bgs) & Date, and Units																										
							RW-4 (13-23)*	PF-7 (1-4)	PF-7 (8-12)	PF-7 (43-47)	AS-9 (22-24)	PF-6 (1-4)	PF-6 (12-16)	PF-5 (1-4)	PF-5 (8-12)	AS-8 (22-24)	RW-5 (13-23)*	AS-7 (20.7-22.7)	PF-4 (1-4)	PF-4 (12-16)	AS-6 (22-24)	PF-3 (1-4)	PF-3 (12-16)	PF-3 (16-20)	PF-2 (1-4)	PF-2 (12-16)	PF-2 (17-21)	PF-2 (43-47)	PF-1 (1-4)	PF-1 (12-16)	PF-1 (18-22)	PF-8 (1-4)	PF-8 (16-18)	PF-8 (18-22)	RW-10 (17-20)
			Soil	Soil	Groundwater		04/22/22	12/06/22	12/06/22	04/17/24	12/05/22	12/06/22	12/06/22	12/06/22	12/06/22	12/05/22	4/22/22	12/05/22	12/06/22	12/06/22	12/05/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	04/17/24	12/06/22	12/06/22	12/06/22	12/06/22	12/06/22	12/05/22	12/05/22
			µg/kg	µg/kg	ng/l	ng/l	ng/l	µg/kg	µg/kg	ng/l	ng/l	µg/kg	µg/kg	µg/kg	µg/kg	ng/l	ng/l	ng/l	µg/kg	µg/kg	ng/l	µg/kg	µg/kg	ng/l	µg/kg	µg/kg	ng/l	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	ng/l	ng/l
PFAS Compounds with Recommended Standards			GW Protection	DC-Ind RCL	NR 140 ES	NR 140 PAL																											
Perfluorooctanoic Acid (PFOA)	335-67-1	M	**0.061**	16,400	**20**[C1]	*2*[C1]	**3,600**	<0.18	9.0	**20**	**6,200**	**1.2**	**3.8**	**2.0**	**11**	**2,700**	**14,000**	**8,700**	**92**	**17**	**3,400**	**18**	**58**	**7,500**	**8.7**	**0.20** J	**16,000**	*3.6*	**14**	**4.1**	**9,300**	**3.0**	**0.28** J	**32,000**	**920**
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	M	**0.03**				**3,600**	**6.6**	**4.4**	**46**	**17,000**	**29**	**150**	**1.3**	**1.9**	**16,000**	**27,000**	**15,000**	**9.2**	**3.4**	**15,000**	**0.50** J	**0.89** J	**12,000**	**0.38** J	<0.2	**71,000**	*6.8*	**18**	**11**	**8,200**	**36**	**2.6**	**1,500**	**130**
Perfluorooctanesulfonamide (PFOSA)	754-91-6	--	NRS	--			*5.0* J	20	0.54 J	<0.90	*4.4* J	58	3.9	<0.24	<0.24	<0.79	**1,000**	**7.0**	<0.25	<0.25	*1.7* J	<0.25	<0.25	**1,400**	<0.25	<0.25	**9.1** J	<0.79	0.36 J	<0.24	**93**	0.3 J	0.99 J	**11**	<0.71
N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	4151-50-2	--	NRS	--	**20**[C2]	*2*[C2]	<25	<1	<0.96	<1.4	<1.2	<1	<0.97	<0.97	<0.95	<1.3	**120**	**11**	<1	<0.98	<1.2	<0.97	<0.99	**40**	<0.99	<0.98	<2.3	<1.3	<0.99	<0.97	**22**	<0.97	2.0	**10**	<1.1
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	--	NRS	--			<25	<0.7	<0.65	<1.9	*2.2* J	3.1	<0.66	<0.66	<0.64	6.9	**3,700**	**610**	<0.67	<0.66	<1.6	<0.66	<0.67	**2,100**	<0.67	<0.66	**190**	<1.7	<0.67	7.2	**55**	1.2	9.0	**120**	**24**
N-Ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	--	NRS	--			<25	<0.27	<0.24	<1.3	<1.1	<0.26	<0.25	<0.25	<0.24	<1.2	**16**	<1.1	<0.25	<0.25	<1.1	<0.25	<0.25	<2.1	<0.25	<0.25	<2.1	<1.2	<0.25	<0.25	**18**	<0.25	<0.25	**7.20** J	**3.6** J
Perfluorononanoic Acid (PFNA)	375-95-1	M	**0.25**	--	**30**	*3*	**31**	<0.16	<0.15	<1.1	**140**	<0.16	0.19 J	<0.15	<0.15	**84**	**140**	**110**	<0.15	<0.15	**99**	<0.15	<0.15	**98**	<0.15	<0.15	**420**	<0.96	**0.66**	**0.25** J	**100**	**0.74** J	<0.15	**140**	1.6 J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	M	**0.17**	--	**40**	*4*	**4,300**	<0.23	**1.7**	*6.20* J	**6,000**	**0.48** J	**2.2**	**4.3**	**0.51** J	**2,400**	**5,700**	**6,500**	**11**	**6.0**	**4,200**	**1.9**	**1.3**	**1,800**	**0.41** J	<0.22	**3,200**	2.00 J	**0.29** J	**0.34** J	**450**	**0.26** J	<0.22	**3,400**	**170**
Hexafluoropropylene oxide dimer acid (HFPO-DA GenX)	13252-13-6	M	**0.015**	--	**300**	*30*	2.8 J	<0.39	<0.35	<1.5	2.7 J	<0.38	<0.36	<0.36	<0.35	1.4 J	14	3.00 J	<0.37	<0.36	2.00 J	<0.36	<0.37	21	<0.37	<0.36	23	<1.3	<0.37	**0.41** J	4.2 J	<0.36	<0.37	9.2 J	2.2 J
Perfluorodecanoic Acid (PFDA)	335-76-2	--	NRS	--	**300**	*60*	7.3 J	<0.18	<0.17	<1.6	12	<0.18	0.27 J	<0.17	<0.16	14	20	12	<0.17	<0.17	30	<0.17	<0.17	12	<0.17	<0.17	*200*	<1.4	0.72 J	<0.17	22	<0.17	<0.17	<2.5	<1.2
Perfluorododecanoic Acid (PFDoA)	307-55-1	R	170	--	**500**	*100*	<6.5	<0.34	<0.32	<0.87	<0.71	<0.34	<0.32	<0.32	<0.31	1 J	<1.3	<0.74	<0.33	<0.32	1.1 J	<0.32	<0.33	<1.4	<0.33	<0.32	<1.4	<0.32	<0.33	<0.32	<1.4	<0.32	<0.33	<1.4	<0.69
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	R	**45**	--	**3,000**	*600*	<7.5	0.38 J	<0.31	<1.2	<1	<0.33	<0.31	<0.31	<0.3	<1.1	<1.5	1.3 J	<0.32	<0.32	<1	<0.31	<0.32	<1.9	<0.32	<0.32	<1.9	<1.1	<0.32	<0.31	<1.9	<0.31	<0.32	<1.9	<0.97
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	--	NRS	--	**3,000**	*600*	NA	<0.66	<0.6	<0.71	<0.58	<0.65	<0.61	<0.61	<0.6	<0.62	NA	0.66 J	<0.63	<0.62	<0.58	<0.61	<0.63	3.7 J	<0.62	<0.62	11	<0.62	<0.63	<0.61	<1.1	<0.61	<0.62	<1.1	<0.56
Perfluorobutanoic Acid (PFBA)	375-22-4	R	**6.5**	--	**10,000**	*2,000*	2,100	<0.3	<0.27	15	1,400	0.69 J	0.81 J	<0.28	<0.27	620	**16,000**	*2,800*	<0.29	<0.28	1,000	<0.28	<0.28	**23,000**	<0.28	<0.28	**13,000**	8.5	<0.28	<0.28	610	<0.28	<0.28	1,800	340
Perfluorotetradecanoic Acid (PFTeA)	376-06-7	R	**9400**	--	**10,000**	*2,000*	NA	<0.24	<0.22	<3.3	<2.7	<0.24	<0.22	<0.22	<0.22	<2.9	NA	<2.8	<0.23	<0.23	<2.7	<0.22	<0.23	<5.3	<0.23	<0.23	<5.3	<2.9	<0.23	<0.22	<5.3	<0.22	<0.23	<5.3	<2.6
Perfluorohexanoic Acid (PFHxA)	307-24-4	R	**2.4**	--	**150,000**	*30,000*	1,500	0.25 J	0.24 J	10	1,300	0.23 J	1	<0.15	<0.15	960	5,900	3,800	0.28 J	0.27 J	1,400	0.40 J	0.55 J	9,200	**2.6**	0.19 J	7,200	<1.3	0.66 J	<0.15	500	<0.16	<0.16	1,300	180
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	R	**3.0**	--	**450,000**	*90,000*	8,100	<0.13	0.42 J	62	2,800	0.25 J	1.6	<0.13	<0.13	830	20,000	3,300	0.30 J	0.47 J	1,600	0.68 J	1.1 J	20,000	0.46 J	0.20 J	17,000	3.70 J	0.38 J	<0.12	1,200	<0.13	<0.13	1,600	380
PFAS Compounds without Recommended Standards																																	
Perfluoropentanoic Acid (PFPeA)	2706-90-3	--	NRS	--	NRS	NRS	1,100	0.44 J	0.25 J	19	880	0.62 J	0.38 J	<0.12	<0.12	790	6,200	2,000	<0.12	0.13 J	990	0.22 J	0.19 J	9,300	0.17 J	<0.12	5,900	<1.4	0.39 J	<0.12	700	<0.12	<0.12	1,500	230
Perfluoroheptanoic Acid (PFHpA)	375-85-9	--	NRS	--	NRS	NRS	870	<0.25	<0.23	2.80	400	<0.25	0.37 J	1.6	<0.23	260	1,400	470	0.47 J	<0.24	310	2.3	<0.24	1,500	1.4	<0.24	1,400	<1.9	0.90 J	<0.24	150	<0.24	<0.24	880	100
Perfluorotridecanoic Acid (PFTriA)	72629-94-8	--	NRS	--	NRS	NRS	<6.5	<0.73	<0.67	<2.4	<2	<0.72	<0.68	<0.68	<0.66	<2.1	<1.3	<2.1	<0.69	<0.68	<2	<0.68	<0.69	<3.9	<0.69	<0.68	<3.9	<2.1	<0.69	<0.67	<3.9	<0.68	<0.69	<3.9	<1.9
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	--	NRS	--	NRS	NRS	2,700	<0.46	<0.42	0.84	1,200	<0.45	<0.43	<0.43	<0.42	550	2,400	1,500	0.49 J	<0.43	930	<0.43	<0.44	1,000	0.45 J	<0.43	1,000	<0.62	<0.44	<0.43	20	<0.43	<0.44	380	14
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	--	NRS	--	NRS	NRS	190	<0.59	0.62 J	<0.71	1,100	<0.58	0.85 J	<0.55	<0.54	530	750	1,600	150	<0.56	1,200	<0.55	<0.56	420	<0.56	<0.56	1,300	<0.63	<0.56	<0.55	400	2.9	<0.56	200	8.5
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	--	NRS	--	NRS	NRS	<15	0.24 J	<0.17	<0.62	31	0.51 J	0.99 J	<0.17	<0.17	47	<59	55	<0.18	<0.17	48	<0.17	<0.18	6.5 J	<0.18	<0.17	31	<0.55	<0.18	<0.17	3.90 J	<0.17	<0.18	3.9 J	<0.49
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	--	NRS	--	NRS	NRS	<7.5	8.5	<0.57	<1.7	1.8 J	14	1.1 1	<0.58	<0.56	2 J	<30	2.2 J	<0.59	<0.59	1.90 J	<0.58	<0.59	<2.7	<0.59	<0.59	2.90 J	<1.5	<0.59	<0.58	<2.7	<0.58	<0.59	<2.7	<1.4
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	--	NRS	--	NRS	NRS	NA	<0.28	<0.26	<0.78	<0.64	<0.28	<0.26	<0.26	<0.25	<0.69	NA	<0.67	<0.27	<0.26	<0.64	<0.26	<0.27	<1.2	<0.27	<0.26	<1.2	<0.69	<0.27	<0.26	<1.2	<0.26	<0.27	<1.2	<0.62
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	--	NRS	--	NRS	NRS	NA	<0.32	<0.29	<1.2	<0.96	<0.31	<0.3	<0.3	<0.29	<1	<0.81	<1	<0.3	<0.3	<0.97	<0.3	<0.3	5.9 J	<0.3	<0.3	11	<1.0	<0.3	<0.3	<1.9	<0.3	<0.3	<1.9	<0.93
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	--	NRS	--	NRS	NRS	260	1.8	<0.28	<2.4	230	<0.3	0.77 J	<0.29	<0.28	330	200	280	<0.29	<0.29	250	<0.29	<0.29	230	<0.29	<0.29	610	<2.1	<0.29	<0.29	95	<0.29	<0.29	120	78
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	--	NRS	--	NRS	NRS	12 J	<0.58	<0.53	<1.4	24	<0.57	<0.54	<0.54	<0.52	29	3.3 J	1.7 J	<0.55	<0.54	57	<0.54	<0.55	<2.3	<0.55	<0.54	<2.3	<1.3	<0.55	<0.53	<2.3	<0.54	<0.55	<2.3	<1.1
N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	31506-32-8	--	NRS	--	NRS	NRS	<2.3	5	<0.29	<1.0	<0.81	2.7	0.71 J	<0.29	<0.28	<0.88	1.5 J	<0.85	<0.3	<0.3	<0.82	<0.29	<0.3	2.00 J	<0.3	<0.3	<1.6	<0.88	<0.3	<0.29	<1.6	<0.29	<0.3	<1.6	<0.79
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	--	NRS	--	NRS	NRS	5.8 J	2.9	<0.66	<0.81	1 J	4	0.69 J	<0.67	<0.65	8.9	67	20	<0.68	<0.67	3.10 J	<0.67	<0.68	13	<0.68	<0.67	8.10 J	<0.71	<0.68	<0.66	4.60 J	<0.67	<0.68	<1.3	<0.64
Total PFAS Concentration							28,384	46	17	182	38,730	115	170	9.2	13	26,164	104,632	46,784	264	27	30,524	24	62	89,652	15	0.59	138,516	25	36	23	21,948	44	15	44,981	2,582

NOTES:
C1 = The WDNR proposed a ES abd PAL of 20 ng/l and 2 ng/l, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.
C2 = DHS recommended a combined ES of 20 ng/l and a combined PAL of 2 ng/l for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.
Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either italicized or in bold, respectively, even if one or more compounds are below their recommended combined PAL or ES.
Regional Screening Levels (RSLs)- and Maximum Contaminant Levels (MCLs)-based Soil Screening Levels (SSLs) were taken from US EPA May 2024 RSL table with Target Risk 1E-6 and Target Hazard Quotient 1.0 https://semspub.epa.gov/work/HQ/404491.pdf
Direct Contact - Industrial = 16.4 mg/kg = 16,400 ug/kg
NRS - Not recommended USEPA or WDHS standard
* - The depth to water below the ground surface was not measured in RW-4 and RW-5 when the samples were collected. The depths shown in the table are the screened intervals; however, the samples were collected from the upper three feet of the water column in each well.

CHECKED BY AWM ON 11/12/24
132224
2024_55929-007.cam_PNV_001

ENGINEER

NO	REVISION NOTES	DATE	REVIEWED

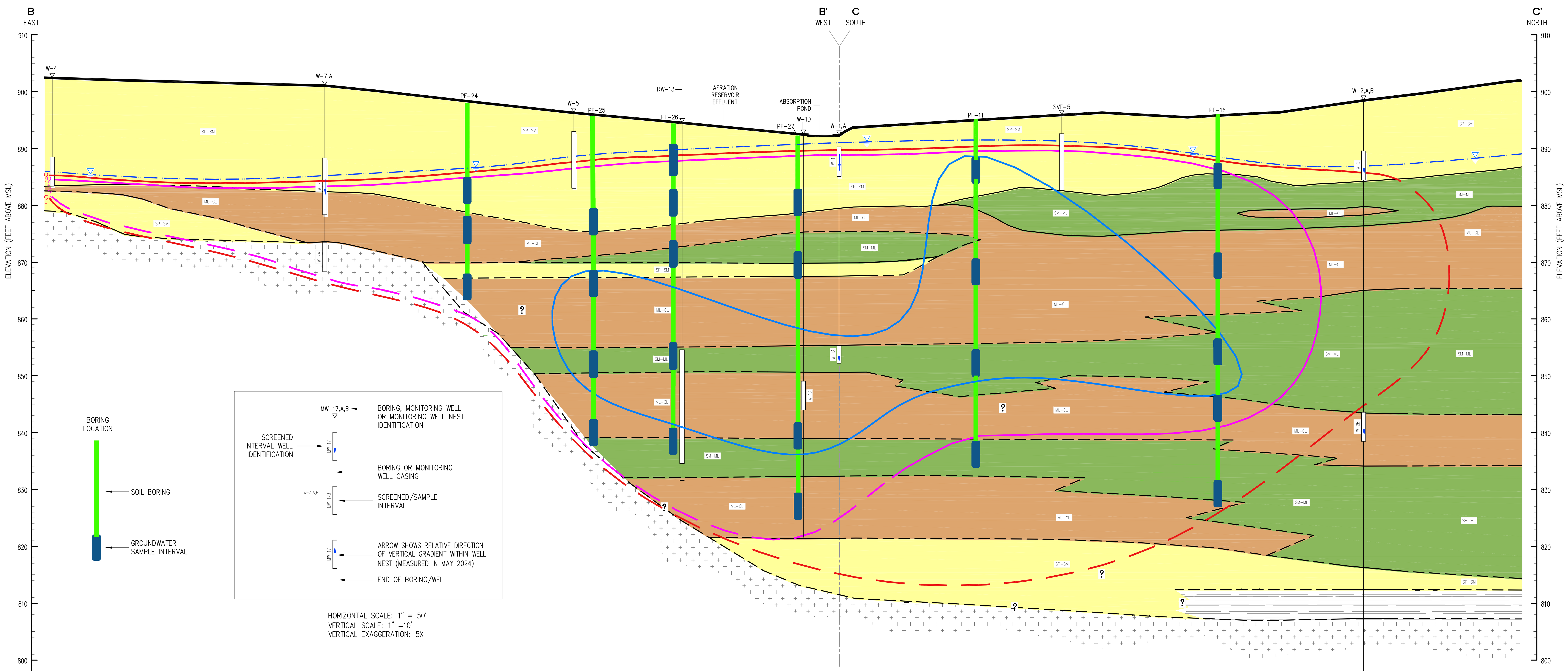
DRAWN: JSD
SCALE: AS NOTED
DESIGNED: AWM
JOB No.: 55929.007
APPROVED: AWM
DATE: NOV 2024

GANNETT FLEMING
HARRISBURG, PENNSYLVANIA
MADISON, WISCONSIN

PROJECT
WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TITLE
CROSS SECTION A-A'
BULK LOADING INVESTIGATION AREA

DRAWING No.
1



LEGEND

- SM-ML: PREDOMINANTLY A MIXTURE OF SILT AND VERY FINE SANDS, OFTEN LAMINATED, WITH VARYING AMOUNTS OF CLAY
- SP-SM: PREDOMINANTLY POOR-GRADED SANDS AND SILTY SAND WITH OCCASIONAL SILT OR CLAY LAYERS
- ML-CL: PREDOMINANTLY SILT AND CLAYS WITH VARYING AMOUNTS OF VERY FINE SAND
- SHALE
- SANDSTONE
- ESTIMATED EXTENT OF ONE OR MORE PFAS AT CONCENTRATIONS AT OR ABOVE A CURRENT RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS AT CONCENTRATIONS AT OR ABOVE AN ORDER OF MAGNITUDE GREATER THAN A CURRENT RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF ONE OR MORE PFAS AT CONCENTRATIONS AT MORE THAN TWO ORDERS OF MAGNITUDE GREATER THAN A CURRENT RECOMMENDED NR 140 ES
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- WATER TABLE

ESTIMATED EXTENT OF PFAS IN GROUNDWATER BASED ON CONCENTRATIONS MEASURED IN SAMPLES COLLECTED BETWEEN DECEMBER 2023 AND JUNE 2024 UNLESS OTHERWISE NOTED. DASHED WHERE INFERRED.

NOTE

THE EXTENT OF VARIOUS SOIL TYPES IS BASED ON BORING LOGS AND WELL CONSTRUCTION DIAGRAMS PREPARED BY PREVIOUS CONSULTANTS AND GANNETT FLEMING. HOWEVER, THE TYPE AND EXTENT OF VARIOUS GEOLOGIC FORMATIONS HAD TO BE ASSUMED IN AREAS WHERE DATA WAS EITHER UNAVAILABLE OR WHERE DIFFERENT CONSULTANTS HAD DESCRIBED WHAT WAS LIKELY THE SAME GEOLOGIC FORMATION DIFFERENTLY. FOR SIMPLICITY, AREAS WHERE SEVERAL THIN LAYERS OF DIFFERENT SOIL TYPES WERE PRESENT WERE COMBINED INTO THE DOMINANT SOIL TYPE FOR THAT STRATUM. THEREFORE, IT IS POSSIBLE THAT SOME SOIL LAYERS ARE SHOWN AS CONTIGUOUS WHEN THEY ARE NOT, AND VICE VERSA. GANNETT FLEMING USED ITS PROFESSIONAL JUDGMENT IN PRESENTING THE GEOLOGICAL FORMATIONS SHOWN ON THIS DRAWING.

Boring/Well ID	W-4	W-7	W-7A	PF-24			W-5	PF-25				RW-13	PF-26					PF-27				WI DHS/WDNR Recommended PFAS Standard (ng/l)	
Sample Depth (ft bgs)	(17-20)	(15-18)	(28-33)	(13-17)	(20-24)	(30-34)	(7-10)	(15-19)	(26-30)	(40-44)	(52-56)	(40-63)	(5-10)	(13-17)	(22-26)	(40-44)	(55-59)	(11-15)	(22-26)	(52-56)	(64-68)		
Sample Date	05/28/24	05/29/24	05/29/24	12/06/23	04/18/24	04/18/24	05/29/24	04/18/24	04/18/24	04/18/24	04/19/24	05/25/23	12/06/23	04/17/24	04/17/24	04/17/24	04/17/24	04/15/24	04/15/24	04/15/24	04/15/24	NR 140 ES	NR 140 PAL
Perfluorooctanoic Acid (PFOA)	**53**	**340**	**820**	**230**	**400**	**19**	**240**	**270**	**910**	**2,300**	**400**	**1,300**	**350**	**370**	**540**	**1,200**	**260**	**390**	**740**	**800**	**710**	**20**[C1]	*2*[C1]
Perfluorooctanesulfonic Acid (PFOS)	**190**	**110**	**89**	**750**	**700**	**210**	**130**	**310**	**1,200**	**340**	**240**	**830**	**230**	**300**	**340**	**840**	**42**	**270**	**850**	**1,700**	**280**		
Perfluorooctanesulfonamide (PFOSA)							*4.9 J*	**38**		*3.6 J*		*7.9*	**26**	*15*		*5.0 J*		*13*	*0.98 J*	*3.9 J*		**20**[C2]	*2*[C2]
N-Ethylperfluorooctanesulfonamidoacetic Acid								**4.9 J**				*7.3*	**4.8**	*2.9 J*				*5.9*	*3.2 J*	*5.2 J*			
Perfluorononanoic Acid (PFNA)	*3.6 J*			*7.5*	*4.2 J*		**45**	*5.0 J*	*6.5*	*17*		*22*	*4.8 J*	*4.4 J*	*6.8*	**37**		*4.8 J*	*5.2*	*18*	*7.0*	**30**	*3*
Perfluorohexanesulfonic Acid (PFHxS)	*5.4*	**110**	*30*	**58**	**430**	*26*	*17*	**87**	**240**	**130**	**110**	**360**	**110**	**93**	**160**	**120**	**210**	**110**	**230**	**180**	**220**	**40**	*4*

Boring/Well ID	W-1	W-1A	W-1D	PF-11				SVE-5	PF-16					W-2	W-2B	W-2A	WI DHS/WDNR Recommended PFAS Standard (ng/l)	
Sample Depth (ft bgs)	(1-4)	(35-40)	(43-48)	(7-11)	(25-29)	(41-45)	(57-61)	(12-15)	(9-13)	(25-29)	(40-44)	(50-54)	(65-69)	(12-15)	(50-55)	(105-110)		
Sample Date	05/29/24	05/29/24	05/29/24	12/04/23	04/16/24	04/16/24	04/16/24	08/16/23	12/05/23	04/18/24	04/18/24	04/18/24	04/19/24	05/28/24	05/28/24	05/29/24	NR 140 ES	NR 140 PAL
Perfluorooctanoic Acid (PFOA)	**47**	**970**	**1200**	**840**	**1,100**	**1,500**	**39**	**490**	**170**	**300**	**5,900**	**410**	**26**	**54**	*3.7*	*3.0*	**20**[C1]	*2*[C1]
Perfluorooctanesulfonic Acid (PFOS)	**240**	**1,300**	**540**	**3,200**	**2,000**	**2,700**	**64**	**870**	**400**	**710**	**860**	**180**	**3.0**	**77**	*1.1 J*			
Perfluorooctanesulfonamide (PFOSA)	**78**	**83**	**24**	**32**			*1.70 J*	**78**	**26 J**								**20**[C2]	*2*[C2]
N-Ethylperfluorooctanesulfonamidoacetic Acid	**3.6 J**	**3.6 J**		**34**			*3.0 J*	**130**										
Perfluorononanoic Acid (PFNA)		*8.7*	*9.8*	*26*	*9.5*	*20*		*12*		*22*	*14*						**30**	*3*
Perfluorohexanesulfonic Acid (PFHxS)	*18*	**290**	**220**	**250**	**250**	**520**	*15*	**270**	**66 J**	**56**	**630**	**43**	*8.5*	*32*	*4.5 J*		**40**	*4*

NOTES:

Only wells with one or more PFAS at concentrations exceeding a proposed Enforcement Standard (ES) are shown on this table.

Total PFAS concentrations include compounds without a recommended NR 140 ES.

Concentrations are in nanograms per liter (ng/L), equivalent to parts per trillion (ppt), and only concentrations above a proposed NR 140 Enforcement Standard (ES) or Preventative Action Limit (PAL) are shown.

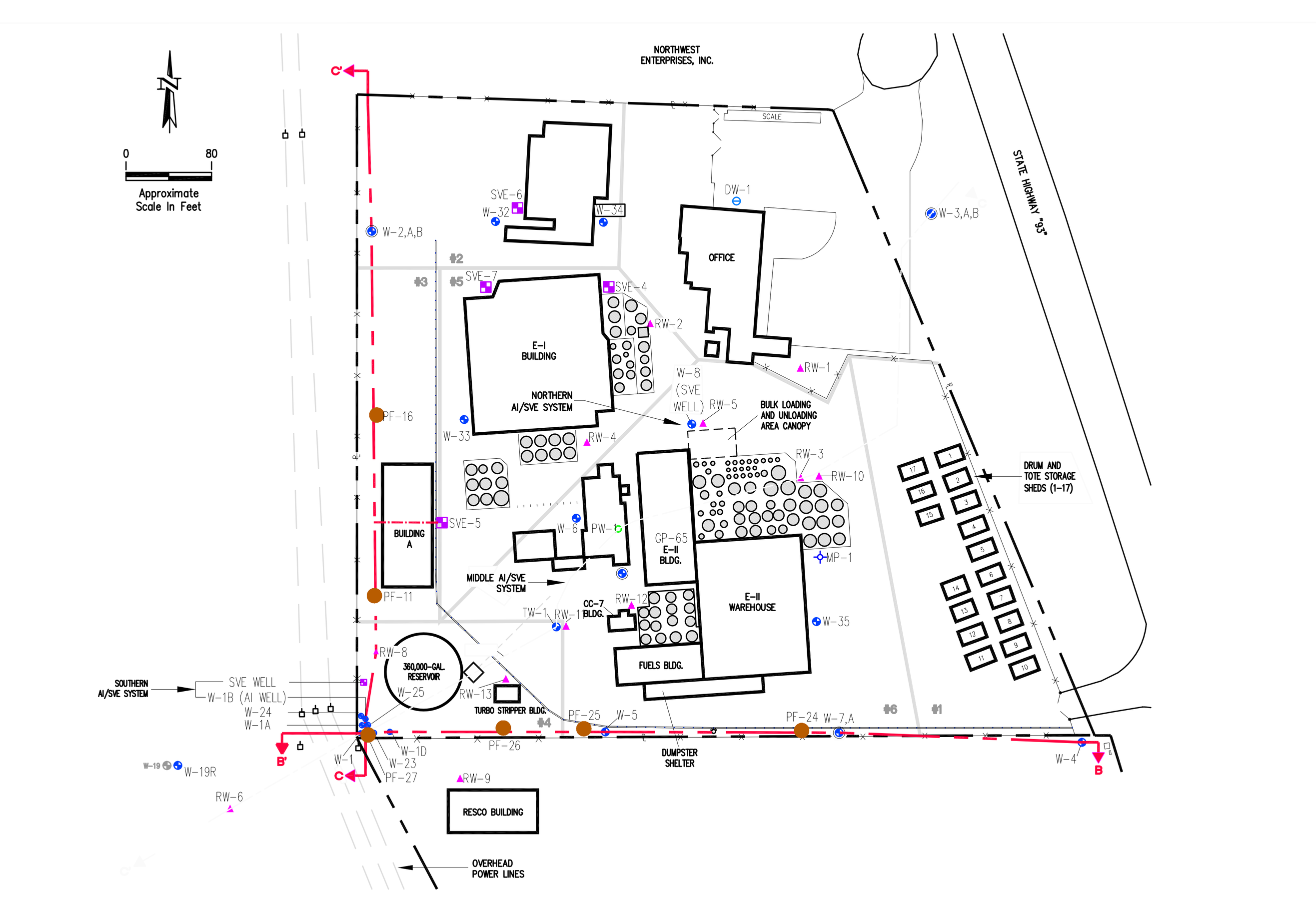
Concentrations at or above a proposed NR 140 ES are in **bold**.

Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined PAL or ES.

C1 = The WDNR proposed a ES and PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed September 2023 revisions to the NR 140 Code.

C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code.

NPS = No proposed standard.



2024_55929-007_awm_PINV_D02 112124 PLOT SCALE=1 CONCENTRATIONS AND CONTOURS CHECKED BY AWM ON 11/12/24

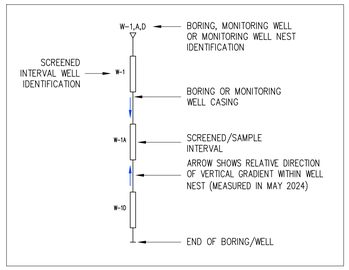
ENGINEER		DRAWN	SCALE
		EMR	AS NOTED
		DESIGNED	JOB No.
		AWM	55929-007
		APPROVED	DATE
	NO / REVISION NOTES / DATE / REVIEWED	AWM	NOV 2024

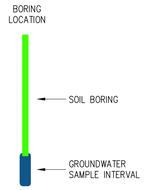
GANNETT FLEMING
HARRISBURG, PENNSYLVANIA MADISON, WISCONSIN

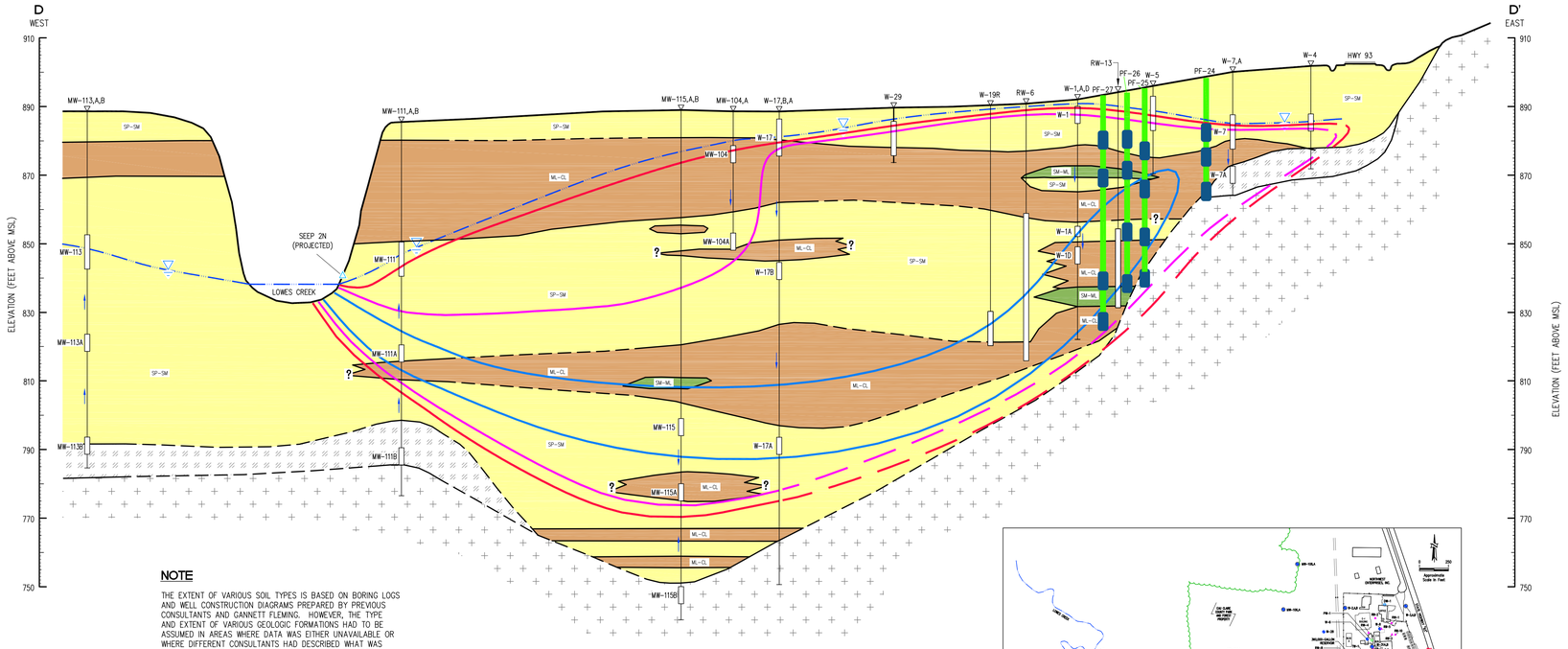
PROJECT
WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TITLE
CROSS SECTIONS B-B' AND C-C'

DRAWING No.
2







NOTE

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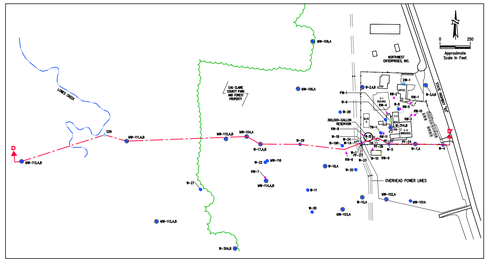
CROSS SECTION D-D'

HORIZONTAL SCALE: 1" = 200'
VERTICAL SCALE: 1" =20'
VERTICAL EXAGGERATION: 10X



LEGEND

- SM-ML — PREDOMINANTLY A MIXTURE OF SILT AND VERY FINE SANDS, OFTEN LAMINATED, WITH VARYING AMOUNTS OF CLAY
- SP-SM — PREDOMINANTLY POOR-GRADED SANDS AND SILTY SAND WITH OCCASIONAL SILT OR CLAY LAYERS
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- WEATHERED SANDSTONE
- SANDSTONE
- ESTIMATED EXTENT OF ONE OR MORE PFAS AT CONCENTRATIONS GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF PFAS AT CONCENTRATIONS ONE ORDER OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
- ESTIMATED EXTENT OF PFAS AT CONCENTRATIONS TWO ORDERS OF MAGNITUDE GREATER THAN A RECOMMENDED NR 140 ES
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ESTIMATED EXTENT OF PFAS IN GROUNDWATER BASED ON CONCENTRATIONS MEASURED IN SAMPLES COLLECTED BETWEEN DECEMBER 2023 AND JUNE 2024 UNLESS OTHERWISE NOTED. DASHED WHERE INFERRED.

CROSS-SECTION D-D'

Parameter	C#	Sample ID, Date Collected, & Depth of Sample from Boring (ft bgs)																																				NR 140 PAL	NR 140 ES
		SW-3	Seep 2N	MW-111	MW-111A	MW-111B	MW-115	MW-115A	MW-115B	MW-104	MW-104A	W-17	W-17B	W-17A	W-29	W-19R	RW-6	Abs. Pond	W-1	W-1A	PF-27				W-1D	PF-26					RW-13	PF-25				W-5	PF-24			W-7	W-7A	W-4		
																					11-15'	22-26'	52-56'	64-68'		5-10'	13-17'	22-26'	40-44'	55-59'		15-19	26-30	40-44	52-56		13-17	20-24	30-34					
		6/24	6/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/24	5/23	6/24	5/24	5/24	4/24				5/24	12/23	4/24				5/23	4/24				5/24	12/23	4/24		5/24	5/24	5/24		
Carboxylic Acids																																									
PFBA	4	11	6.9	6.8	520	22	*2,800*	1,100	6.1	26	360	150	850	1,700	81	500	*2,200*	171	92	980	430	1,100	230	390	1,600	440	420	800	480	31	1,300	370	810	500	40	160	340	340	28	700	200	70	*2,000*	**10,000**
PFPeA	5	5.5		4.6 J	300	9.1	470	300	3.5 J	20	240	120	760	750	54	160	1,000	31 J	63	680	330	590	83	150	990	310	320	430	880	58	700	250	580	610	62	370	180	320	31	2,000	480	11	*NRS*	**NRS**
PFHxA	6	3.3 J		8.0	320	9.1	460	440	4.0 J	27	180	170	530	1,000	94	210	900	41.7 J	77	1,500	600	1,100	100	200	970	630	530	770	590	49	1,100	440	1,100	420	69	240	140	250	28	1,100	150	6.4	*30,000*	**150,000**
PFHpA	7	3.5 J		2.4 J	130	1.9 J	150	93		9.9	23	73	130	340	40	75	220		25	450	230	310	33	68	310	220	200	250	250	8.1	370	140	280	200	14	210	69	120	3.90 J	160	20	3.3 J	*NRS*	**NRS**
PFOA	8	*11*	0.76 J	**28**	**5,900**	*14*	**4,600**	**360**	1.3 J	**44**	**93**	**220**	**650**	**12,000**	**170**	**400**	**1,200**	**25.5 J**	**47**	**970**	**390**	**740**	**800**	**710**	**1,200**	**350**	**370**	**540**	**1,200**	**260**	**1,300**	**270**	**910**	**2,300**	**400**	**240**	**230**	**400**	**19**	**340**	**820**	**53**	*2* [C1]	**20** [C1]
PFNA	9											*6.5*	*10*		*8.8*	*6.5*	**30**		*2.7 J*	*8.7*	*4.80 J*	*5.2*	*18*	*7.0*	*9.8*	*4.8 J*	*4.40 J*	*6.8*	**37**		*22*	*5.00 J*	*6.5*	*17*		*45*	*7.5*	*4.20 J*		*0.83 J*		*3.6 J*	*3*	**30**
PFDA	10																		*2.4 J*	*4.6 J*		*4.30 J*			*1.6 J*		*1.50 J*	*4.40 J*	*5.7*		*2.8 J*	*1.80 J*		*2.40 J*		*41*							*60*	**300**
PFUnA	11																															*1.10 J*										*600*	**3,000**
PFDoA	12																															*1.40 J*										*100*	**500**
Sulfonic Acids																																									
PFBS	4	1.6 J	0.56 J	5.8	19	1.7 J	850	800	*2.2 J*	17	240	99	480	1,200	99	290	610	28.6 J	43	400	240	300	110	180	550	270	250	250	190	23	440	170	270	390	32	14	33	73	19	470	110	110	*90,000*	**450,000**
PFPeS	5			1.2 J	6.6		18	27	1.6 J	*2.7 J*	19	12	130	34	5.9	60	160		*3.8 J*	75	22	56	18	42	80	25	20	38	15	7.9	62	18	60	17	*4.90 J*	*1.5 J*	*3.2 J*	34	*3.90 J*	12	*2.9 J*	*1.7 J*	*NRS*	**NRS**
PFHxS	6	0.93 J		1.7 J	*31*	1.2 J	*29*	*23*	*13*	*13*	*18*	**68**	**230**	**60**	**41**	**200**	**480**		*18*	**290**	**110**	**230**	**180**	**220**	**220**	**110**	**93**	**160**	**120**	**210**	**360**	**87**	**240**	**130**	**110**	*17*	**58**	**430**	*26*	**110**	*30*	*5.4*	*4*	**40**
PFHpS	7							1.2 J		0.93 J		4.3 J	6.4		2.5 J	26	25		*2.8 J*	7.5	10	6.6	120	36	13	6.3	7.7	9.6	26	8.2	19	5.50 J	5.20 J	21	17	1.1 J	4.3 J	5.30 J	5.90 J	0.83 J	2.3 J	1.8 J	*NRS*	**NRS**
PFOS	8	*2.0*				*1.8 J*	**0.91 J**	**5.7**		**74**	**9.6**	**490**	**89**	**3.5**	**320**	**210**	**950**	**103 J**	**240**	**1,300**	**270**	**850**	**1,700**	**280**	**540**	**230**	**300**	**340**	**840**	**42**	**830**	**310**	**1,200**	**340**	**240**	**130**	**750**	**700**	**210**	**110**	**89**	**190**	*2* [C1]	**20** [C1]
PFNS	9																		*1.2 J*	*1.7 J*		*1.10 J*						*1.50 J*	*1.00 J*			*0.77 J*				*0.71 J*							*NRS*	**NRS**
PFDS	10																		*2.2 J*		*1.50 J*						*1.60 J*				*10*											*NRS*	**NRS**
4:2 FTS	6												1.2 J					1.3 J		*4.3 J*		*1.40 J*			*2.4 J*	*1.1 J*		*1.00 J*	*1.40 J*		*1.1 J*		*1.80 J*	*2.90 J*									*NRS*	**NRS**
6:2 FTS	8				5.0	2.3 J		11				29	140	4.1 J	2.4 J	19	73	54.4 J	58	190	67	170	13	26	110	31	59	96	480		190	40	100	440		86				66	6.2		*NRS*	**NRS**
8:2 FTS	10																7.0		*1.7 J*	86		13			5.8 J	*1.4 J*		*4.90 J*	35		12	*1.70 J*		11		57						*NRS*	**NRS**
Sulfonamides, Sulfomodioacetic Acids, Sulfonamidoethanols																																									
PFOSA	8													*3.1 J*				**40.8 J**	**78**	**83**	*13*	0.98 J	*3.90 J*	0.96 J	**24**	**26**	*15*	1.2 J	*5.00 J*		*7.9*	**38**	<0.79	*3.60 J*		*4.9 J*							*2* [C2]	**20** [C2]
NMeFOSA	9																	544			2.40 J					*4.8*	*2.90 J*					3.10 J											*NRS*	**NRS**
NMeFOSAA	11					0.73 J											0.77 J	*55.2 J*	*4.8 J*	3.6 J	17	16				5.9	4.70 J	11	1.60 J		3.9 J	10	1.80 J	1.00 J									*NRS*	**NRS**
NEtFOSAA	12																**33**	**43.5 J**	**3.6 J**		*5.9*	*3.20 J*	*5.20 J*		**2.9 J**						*7.3*	**4.90 J**				0.83 J							*2* [C2]	**20** [C2]
NMeFOSE	11																	*82.2 J*		16																							*NRS*	**NRS**
NEtFOSE	12																	**43.2 J**																									*2* [C2]	**20** [C2]
Replacement Chemicals																																									
HFPO-DA	6													6.9			1.8 J									2.3 J					1.5 J			1.70 J		2.5 J	3.3 J					*30*	**300**

NOTES:
PFAS concentrations in nanograms per liter (ng/ℓ) equivalent to parts per trillion (ppt).
All samples were analyzed for PFAS using Method E537 Modified; only compounds detected in one or more samples are shown in this table. PFAS were not detected in any of the groundwater samples collected from the MW-113/A/B well nest, so those wells are not shown in the table.
C1 = The WDNR proposed an ES and PAL of 20 ng/ℓ and 2 ng/ℓ, respectively, for PFOA and PFOS, separately and combined, as part of its proposed 9/15/23 revisions to the NR 140 Code.
C2 = DHS recommended a combined ES of 20 ng/ℓ and a combined PAL of 2 ng/ℓ for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code (Nov. 2020).
Detected concentrations at or above a recommended NR 140 PAL are *italicized*; those at or above a recommended NR 140 ES are **bold**.
Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below their recommended combined Wisconsin Department of Health Service recommended NR 140 enforcement standards (ES) and preventative action limit (PAL) as part of Cycle 11 recommended revisions to the NR 140 Code.
J flag denotes concentration above its method detection limit (MDL) but below the method quantification limit (MQL).
NRS = No reccomended standard yet from Cycle 11.
C# – number of carbon atoms in compound.

NO	REVISION NOTES	DATE	REVIEWED

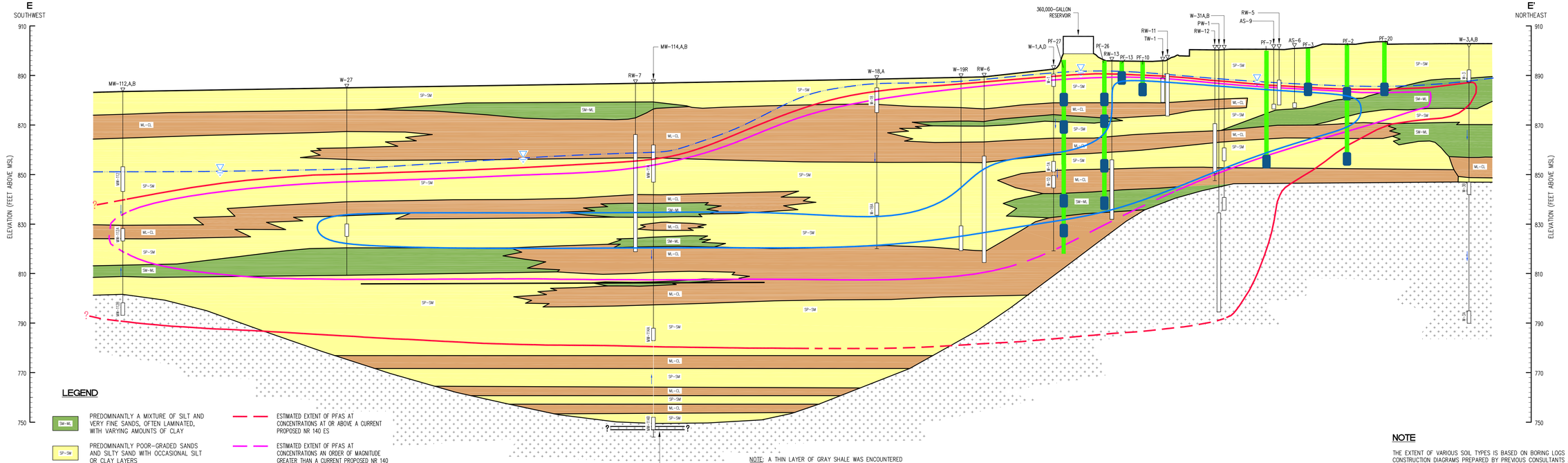
DRAWN: JSD
DESIGNED: AWM
APPROVED: AWM
SCALE: AS NOTED
JOB No.: 55929-007
DATE: NOV. 2024

GANNETT FLEMING
HARRISBURG, PENNSYLVANIA MADISON, WISCONSIN

PROJECT
WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TITLE
CROSS SECTION D-D'
WITH ESTIMATED VERTICAL EXTENT OF PFAS
DECEMBER 2023 - MAY 2024

DRAWING No.
3



LEGEND

- SM-ML — PREDOMINANTLY A MIXTURE OF SILT AND VERY FINE SANDS, OFTEN LAMINATED, WITH VARYING AMOUNTS OF CLAY
- SP-SM — PREDOMINANTLY POOR-GRADED SANDS AND SILTY SAND WITH OCCASIONAL SILT OR CLAY LAYERS
- ML-CL — PREDOMINANTLY SILT AND CLAYS WITH VARYING AMOUNTS OF VERY FINE SAND
- WEATHERED SANDSTONE
- SANDSTONE
- ESTIMATED EXTENT OF PFAS AT CONCENTRATIONS AT OR ABOVE A CURRENT PROPOSED NR 140 ES
- ESTIMATED EXTENT OF PFAS AT CONCENTRATIONS AN ORDER OF MAGNITUDE GREATER THAN A CURRENT PROPOSED NR 140 ES
- ESTIMATED EXTENT OF PFAS AT CONCENTRATIONS AT MORE THAN TWO ORDERS OF MAGNITUDE GREATER THAN A PROPOSED NR 140 ES
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- WATER TABLE

ESTIMATED EXTENT OF PFAS IN GROUNDWATER BASED ON CONCENTRATIONS MEASURED IN SAMPLES COLLECTED BETWEEN DECEMBER 2023 AND JUNE 2024 UNLESS OTHERWISE NOTED. DASHED WHERE INFERRED.

NOTE: A THIN LAYER OF GRAY SHALE WAS ENCOUNTERED IN BORING FOR MW-114B FROM 137 TO 138.5 FEET BGS. TOTAL BORING DEPTH 140 FEET BGS.

CROSS SECTION E-E'

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" =20'
VERTICAL EXAGGERATION: 5X

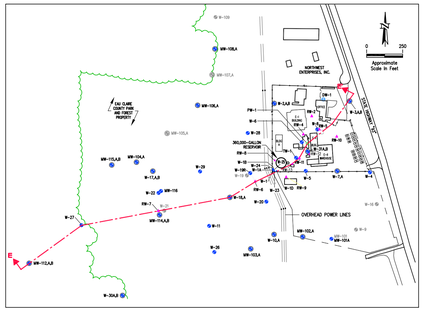
NOTE

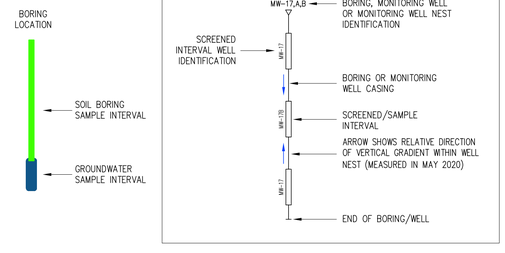
THE EXTENT OF VARIOUS SOIL TYPES IS BASED ON BORING LOGS AND WELL CONSTRUCTION DIAGRAMS PREPARED BY PREVIOUS CONSULTANTS AND GANNETT FLEMING. HOWEVER, THE TYPE AND EXTENT OF VARIOUS GEOLOGIC FORMATIONS HAD TO BE ASSUMED IN AREAS WHERE DATA WAS EITHER UNAVAILABLE OR WHERE DIFFERENT CONSULTANTS HAD DESCRIBED WHAT WAS LIKELY THE SAME GEOLOGIC FORMATION DIFFERENTLY. FOR SIMPLICITY, AREAS WHERE SEVERAL THIN LAYERS OF DIFFERENT SOIL TYPES WERE PRESENT WERE COMBINED INTO THE DOMINANT SOIL TYPE FOR THAT STRATUM. THEREFORE, IT IS POSSIBLE THAT SOME SOIL LAYERS ARE SHOWN AS CONTIGUOUS WHEN THEY ARE NOT, AND VICE VERSA. GANNETT FLEMING USED ITS PROFESSIONAL JUDGMENT IN PRESENTING THE GEOLOGICAL FORMATIONS SHOWN ON THIS DRAWING.

CROSS-SECTION E-E'

Parameter	C#	Sample ID, Date Collected, and Depth of Samples from Borings (ft bgs)																																			NR 140 PAL	NR 140 ES
		MW-112	MW-112A	MW-112B	W-27	RW-7	MW-114	MW-114A	MW-114B	W-18	W-18A	W-19R	RW-6	W-1	W-1A	W-1D	PF-27					PF-26					RW-13	PF-13	PF-10	TW-1	RW-11	RW-12	PW-1	W-31A	W-31B	PF-7	AS-9	RW-5	AS-6	PF-3	PF-2			PF-20	W-3		
		5/24	5/24	5/24	5/24	4/22	5/24	5/24	10/21	5/24	5/24	5/24	5/23	5/24	5/24	5/24	11-15' 4/24	22-26' 12/23	52-56' 12/23	64-68' 12/23	5-10' 12/23	13-17' 4/24	22-26' 4/24	40-44' 4/24	55-59' 4/24	5/23	2-6' 12/23	7-11' 12/23	5/24	6/24	5/23	6/24	5/24	5/24	43-47' 4/24	12/22	5/23	12/22	16-20' 12/23	17-21' 12/22	44-48' 4/24	17-21' 12/23	5/24			
Carboxylic Acids																																													
PFBA	4	4.9	170	470	430	1,400	1,200	56	*3.8 J*	490	1,500	500	*2,200*	92	980	1,600	430	1,100	230	390	440	420	800	480	31	1,300		560	440	250	*3,400*	9.1	270	9.5	15	1,400	1,900	1,000	**23,000**	**13,000**	8.5	190	*7.4 J*	*2,000*	**10,000**
PFPeA	5	*2.0 J*	120	210	510	1,200	800	34	14	380	1,000	160	1,000	63	680	990	330	590	83	150	310	320	430	880	58	700	*90 J*	300	430	310	2,000	8.6	230	9.6	19	880	1,300	990	9,300	5,900		260	5.0 J	NRS	NRS
PFHxA	6	*1.2 J*	130	140	390	990	740	34	7.6	500	900	210	900	77	1,500	970	600	1,100	100	200	630	530	770	590	49	1,100	*84 J*	590	440	460	4,900	6.7	120	7.1	10	1,300	1,600	1,400	9,200	7,200		100	*3.3 J*	*30,000*	**150,000**
PFHpA	7		33	53	110	200	180	6.0	*1.6 J*	200	200	75	220	25	450	310	230	310	33	68	220	200	250	250	8.1	370		220	310	340	2,000	*1.9 J*	38		*2.80 J*	400	290	310	1,500	1,400		46		NRS	NRS
PFOA	8	*1.1 J*	**180**	**140**	**1,700**	**1,000**	**280**	**37**	*5.7*	**440**	**760**	**400**	**1,200**	**47**	**970**	**1,200**	**390**	**740**	**800**	**710**	**350**	**370**	**540**	**1,200**	**260**	**1,300**	**180**	**540**	**490**	**390**	**4,400**	**7.6**	**450**	**7.0**	**20**	**6,200**	**1,000**	**3,400**	**7,500**	**16,000**	*3.6*	**50**	**5.3**	*2* C1	**20** C1
PFNA	9		*4.6 J*		*1.8 J*	*29*	**33**	*1.3 J*		*8.6*	*18*	*6.5*	**30**	*2.7 J*	*8.7*	*9.8*	*4.60 J*	*5.2*	*18*	*7.0*	*4.8 J*	*4.40 J*	*6.8*	**37**		*22*		*17*	*38*	*27*	**51**					**140**	**42**	**99**	**98**	**420**			*2.4 J*	*3*	**30**
PFDA	10							*1.8 J*	*1.50 J*	*3.9 J*				*2.4 J*	*4.6 J*	*1.6 J*		*4.30 J*				*1.50 J*	*4.40 J*	*5.7*		*2.8 J*		*6.8*	*22*	*12*	*14*					*12*	*14*	*30*	*12*	*200*				*60*	**300**
PFUnA	11																												*3.0 J*	*4.9*														*600*	**3,000**
PFDoA	12																																				*1.10 J*							100	500
Sulfonic Acids																																												
PFBS	4	*3.7 J*	170	100	280	430	650	41	*1.5 J*	260	370	290	610	43	400	550	240	300	110	180	270	250	250	190	23	440	*20 J*	190	250	230	1,800	8.8	230	6.9	*62*	2,800	3,200	1,600	20,000	17,000	*3.70 J*	140	*2.6 J*	*90,000*	**450,000**
PFPeS	5		15	22	130	360	75	26		33	*7.2*	60	160	*3.8 J*	75	80	*22*	56	18	42	25	20	38	15	7.9	62		27	59	57	170		9.6	*0.58 J*	*0.84 J*	1,200	1,000	930	1,000	1,000		3.0 J		NRS	NRS
PFHxS	6		**73**	**57**	**240**	**1,300**	**170**	*33*	*1.9 J*	**170**	**350**	**200**	**480**	*18*	**290**	**220**	**110**	**230**	**180**	**220**	**110**	**93**	**160**	**120**	**210**	**360**	**67 J**	**160**	**440**	**280**	**1,000**	*4.9*	**200**	*5.1*	*6.20 J*	**6,000**	**2,600**	**4,200**	**1,800**	**3,200**	*2.00 J*	*9.2 J*		*4*	**40**
PFHpS	7		*1.6 J*		*2.7 J*	*21 J*	*3.7 J*			13	25	*26*	25	*2.8 J*	*7.5*	13	10	*6.6*	*120*	36	*6.3*	*7.7*	*9.6*	*26*	*8.2*	19		15	*28*	*17*	*71*	*2.1 J*	*12*	*1.8 J*		1,100	200	1,200	420	1,300		*2.8 J*		NRS	NRS
PFOS	8		**24**		**3.5**	**130**	**60**	**28**	*13*	**560**	**330**	**210**	**950**	**240**	**1,300**	**540**	**270**	**850**	**1,700**	**280**	**230**	**300**	**340**	**840**	**42**	**830**	**510**	**1,900**	**2,500**	**1,400**	**4,100**	**47**	**160**	**58**	**46**	**17,000**	**12,000**	**15,000**	**12,000**	**71,000**	*6.8*	**560**	**15**	*2* C1	**20** C1
PFNS	9									*2.5 J*				*1.2 J*	*1.7 J*			*1.10 J*					*1.50 J*	*1.00 J*			*3.4*	*8.5*	*4.8 J*	*0.53 J*					*31*	*1.2 J*	*48*	*6.50 J*	*31*				NRS	NRS
PFDS	10													*2.2 J*			*1.50 J*					*1.60 J*						*2.4 J*								*1.80 J*	*5*	*1.90 J*		*2.90 J*				NRS	NRS
PFDoS	12																																											NRS	NRS
4:2 FTS	6				*3.5 J*								*1.3 J*		*4.3 J*	*2.4 J*		*1.40 J*			*1.1 J*		*1.00 J*	*1.40 J*		*1.1 J*				*0.95 J*	*7.1*							*5.90 J*	*11*				NRS	NRS
6:2 FTS	8				190	400		*2.6 J*	*2.3 J*	47	330	19	73	58	190	110	67	170	13	26	31	59	96	480		190	510	120	39	95	330		14			230	130	250	230	610				NRS	NRS
8:2 FTS	10									*1.2 J*			*7.0*	*1.7 J*	*86*	*5.8 J*		*13*			*1.4 J*		*4.90 J*	*35*		*12*			*10*	*25*	*15*	*35*		*1.6 J*			*24*	*62*	*57*						NRS	NRS
Sulfonamides, Sulfomodioacetic Acids, Sulfonamidoethanols																																												
PFOSA	9								*2.1 J*				**32**		**78**	**83**	**24**	*13*	*0.98 J*	*3.90 J*	*0.96 J*	**26**	*15*	*1.2 J*	*5.00 J*		*7.9*	**530**	**96.0**	**110**	**100**	**9.1**					*4.40 J*	**980**	*1.7*	**1.400**	**9.10 J**				*2* C2	**20** C2
NMeFOSA	9																*2.40 J*					*4.8*						*70 J*									*6.7*		*2.00 J*						*NRS*	**NRS**
NEtFOSA	10	*1.3 J*	*1.5 J*																									**240 J**		*1.9 J*	*1.3 J*							**180**		**40**					*2* C2	**20** C2
NMeFOSAA	11								*1.2 J*	*5.6*			*0.77 J*	*4.8 J*	*16*	*2.9 J*	*17*	*16*			*5.9*	*4.70 J*	*11*	*1.60 J*		*3.9 J*		*28 J*	*68*	*47*	*6.3*		*6.9*			*1.00 J*	*110*	*3.10 J*	*13*	*8.10 J*				NRS	NRS
NEtFOSAA	12						*16*	*1.5 J*	*1.0 J*		**4.7 J**		**33**	**3.6 J**	**3.6 J**		*5.9*	*3.20 J*	*5.20 J*			*2.90 J*				*7.3*	**470**	**76**	**130**	**110**	**35**					*3.20 J*	**15,000**		**2.100**	**190**				*2* C2	**20** C2
NEtFOSE	12																										**1,900**																*2* C2	**20** C2
NMeFOSE	11																														47						170							*NRS*	**NRS**
Replacement Chemicals																																												
HFPO-DA	6					1.5 J		2.8 J		4.3 J			1.8 J								2.3 J					1.5 J				2.1 J	3.1 J					2.70 J	2.1 J	2.00 J	21	23				*30*	**300**
DONA	7																																						3.7 J					600	3,000

NOTES:
PFAS concentrations in nanograms per liter (ng/l) equivalent to parts per trillion (ppt).
All samples were analyzed for PFAS using Method ES37 Modified; only compounds detected in one or more samples are shown in this table. Wells W-3A & W-3B did not contain any PFAS and therefore are not included in this table.
C1 = The WDNR proposed an ES and PAL of 20 ng/l and 2 ng/l, respectively, for PFOA and PFOS, separately and combined, as part of its proposed 9/15/23 revisions to the NR 140 Code.
C2 = DHS recommended a combined ES of 20 ng/l and a combined PAL of 2 ng/l for PFOSA, NEtFOSA, NEtFOSAA, and NEtFOSE as part of Cycle 11 recommended revisions to the NR 140 Code (Nov. 2020).
Detected concentrations at or above a recommended NR 140 PAL are *italicized*; those at or above a recommended NR 140 ES are **bold**.
Compounds with combined recommended NR 140 ES and PALs are underlined. If the sum of the compounds with a combined recommended is above the recommended PAL or ES, then both compounds are underlined and either *italicized* or in **bold**, respectively, even if one or more compounds are below Wisconsin Department of Health Service recommended NR 140 enforcement standards (ES) and preventative action limit (PAL) as part of Cycle 11 recommended revisions to the NR 140 Code.
J flag denotes concentration above its method detection limit (MDL) but below the method quantification limit (MQL).
NRS = No recommended standard yet from Cycle 11.
C# – number of carbon atoms in compound.





ENGINEER

NO	REVISION NOTES	DATE	REVIEWED

DRAWN: JSD
DESIGNED: AWM
APPROVED: AWM
SCALE: AS NOTED
JOB No.: 55929.007
DATE: NOV. 2024

GANNETT FLEMING
HARRISBURG, PENNSYLVANIA MADISON, WISCONSIN

PROJECT
WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TITLE
CROSS SECTION E-E' WITH ESTIMATED VERTICAL EXTENT OF PFAS DECEMBER 2023 - JUNE 2024

DRAWING No.
4

CHECKED BY XXX ON XX/XX/24
11X17
2024_55929-007_sect_PNV_004

ATTACHMENT C

ANALYTICAL METHODS WITH LIST OF COMPOUNDS AND METHOD DETECTION LIMITS

GANNETT FLEMING

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_537MOD_S
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 13-Jul-23

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	0.2366	1
A	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	812-70-4	0.4435	1
A	2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	356-02-5	0.2845	1
A	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	914637-49-3	0.2343	1
A	4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	0.5954	1
A	9Cl-PF3ONS	756426-58-1	0.1439	1
A	Fluorotelomer Sulphonic Acid 10:2 (FtS 10:2)	120226-60-0	0.3205	1
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	0.2877	1
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	0.2781	1
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	0.5211	1
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	0.3492	1
A	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	0.9436	1
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	0.6367	1
A	N-Ethylperfluorooctanesulfonamidoethanol	1691-99-2	0.2399	1
A	N-methylperfluoro-1-octanesulfonamide	31506-32-8	0.2833	1
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	0.6464	1
A	N-Methylperfluorooctanesulfonamidoethanol	24448-09-7	0.6718	1
A	Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	133201-07-7	0.0848	1
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	0.1217	1
A	Perfluorobutanoic Acid (PFBA)	375-22-4	0.2706	1
A	Perfluorobutylsulfonamide (PFBSA)	30334-69-1	0.5627	1
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	0.5626	1
A	Perfluorodecanoic Acid (PFDA)	335-76-2	0.164	1
A	Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	0.253	1
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	0.3108	1
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	0.5345	1
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	0.2293	1
A	Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	0.1507	1
A	Perfluorohexanesulfonamide (PFHxSA)	41997-13-1	0.2138	1
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	0.2123	1
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	0.1504	1
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	0.1671	1
A	Perfluorononanoic Acid (PFNA)	375-95-1	0.1452	1
A	Perfluorooctadecanoic Acid (PFODA)	16517-11-6	0.2119	1
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	0.2379	1
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.1918	1
A	Perfluorooctanoic Acid (PFOA)	335-67-1	0.1657	1
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	0.4164	1

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_537MOD_S
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 13-Jul-23

Type	Analyte	CAS	MDL	PQL
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	0.1176	1
A	Perfluorotetradecanoic Acid (PFTeA)	376-06-7	0.2165	1
A	Perfluorotridecanoic Acid (PFTriA)	72629-94-8	0.6559	1
A	Perfluoroundecanoic Acid (PFUnA)	2058-94-8	0.3031	1
I	13C2-FtS 10:2 IS	13C-10_2-FTS_IS	0	0
I	13C2-FtS 4:2 IS	13C-4_2-FTS_IS	0	0
I	13C2-FtS 6:2 IS	13C2-6_2-FTS_IS	0	0
I	13C2-FtS 8:2 IS	13C-8_2-FTS_IS	0	0
I	13C2-PFDA IS	13C-PFDA_IS	0	0
I	13C2-PFDoA IS	13C-PFDoA_IS	0	0
I	13C2-PFHxA IS	13C-PFHxA_IS	0	0
I	13C2-PFHxDA IS	13C2-PFHxDA_IS	0	0
I	13C2-PFTeA IS	13C-PFTeDA_IS	0	0
I	13C2-PFUnA IS	13C-PFUnDA_IS	0	0
I	13C3-HFPO-DA IS	13C_HFPO_DA_IS	0	0
I	13C3-PFBS IS	13C-PFBS_IS	0	0
I	13C4-PFBA IS	13C-PFBA_IS	0	0
I	13C4-PFHpA IS	13C-PFHpA_IS	0	0
I	13C4-PFOA IS	13C-PFOA_IS	0	0
I	13C4-PFOS IS	13C-PFOS_IS	0	0
I	13C5-PFNA IS	13C-PFNA_IS	0	0
I	13C5-PFPeA IS	13C-PFPeA_IS	0	0
I	13C7-PFUnDA IS	13C7-PFUnDA	0	0
I	13C8-FOSA IS	13C-FOSA_IS	0	0
I	18O2-PFHxS IS	18O-PFHxS_IS	0	0
I	d3-N-MeFOSA IS	d3-NMeFOSA_IS	0	0
I	d3-N-MeFOSAA IS	d3-N-MeFOSAA_IS	0	0
I	d5-N-EtFOSA IS	d5-NEtFOSA_IS	0	0
I	d5-N-EtFOSAA IS	d5-N-EtFOSAA_IS	0	0
I	d7-N-MeFOSE IS	d7-N-MeFOSE_IS	0	0
I	d9-N-EtFOSE IS	D9-EtFOSE_IS	0	0
S	13C2-FtS 10:2	M2-10-2FTS	0	0
S	13C2-FtS 4:2	PAMN-1492	0	0
S	13C2-FtS 6:2	M2-6-2FTS	0	0
S	13C2-FtS 8:2	M2-8-2FTS	0	0
S	13C2-PFDA	STL00996	0	0
S	13C2-PFDoA	STL00998	0	0
S	13C2-PFHxA	STL00993	0	0

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_537MOD_S
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 13-Jul-23

Type	Analyte	CAS	MDL	PQL
S	13C2-PFHxDA	Perfluorohexadecanoic acid (13C2-PFHxDA)	0	0
S	13C2-PFTeA	13C2-PFTeA	0	0
S	13C2-PFUnA	STL00997	0	0
S	13C3-HFPO-DA	STL02255	0	0
S	13C3-PFBS	STL02337	0	0
S	13C4-PFBA	STL00992	0	0
S	13C4-PFHpA	STL01892	0	0
S	13C4-PFOA	STL00990	0	0
S	13C4-PFOS	PAMN-1458	0	0
S	13C5-PFNA	STL00995	0	0
S	13C5-PFPeA	STL01893	0	0
S	13C8-FOSA	STL01056	0	0
S	18O2-PFHxS	STL00994	0	0
S	d3-N-MeFOSA	d3-N-MeFOSA	0	0
S	d3-N-MeFOSAA	PAMN-1460	0	0
S	d5-N-EtFOSA	STL02117	0	0
S	d5-N-EtFOSAA	d5-N-EtFOSAA	0	0
S	d7-N-MeFOSE	d7-N-MeFOSE	0	0
S	d9-N-EtFOSE	d9-N-EtFOSE	0	0

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_537MOD_W
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 02-Oct-24

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	0.467	5
A	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	812-70-4	1.08	5
A	2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	356-02-5	3.02	5
A	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	914637-49-3	1.39	5
A	4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	0.562	5
A	9Cl-PF3ONS	756426-58-1	0.448	5
A	Fluorotelomer Sulphonic Acid 10:2 (FtS 10:2)	120226-60-0	2.35	5
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	0.9364	5
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	1.92	5
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	1.13	5
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	1.17	5
A	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	1.15	5
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	1.545	5
A	N-Ethylperfluorooctanesulfonamidoethanol	1691-99-2	1.049	5
A	N-methylperfluoro-1-octanesulfonamide	31506-32-8	0.793	5
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	0.644	5
A	N-Methylperfluorooctanesulfonamidoethanol	24448-09-7	1.502	5
A	Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	133201-07-7	0.8861	5
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	0.351	5
A	Perfluorobutanoic Acid (PFBA)	375-22-4	2.6	5
A	Perfluorobutylsulfonamide (PFBSA)	30334-69-1	1.985	5
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	1.37	5
A	Perfluorodecanoic Acid (PFDA)	335-76-2	1.24	5
A	Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	0.6225	5
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	0.691	5
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	0.566	5
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	1.73	5
A	Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	1.8	5
A	Perfluorohexanesulfonamide (PFHxSA)	41997-13-1	0.8782	5
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	0.9029	5
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	1.2	5
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	0.496	5
A	Perfluorononanoic Acid (PFNA)	375-95-1	0.87	5
A	Perfluorooctadecanoic Acid (PFODA)	16517-11-6	0.649	5
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	0.711	5
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.892	2
A	Perfluorooctanoic Acid (PFOA)	335-67-1	0.6302	2
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	0.556	5

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_537MOD_W
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 02-Oct-24

Type	Analyte	CAS	MDL	PQL
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	1.28	5
A	Perfluorotetradecanoic Acid (PFTeA)	376-06-7	2.64	5
A	Perfluorotridecanoic Acid (PFTriA)	72629-94-8	1.931	5
A	Perfluoroundecanoic Acid (PFUnA)	2058-94-8	0.9744	5
I	13C2-FtS 10:2 IS	13C-10_2-FTS_IS	0	0
I	13C2-FtS 4:2 IS	13C-4_2-FTS_IS	0	0
I	13C2-FtS 6:2 IS	13C2-6_2-FTS_IS	0	0
I	13C2-FtS 8:2 IS	13C-8_2-FTS_IS	0	0
I	13C2-PFDA IS	13C-PFDA_IS	0	0
I	13C2-PFDoA IS	13C-PFDoA_IS	0	0
I	13C2-PFHxA IS	13C-PFHxA_IS	0	0
I	13C2-PFHxDA IS	13C2-PFHxDA_IS	0	0
I	13C2-PFTeA IS	13C-PFTeDA_IS	0	0
I	13C2-PFUnA IS	13C-PFUnDA_IS	0	0
I	13C3-HFPO-DA IS	13C_HFPO_DA_IS	0	0
I	13C3-PFBS IS	13C-PFBS_IS	0	0
I	13C4-PFBA IS	13C-PFBA_IS	0	0
I	13C4-PFHpA IS	13C-PFHpA_IS	0	0
I	13C4-PFOA IS	13C-PFOA_IS	0	0
I	13C4-PFOS IS	13C-PFOS_IS	0	0
I	13C5-PFNA IS	13C-PFNA_IS	0	0
I	13C5-PFPeA IS	13C-PFPeA_IS	0	0
I	13C7-PFUnDA IS	13C7-PFUnDA	0	0
I	13C8-FOSA IS	13C-FOSA_IS	0	0
I	18O2-PFHxS IS	18O-PFHxS_IS	0	0
I	d3-N-MeFOSA IS	d3-NMeFOSA_IS	0	0
I	d3-N-MeFOSAA IS	d3-N-MeFOSAA_IS	0	0
I	d5-N-EtFOSA IS	d5-NEtFOSA_IS	0	0
I	d5-N-EtFOSAA IS	d5-N-EtFOSAA_IS	0	0
I	d7-N-MeFOSE IS	d7-N-MeFOSE_IS	0	0
I	d9-N-EtFOSE IS	D9-EtFOSE_IS	0	0
S	13C2-FtS 10:2	M2-10-2FTS	0	0
S	13C2-FtS 4:2	PAMN-1492	0	0
S	13C2-FtS 6:2	M2-6-2FTS	0	0
S	13C2-FtS 8:2	M2-8-2FTS	0	0
S	13C2-PFDA	STL00996	0	0
S	13C2-PFDoA	STL00998	0	0
S	13C2-PFHxA	STL00993	0	0

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_537MOD_W
Test Number: E537 Mod
Test Name: PFAS by EPA 537 Modified
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 02-Oct-24

Type	Analyte	CAS	MDL	PQL
S	13C2-PFHxDA	Perfluorohexadecanoic acid (13C2-PFHxDA)	0	0
S	13C2-PFTeA	13C2-PFTeA	0	0
S	13C2-PFUnA	STL00997	0	0
S	13C3-HFPO-DA	STL02255	0	0
S	13C3-PFBS	STL02337	0	0
S	13C4-PFBA	STL00992	0	0
S	13C4-PFHpA	STL01892	0	0
S	13C4-PFOA	STL00990	0	0
S	13C4-PFOS	PAMN-1458	0	0
S	13C5-PFNA	STL00995	0	0
S	13C5-PFPeA	STL01893	0	0
S	13C8-FOSA	STL01056	0	0
S	18O2-PFHxS	STL00994	0	0
S	d3-N-MeFOSA	d3-N-MeFOSA	0	0
S	d3-N-MeFOSAA	PAMN-1460	0	0
S	d5-N-EtFOSA	STL02117	0	0
S	d5-N-EtFOSAA	d5-N-EtFOSAA	0	0
S	d7-N-MeFOSE	d7-N-MeFOSE	0	0
S	d9-N-EtFOSE	d9-N-EtFOSE	0	0

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_1633_S
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 23-May-24

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	0.206	0.5
A	2H,2H,3H,3H-Perfluorooctanoic acid (FTCA 5:3)	914637-49-3	2.169	10
A	3-Perfluoroheptyl propanoic acid (FTCA 7:3)	812-70-4	2.169	10
A	3-Perfluoropropyl propanoic acid (FTCA 3:3)	356-02-5	4.391	10
A	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	919005-14-4	0.129	0.5
A	9Cl-PF3ONS	756426-58-1	0.166	0.5
A	Fluorotelomer Sulphonic Acid 10:2 (FtS 10:2)	120226-60-0	0.114	0.5
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	0.101	0.5
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	0.173	0.5
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	0.136	0.5
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	0.22	0.5
A	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	0.158	0.5
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	0.403	0.5
A	N-Ethylperfluorooctanesulfonamidoethanol	1691-99-2	0.17	0.5
A	N-methylperfluoro-1-octanesulfonamide	31506-32-8	0.148	0.5
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	0.184	0.5
A	N-Methylperfluorooctanesulfonamidoethanol	24448-09-7	0.199	0.5
A	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	0.182	0.5
A	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	0.152	0.5
A	Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	0.206	0.5
A	Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	133201-07-7	0.167	0.5
A	Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	0.2	0.5
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	0.096	0.5
A	Perfluorobutanoic Acid (PFBA)	375-22-4	0.048	0.5
A	Perfluorobutylsulfonamide (PFBSA)	30334-69-1	0.11	0.5
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	0.117	0.5
A	Perfluorodecanoic Acid (PFDA)	335-76-2	0.163	0.5
A	Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	0.156	0.5
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	0.066	0.5
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	0.121	0.5
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	0.177	0.5
A	Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	0.13	0.5
A	Perfluorohexanesulfonamide (PFHxSA)	41997-13-1	0.112	0.5
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	0.067	0.5
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	0.133	0.5
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	0.149	0.5
A	Perfluorononanoic Acid (PFNA)	375-95-1	0.092	0.5
A	Perfluorooctadecanoic Acid (PFODA)	16517-11-6	0.232	0.5

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_1633_S
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 23-May-24

Type	Analyte	CAS	MDL	PQL
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	0.15	0.5
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.183	0.5
A	Perfluorooctanoic Acid (PFOA)	335-67-1	0.101	0.5
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	0.11	0.5
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	0.094	0.5
A	Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	0.127	0.5
A	Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	0.083	0.5
A	Perfluoroundecanoic Acid (PFUnDA)	2058-94-8	0.134	0.5
I	13C2-PFDA IS	13C-PFDA_IS	0	0
I	13C2-PFHxA IS	13C-PFHxA_IS	0	0
I	13C3-PFBA IS	13C3-PFBA_IS	0	0
I	13C4-PFOA IS	13C-PFOA_IS	0	0
I	13C4-PFOS IS	13C-PFOS_IS	0	0
I	13C5-PFNA IS	13C-PFNA_IS	0	0
I	18O2-PFHxS IS	18O-PFHxS_IS	0	0
S	13C2-FtS 10:2	M2-10-2FTS	0	0
S	13C2-FtS 4:2	PAMN-1492	0	0
S	13C2-FtS 6:2	M2-6-2FTS	0	0
S	13C2-FtS 8:2	M2-8-2FTS	0	0
S	13C2-PFDoA	STL00998	0	0
S	13C2-PFHxDA	Perfluorohexadecanoic acid (13C2-PFHxDA)	0	0
S	13C2-PFTeDA	13C2-PFTeA	0	0
S	13C3-HFPO-DA	STL02255	0	0
S	13C3-PFBS	STL02337	0	0
S	13C3-PFHxS	13C3-PFHxS	0	0
S	13C4-PFBA	STL00992	0	0
S	13C4-PFHpA	STL01892	0	0
S	13C5-PFHxA	13C5PFHxA	0	0
S	13C5-PFPeA	STL01893	0	0
S	13C6-PFDA	13C6-PFDA	0	0
S	13C7-PFUnDA	13C7-PFUnDA	0	0
S	13C8-PFOA	13C8-PFOA	0	0
S	13C8-PFOS	13C8-PFOS	0	0
S	13C8-PFOSA	STL01056	0	0
S	13C9-PFNA	13C9-PFNA	0	0
S	d3-N-MeFOSA	d3-N-MeFOSA	0	0
S	d3-N-MeFOSAA	PAMN-1460	0	0

ALS Group, USA

Date: 03-Jan-25

Test Code: LCMS_1633_S
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 23-May-24

Type	Analyte	CAS	MDL	PQL
S	d5-N-EtFOSA	STL02117	0	0
S	d5-N-EtFOSAA	d5-N-EtFOSAA	0	0
S	d7-N-MeFOSE	d7-N-MeFOSE	0	0
S	d9-N-EtFOSE	d9-N-EtFOSE	0	0

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_1633_W
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 14-Mar-24

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	0.5686	1
A	2H,2H,3H,3H-Perfluorooctanoic acid (FTCA 5:3)	914637-49-3	3.563	20
A	3-Perfluoroheptyl propanoic acid (FTCA 7:3)	812-70-4	34.97	100
A	3-Perfluoropropyl propanoic acid (FTCA 3:3)	356-02-5	3.563	20
A	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	919005-14-4	0.2632	2
A	9Cl-PF3ONS	756426-58-1	1.683	2
A	Fluorotelomer Sulphonic Acid 10:2 (FtS 10:2)	120226-60-0	1.024	2
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	0.2152	1
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	0.5979	2
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	0.4227	2
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	0.5429	2
A	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	0.1975	1
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	0.7879	2
A	N-Ethylperfluorooctanesulfonamidoethanol	1691-99-2	1.174	2
A	N-methylperfluoro-1-octanesulfonamide	31506-32-8	0.902	2
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	0.7193	2
A	N-Methylperfluorooctanesulfonamidoethanol	24448-09-7	0.5268	2
A	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	0.9046	2
A	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	1.102	2
A	Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	0.3691	1
A	Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	133201-07-7	0.5039	1
A	Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	0.5981	1
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	0.2792	1
A	Perfluorobutanoic Acid (PFBA)	375-22-4	1.903	2
A	Perfluorobutylsulfonamide (PFBSA)	30334-69-1	0.4957	1
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	0.5762	1
A	Perfluorodecanoic Acid (PFDA)	335-76-2	0.572	1
A	Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	0.7909	2
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	0.798	2
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	0.5517	1
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	0.486	1
A	Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	1.129	2
A	Perfluorohexanesulfonamide (PFHxSA)	41997-13-1	1.033	2
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	0.554	2
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	1.058	2
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	0.512	1
A	Perfluorononanoic Acid (PFNA)	375-95-1	0.432	1
A	Perfluorooctadecanoic Acid (PFODA)	16517-11-6	1.236	2

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_1633_W
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 14-Mar-24

Type	Analyte	CAS	MDL	PQL
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	0.4724	2
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	1.181	2
A	Perfluorooctanoic Acid (PFOA)	335-67-1	0.4	1
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	0.4346	1
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	0.696	1
A	Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	1.02	2
A	Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	0.866	2
A	Perfluoroundecanoic Acid (PFUnDA)	2058-94-8	0.788	2
I	13C2-PFDA IS	13C-PFDA_IS	0	0
I	13C2-PFHxA IS	13C-PFHxA_IS	0	0
I	13C3-PFBA IS	13C3-PFBA_IS	0	0
I	13C4-PFOA IS	13C-PFOA_IS	0	0
I	13C4-PFOS IS	13C-PFOS_IS	0	0
I	13C5-PFNA IS	13C-PFNA_IS	0	0
I	18O2-PFHxS IS	18O-PFHxS_IS	0	0
S	13C2-FtS 10:2	M2-10-2FTS	0	0
S	13C2-FtS 4:2	PAMN-1492	0	0
S	13C2-FtS 6:2	M2-6-2FTS	0	0
S	13C2-FtS 8:2	M2-8-2FTS	0	0
S	13C2-PFDoA	STL00998	0	0
S	13C2-PFHxDA	Perfluorohexadecanoic acid (13C2-PFHxDA)	0	0
S	13C2-PFTeDA	13C2-PFTeA	0	0
S	13C3-HFPO-DA	STL02255	0	0
S	13C3-PFBS	STL02337	0	0
S	13C3-PFHxS	13C3-PFHxS	0	0
S	13C4-PFBA	STL00992	0	0
S	13C4-PFHpA	STL01892	0	0
S	13C5-PFHxA	13C5PFHxA	0	0
S	13C5-PFPeA	STL01893	0	0
S	13C6-PFDA	13C6-PFDA	0	0
S	13C7-PFUnDA	13C7-PFUnDA	0	0
S	13C8-PFOA	13C8-PFOA	0	0
S	13C8-PFOS	13C8-PFOS	0	0
S	13C8-PFOSA	STL01056	0	0
S	13C9-PFNA	13C9-PFNA	0	0
S	d3-N-MeFOSA	d3-N-MeFOSA	0	0
S	d3-N-MeFOSAA	PAMN-1460	0	0

ALS Group, USA

Date: 02-Dec-24

Test Code: LCMS_1633_W
Test Number: E1633
Test Name: PFAS by EPA 1633
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 14-Mar-24

Type	Analyte	CAS	MDL	PQL
S	d5-N-EtFOSA	STL02117	0	0
S	d5-N-EtFOSAA	d5-N-EtFOSAA	0	0
S	d7-N-MeFOSE	d7-N-MeFOSE	0	0
S	d9-N-EtFOSE	d9-N-EtFOSE	0	0

ALS Group, USA

Date: 17-Jan-25

Test Code: LCMS_8327_S
Test Number: SW8327
Test Name: PFAS by LC-MS-MS
Matrix: Soil **Units:** ng/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 13-Jul-23

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	10.24	25
A	4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	13.38	25
A	9Cl-PF3ONS	756426-58-1	14.89	25
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	80.84	125
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	47.51	125
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	59.26	125
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	57.13	125
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	49.45	125
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	74.16	125
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	16.8	25
A	Perfluorobutanoic Acid (PFBA)	375-22-4	42.27	125
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	13.07	25
A	Perfluorodecanoic Acid (PFDA)	335-76-2	45.44	125
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	26.28	125
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	67.72	125
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	37.98	125
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	63.9	125
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	50.98	125
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	21.69	125
A	Perfluorononanoic Acid (PFNA)	375-95-1	12.53	25
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	8.483	25
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	22.87	25
A	Perfluorooctanoic Acid (PFOA)	335-67-1	11.26	25
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	13.75	25
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	39.67	125
A	Perfluorotetradecanoic Acid (PFTeA)	376-06-7	81.45	125
A	Perfluorotridecanoic Acid (PFTriA)	72629-94-8	70.4	125
A	Perfluoroundecanoic Acid (PFUnA)	2058-94-8	50.19	125
S	13C2-FtS 4:2	757124-72-413C2	0	0
S	13C2-FtS 6:2	27619-97-213C2	0	0
S	13C2-FtS 8:2	39108-34-413C2	0	0
S	13C2-PFDA	13C2-PFDA	0	0
S	13C2-PFDoA	307-55-113C2	0	0
S	13C2-PFHxA	CASID39197	0	0
S	13C2-PFTeA	376-06-713C2	0	0
S	13C2-PFUnA	2058-94-813C2	0	0
S	13C3-HFPO-DA	13C3-HFPO-DA	0	0
S	13C3-PFBS	13C3-PFBS	0	0

ALS Group, USA

Date: 17-Jan-25

Test Code: LCMS_8327_S
Test Number: SW8327
Test Name: PFAS by LC-MS-MS
Matrix: Soil **Units:** ng/Kg

METHOD DETECTION / REPORTING LIMITS

Updated: 13-Jul-23

Type	Analyte	CAS	MDL	PQL
S	13C4-PFBA	375-22-413C4	0	0
S	13C4-PFHpA	13C4-PFHpA	0	0
S	13C4-PFOA	FLOCT13C4	0	0
S	13C4-PFOS	13C4-PFOS	0	0
S	13C5-PFNA	CASID39198	0	0
S	13C5-PFPeA	2706-90-313C5	0	0
S	13C8-FOSA	1763-23-113C8	0	0
S	18O2-PFHxS	18O2-PFHxS	0	0
S	d3-N-MeFOSAA	d3N-MeFOSAA	0	0
S	d5-N-EtFOSAA	d5EtFOSAA	0	0

ALS Group, USA

Date: 17-Jan-25

Test Code: LCMS_8327_W
Test Number: SW8327
Test Name: PFAS by LC-MS-MS
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 08-Feb-24

Type	Analyte	CAS	MDL	PQL
A	11Cl-Pf3OUdS	763051-92-9	8.82	10
A	4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	919005-14-4	7.48	10
A	9Cl-PF3ONS	756426-58-1	3.045	10
A	Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	757124-72-4	37.08	50
A	Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	27619-97-2	19.74	50
A	Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	39108-34-4	27.42	50
A	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	39.16	50
A	N-Ethylperfluorooctanesulfonamidoacetic Acid	2991-50-6	26.98	50
A	N-Methylperfluorooctanesulfonamidoacetic Acid	2355-31-9	21.1	50
A	Perfluorobutanesulfonic Acid (PFBS)	375-73-5	8.2	10
A	Perfluorobutanoic Acid (PFBA)	375-22-4	14.42	50
A	Perfluorodecanesulfonic Acid (PFDS)	335-77-3	7.408	10
A	Perfluorodecanoic Acid (PFDA)	335-76-2	15.02	50
A	Perfluorododecanoic Acid (PFDoA)	307-55-1	29.68	50
A	Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	10.81	50
A	Perfluoroheptanoic Acid (PFHpA)	375-85-9	15.51	50
A	Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	13.59	50
A	Perfluorohexanoic Acid (PFHxA)	307-24-4	14.29	50
A	Perfluorononanesulfonic Acid (PFNS)	68259-12-1	13.4	50
A	Perfluorononanoic Acid (PFNA)	375-95-1	9.3	10
A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	8.19	10
A	Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	5.069	10
A	Perfluorooctanoic Acid (PFOA)	335-67-1	9.3	10
A	Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	5.32	10
A	Perfluoropentanoic Acid (PFPeA)	2706-90-3	8	50
A	Perfluorotetradecanoic Acid (PFTeA)	376-06-7	37.69	50
A	Perfluorotridecanoic Acid (PFTriA)	72629-94-8	17.76	50
A	Perfluoroundecanoic Acid (PFUnA)	2058-94-8	12.02	50
S	13C2-FtS 4:2	757124-72-413C2	0	0
S	13C2-FtS 6:2	27619-97-213C2	0	0
S	13C2-FtS 8:2	39108-34-413C2	0	0
S	13C2-PFDA	13C2-PFDA	0	0
S	13C2-PFDoA	307-55-113C2	0	0
S	13C2-PFHxA	CASID39197	0	0
S	13C2-PFTeA	376-06-713C2	0	0
S	13C2-PFUnA	2058-94-813C2	0	0
S	13C3-HFPO-DA	13C3-HFPO-DA	0	0
S	13C3-PFBS	13C3-PFBS	0	0

ALS Group, USA

Date: 17-Jan-25

Test Code: LCMS_8327_W
Test Number: SW8327
Test Name: PFAS by LC-MS-MS
Matrix: Water **Units:** ng/L

METHOD DETECTION / REPORTING LIMITS

Updated: 08-Feb-24

Type	Analyte	CAS	MDL	PQL
S	13C4-PFBA	375-22-413C4	0	0
S	13C4-PFHpA	13C4-PFHpA	0	0
S	13C4-PFOA	FLOCT13C4	0	0
S	13C4-PFOS	13C4-PFOS	0	0
S	13C5-PFNA	CASID39198	0	0
S	13C5-PFPeA	2706-90-313C5	0	0
S	13C8-FOSA	1763-23-113C8	0	0
S	18O2-PFHxS	18O2-PFHxS	0	0
S	d3-N-MeFOSAA	d3N-MeFOSAA	0	0
S	d5-N-EtFOSAA	d5EtFOSAA	0	0