



April 17, 2024

MS. DENICE NELSON  
JOHNSON CONTROLS, INC  
5757 N. GREEN BAY AVENUE  
MILWAUKEE, WI 53209

Via Email Only to [denice.karen.nelson@jci.com](mailto:denice.karen.nelson@jci.com)

SUBJECT: Response to *Interim Long Term Monitoring Plan for Groundwater and Surface Water*  
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI  
BRRTS #02-38-580694

Dear Ms. Nelson:

On Mar. 15, 2024, the Wisconsin Department of Natural Resources (DNR) received the *Interim Long Term Monitoring Plan for Groundwater and Surface Water* (the “Interim Monitoring Plan”) for the above-referenced site (the “Site”) that was submitted by Arcadis U.S., Inc. (Arcadis), on behalf of Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco). The Interim Monitoring Plan was accompanied by the fee required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response.

The DNR reviewed the Interim Monitoring Plan and understands that the objective is to start an evaluation of trends in contaminant concentrations at certain groundwater and surface water monitoring locations while JCI/Tyco continues to complete its broader site investigation. As stated in its June 23 and Nov. 17, 2023 letters, the DNR does not agree that the nature, degree and extent of PFAS contamination has been sufficiently characterized along all migration pathways at the Site, and thus JCI/Tyco must conduct additional work to close data gaps to complete the site investigation (Wis. Admin. Code ch. NR 716). Monitoring for trends at locations in and around where contamination has been detected at the Site can commence while the extent of contamination is still being investigated. For this reason, the DNR agrees to JCI/Tyco’s Interim Monitoring Plan. The DNR also agrees to this interim plan knowing that JCI/Tyco intends to update it based on findings from future sampling activities. The DNR recommends a few modifications to the Interim Monitoring Plan herein. While incorporation of these recommendations may not result in a complete site investigation, they may result in further progress in that regard.

## Background

JCI/Tyco is investigating and responding to the discharge of per- and polyfluoroalkyl substances (PFAS) to the environment at the JCI/Tyco Fire Technology Center (FTC), located at 2700 Industrial Parkway South in Marinette, Wisconsin. The discharge occurred as the result of fire suppressant training, testing, research and development of PFAS-containing aqueous film forming foams (AFFF) at the Site starting in the early 1960s.

JCI/Tyco’s site investigation activities for the PFAS contamination have been documented in seven prior reports<sup>1</sup>. Additional work is needed for JCI/Tyco to meet the requirements of Wis. Admin. Code ch. NR 716 for a

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<sup>1</sup> Reports documenting prior progress in the SI include:

- *Site Investigation Report* – Sept. 28, 2018 (Posted to BRRTS Oct. 4, 2018)
- *Data Summary Report* – Mar. 8, 2019 (Posted to BRRTS Mar. 13, 2019)
- *Southern Area Groundwater Evaluation Report* – Mar. 20, 2020 (Posted to BRRTS Apr. 10, 2020)

complete site investigation. On Aug. 24, 2023, JCI/Tyco submitted an Additional Site Investigation Work Plan (SI Work Plan), to which the DNR responded on Nov. 17, 2023. The activities proposed in the SI Work Plan have not been completed to date, but it is the DNR's understanding that the additional field investigation and reporting proposed in the SI Work Plan will be performed by JCI/Tyco in the summer of 2024. Completion of these activities may not result in a complete site investigation, but they are expected to help JCI/Tyco make further progress in that regard.

### **Summary of the Interim Monitoring Plan**

JCI/Tyco's Interim Monitoring Plan outlines a 5-year program for monitoring surface water and groundwater at certain locations around the Site with the following objectives:

- Document the stability and attenuation of site-related PFAS in groundwater.
- Verify that concentrations of site-related PFAS in surface water in Ditches A, C and D are decreasing.
- Establish a final long-term monitoring program at the end of the 5-year period.

The scope of work described in the Interim Monitoring Plan includes:

- Sample surface water semi-annually for PFAS at six locations (two each in Ditches A, C and D).
- Sample groundwater for PFAS at 84 existing monitoring wells and up to 14 new monitoring wells. The sampling frequency is summarized in Table 2 and varies by location.
- Measure water levels annually at eight surface water gauging points and at the 84 existing monitoring wells and up to 14 new monitoring wells noted above.
- Conduct the PFAS sampling and water level measurements concurrent with the monitoring for the groundwater extraction and treatment system (GETS) and the deep bedrock aquifer.
- Abandon the 14 monitoring wells that are south of Rader Road.
- Report out the results and any changes to the Interim Monitoring Program semi-annually in Years 1 and 2 and annually in Years 3,4 and 5, for a total of seven reports. At the conclusion of the 5 years, JCI/Tyco anticipates submitting a final monitoring program for the Site.

### **DNR Review and Recommendations**

The DNR approves the Interim Monitoring Plan with the recommended modifications provided below and with the understanding that this approval does not constitute agreement that JCI/Tyco has defined the extent of contamination along all migration pathways as required under Wis. Admin. Code § NR 716.11. Because the Interim Monitoring Plan is dynamic, JCI/Tyco may add monitoring locations to the plan based on the findings from future site investigation activities.

The DNR requests that JCI/Tyco incorporate the following recommendations into its Interim Monitoring Plan. Incorporation of many of these recommendations, while they may not result in a complete site investigation, may result in further progress in that regard.

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- *Interim Site Investigation Report* – May 15, 2020 (Posted to BRRTS Jun. 5, 2020)
  - *Conceptual Site Model* – May 20, 2020 (Posted to BRRTS Jun. 5, 2020)
  - *Air Pathway Site Investigation Report* – Submitted as App. A to the Site Investigation Work Plan – Feb. 11, 2022
  - *Site Investigation Status Report* – Apr. 3, 2023

Monitoring Well Abandonment: The DNR does *not* recommend abandoning the monitoring wells south of Rader Road at this time. Rather, the DNR recommends including at least three of these monitoring wells in the Interim Monitoring Plan and leaving the others available for sampling or water level measurements for at least the duration of the dynamic 5-year monitoring program. The DNR also recommends adding a monitoring well at the depth where PFAS was detected at vertical aquifer profile (VAP) sampling location VAP-63. The recommended additions are summarized in the **Attachment A Table and Figure**. (If JCI/Tyco chooses not to incorporate this area in the Interim Monitoring Program, the DNR still recommends that the existing monitoring wells *not* be abandoned at this time.)

Monitoring Well Additions: The DNR recommends adding monitoring wells into the Interim Monitoring Plan, which are summarized in the **Attachment A Table and Figure**. This includes two existing bedrock monitoring wells and eight new monitoring wells in addition to the ones recommended above. The DNR also recommends adjusting the location of proposed monitoring well “K,” to be closer to vertical aquifer profile (VAP) sampling point VAP-35 (see **Attachment A Figure**).

Monitoring Well Subtractions: If JCI/Tyco would like to off-set some of the additions recommended above, the DNR has identified three monitoring wells currently included in the Interim Monitoring Plan where PFAS sampling is not necessarily needed (see **Attachment A Table**). These wells could be subtracted from the monitoring program at this time. The DNR also understands that JCI/Tyco may propose subtracting or reducing the sampling frequency at other monitoring wells during the 5-year monitoring period based on its evaluation of the PFAS sampling results.

Groundwater Sampling Frequency: JCI/Tyco proposed 2-years of quarterly sampling to be used in trend analysis for ten monitoring wells. The DNR recommends quarterly sampling used for trend analysis at the additional monitoring wells listed below in. (These additions could be offset by reducing the sampling frequency at other monitoring wells that JCI/Tyco proposed for quarterly sampling, also noted below.)

- Include monitoring wells PZ-28-75 (or new well “n”), PZ-61-11, VAP-73, “E” and “K.”
- Reduce frequency at monitoring wells PZ-26-11, PZ-60-20, PZ-78-74, MW-100-68, “C” and “G.”

Surface Water: Remove surface water sampling point SW-31 (at Ditch C) and add surface water sampling point SW-43 (at Ditch E) to the Interim Monitoring Plan. The reasons for these recommendations are noted below.

- Surface water sampling point SW-30 is also included in the Interim Monitoring Plan for Ditch C, and the PFAS results are similar, and thus redundant, to those for surface water sampling point SW-31.
- Sampling of surface water at Ditch E was not included in the Interim Monitoring Plan. However, because the concentrations of PFAS detected in Ditch E are similar to those detected in Ditch C, inclusion of surface water sampling point SW-43 is warranted to document PFAS trends in Ditch E.

Also, Table 3 and Figure 6 of the Interim Monitoring Plan identify surface water monitoring points SG-A1, SG-23, SG-50 and SG-53 as being part of the GETS monitoring plan. The DNR is not aware of these being part of the monitoring for the GETS. Please verify and update the table and figure, if needed.

Reporting: The DNR requests that JCI/Tyco complete the following when reporting the results for sampling conducted for the Interim Monitoring Plan.

- Include PFAS results for surface water sampling point SW-26 (Ditch A), which is being collected as part of the monitoring of the Ditch A treatment system.

- Include the GETS data collected from similar dates in presentations of the data (e.g., figures to depict the distribution of PFAS in groundwater) or as needed to evaluate the monitoring results.
- Report out on results from bedrock monitoring wells (figures and tables) as a distinct grouping and move PZ-1D and PZ-4D from the reporting for the GETS to reporting for the Interim Monitoring Plan.
- Include fluorotelomer sulfonates (FTSs) in evaluations used to derive conclusions from the data.

### Next Steps

Submit a response to comments within **45 days** of receiving this letter and include a revised Interim Monitoring Plan with the submittal (Wis. Admin. Code § NR 716.17(1)). This response is needed to ensure that the Interim Monitoring Plan on the record for the project reflects JCI/Tyco's intended scope of work and documents the reasons why recommended modifications to the plan, if any, were not incorporated at this time. Unless JCI/Tyco would like to receive another review and response from the DNR on its revised Interim Monitoring Plan, JCI/Tyco does *not* need to include a Wis. Admin. Code ch. NR 749 review fee with its response. JCI/Tyco may begin implementing its Interim Monitoring Plan at any time and does not need to wait for further response from the DNR.

If you have any questions, please contact me at [Alyssa.Sellwood@wisconsin.gov](mailto:Alyssa.Sellwood@wisconsin.gov) or (608) 622-8606.

Sincerely,



Alyssa Sellwood, PE  
Water Resources Engineer  
Remediation & Redevelopment Program

Attachments: Attachment A Table – DNR Recommended Additions to the Interim Monitoring Plan  
Attachment A Figure – Copy of Figure 10 from JCI/Tyco's Apr. 2023 SI Status Report with Proposed and Recommended New Well Locations Identified

cc: Jodie Thistle, DNR (via email: [Jodie.Thistle@wisconsin.gov](mailto:Jodie.Thistle@wisconsin.gov))

**Attachment A Table  
DNR Recommended Modifications to the Interim Monitoring Plan**

**Additional Monitoring (Outside of the Area included in Interim Monitoring Plan)**

Monitoring Well ID	Existing	New	Notes
“u”		x	Monitoring well at VAP-63 (37-39)
PZ-37-12 (or PZ-36-19)	x		Groundwater flow path from losing section of Ditch A
PZ-37-29	x		Groundwater flow path from losing section of Ditch A
PZ-41-17	x		Further evaluate cause and significance of PFAS

**Additional Bedrock Monitoring Wells**

Monitoring Well ID	Existing	New	Notes
PZ-64-67	x		Not included in GETS monitoring plan
MW003D	x		Last monitoring point before Menominee River
“m”		x	Concentration and stability at FTC property boundary
“n”		x	Look for connecting flow pathway to Stanton Street

**Additional Overburden Monitoring Wells**

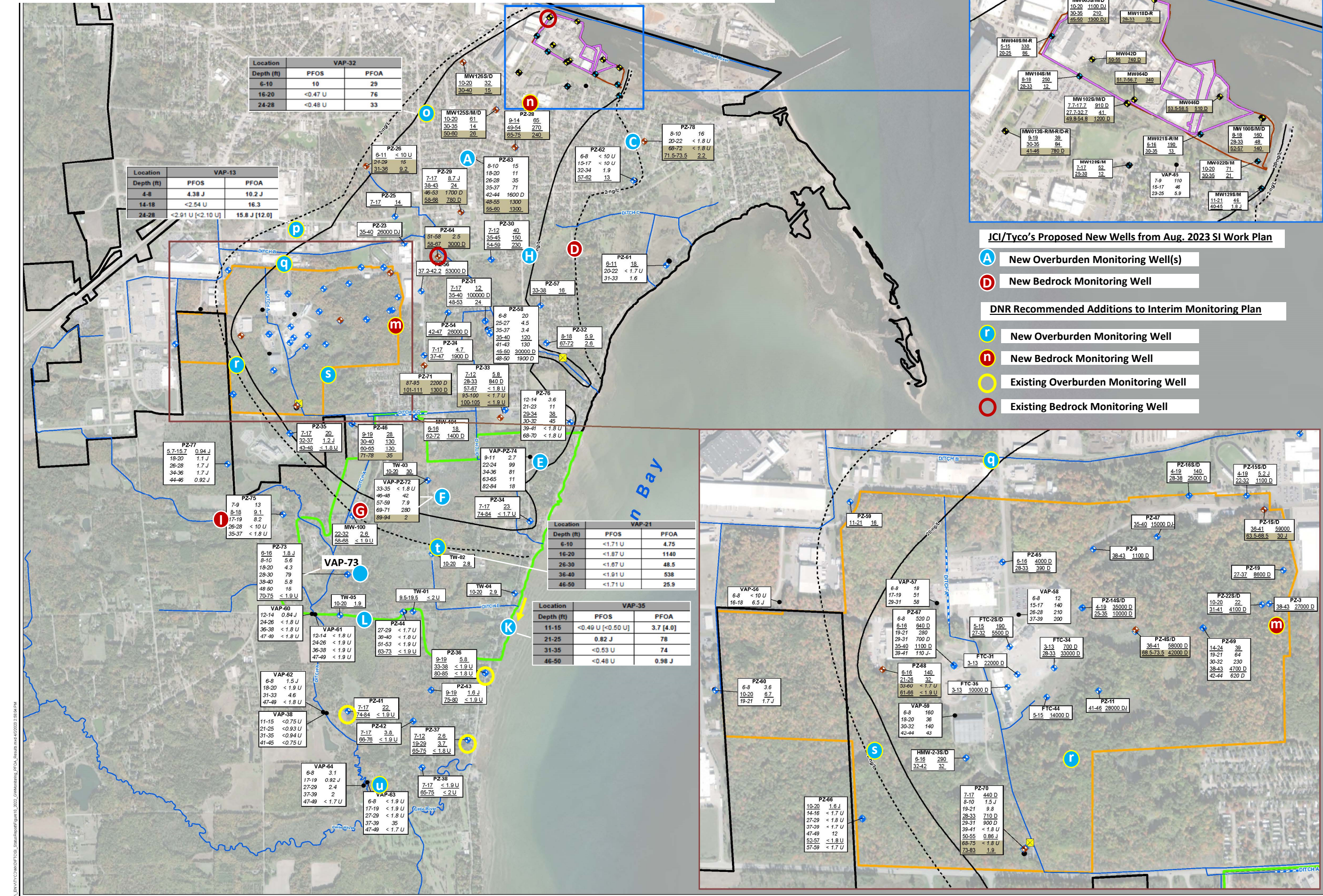
Monitoring Well ID	Existing	New	Notes
“o”		x	Stability at drawn boundary, see VAP-32 (16-20)
“p”		x	Stability at drawn boundary, see VAP-13 (4-16)
“q”		x	Stability at drawn boundary, b/w VAP-65 and Ditch B
“r”		x	Confirm drawn boundary, use VAP to select depth <sup>1</sup>
“s”		x	Concentration and stability at FTC boundary
“t”		x	Monitoring well at VAP-21 (deeper than 20’)

<sup>1</sup> PFAS was detected at 47 feet bgs at VAP-PZ-66, but a well was not set at this depth.

**Monitoring wells where PFAS sampling *not* needed in Interim Monitoring Plan**

Monitoring Well ID	Notes
PZ-35-48	PZ-35-37 to be sampled and it is representative of this next depth interval
TW-04	TW-02 upgradient at same shallow depth with similar PFAS results
TW-01	PZ-73-16 upgradient at similar shallow depth with similar PFAS results

# Attachment A: Copy of Figure 10 from JCI/Tyco's Apr. 2023 SI Status Report with Proposed and Recommended New Well Locations Identified



Location			VAP-32	
Depth (ft)	PFOS	PFOA		
6-10	10	29		
16-20	<0.47 U	76		
24-28	<0.48 U	33		

Location			VAP-13	
Depth (ft)	PFOS	PFOA		
4-8	4.38 J	10.2 J		
14-18	<2.54 U	16.3		
24-28	<2.91 U [ $<2.10$ U]	15.8 J [12.0]		

Location			VAP-21	
Depth (ft)	PFOS	PFOA		
6-10	<1.71 U	4.75		
16-20	<1.87 U	1140		
26-30	<1.87 U	48.5		
36-40	<1.91 U	538		
46-50	<1.71 U	25.9		

Location			VAP-35	
Depth (ft)	PFOS	PFOA		
11-15	<0.49 U [ $<0.50$ U]	3.7 [4.0]		
21-25	0.82 J	78		
31-35	<0.53 U	74		
46-50	<0.48 U	0.98 J		

**LEGEND:**

- APPROXIMATE MARINETTE CITY BOUNDARY
- APPROXIMATE SITE PROPERTY BOUNDARY
- APPROXIMATE STANTON STREET FACILITY PROPERTY BOUNDARY
- PRIVATE WELL SAMPLING AREA
- SURFACE WATER TREATMENT SYSTEM
- CULVERT
- DITCH OR STREAM
- STANTON STREET HYDRAULIC BARRIER WALL
- 20 NGL PFOA+PFOS CONTOUR
- 20 NGL PFOA+PFOS CONTOUR
- OVERBURDEN MONITORING WELL OR PIEZOMETER
- BEDROCK MONITORING WELL OR PIEZOMETER
- OVERBURDEN MONITORING WELL (STANTON STREET)
- BEDROCK MONITORING WELL (STANTON STREET)
- GROUNDWATER SAMPLING BORING

**LOCATION**

DEPTH INTERVAL (FT BGS)	PZ-63	OVERBURDEN (WHITE)
8-10	15	
16-20	11	
20-28	35	
35-37	71	
42-44	1600 D	
48-55	1300	INTERFACE/ BEDROCK (BROWN)
55-60	1300	

**CONCENTRATION (NGL)**

### JCI/Tyco's Proposed New Wells from Aug. 2023 SI Work Plan

- A** New Overburden Monitoring Well(s)
- D** New Bedrock Monitoring Well

### DNR Recommended Additions to Interim Monitoring Plan

- r** New Overburden Monitoring Well
- n** New Bedrock Monitoring Well
- o** Existing Overburden Monitoring Well
- o** Existing Bedrock Monitoring Well

**NOTES:**

- CONCENTRATIONS ARE IN NANOGRAM PER LITER (NGL). DEPTH INTERVALS ARE FEET BELOW GROUND SURFACE (FT BGS).
- UNDERLINED INTERVALS INDICATE THAT THE SAMPLE WAS COLLECTED FROM A PERMANENT WELL. ITALIZED INTERVALS INDICATE THAT THE SAMPLE WAS COLLECTED FROM A TEMPORARY BOREHOLE.
- THE 20 NGL AND 20 NGL PFOA+PFOS CONTOUR LINES ILLUSTRATE THE EXTENT OF THE PLUME REGARDLESS OF DEPTH (I.E. THE MAXIMUM EXTENT OF THE PLUME ON ALL MAPS PROVIDED IN APPENDIX).
- NO VAP SAMPLES WERE COLLECTED FROM THE EAST SIDE OF DITCH A AT HEATH LANE IN 2022. VAP-38 COMPLETED IN JUNE 2018, CONSTITUTED THE EASTERN VAP BORING. RESULTS ARE INCLUDED FOR REFERENCE.
- AERIAL IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.
- DATA QUALIFIERS:
  - < = THE RESULT IS NON-DETECT AT THE REPORTING LIMIT.
  - D = THE ANALYTE WAS ANALYZED AT DILUTION.
  - J = THE RESULT IS AN ESTIMATED QUANTITY. THE ASSOCIATED NUMERICAL VALUE IS THE APPROXIMATE CONCENTRATION OF ANALYTE IN THE SAMPLE.
  - U = THE RESULT IS AN ESTIMATED QUANTITY. THE RESULT MAY BE BIASED LOW.
  - UB = THE ANALYTE IS CONSIDERED NONDETECT AT THE LISTED VALUE DUE TO ASSOCIATED BLANK CORRECTION.
  - UJ = THE ANALYTE WAS ANALYZED BY WAS NOT DETECTED. THE REPORTED REPORTING LIMIT IS APPROXIMATE AND MAY BE INACCURATE OR IMPRECISE.

