FPM group Engineering and Environmental Science

An Olgoonik Company

CORPORATE HEADQUARTERS
640 Johnson Avenue
Suite 101
Bohemia, NY 11716
631-737-6200
Fax 631-737-2410

June 4, 2024

Ms. Jasmine Stefansky
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7013

Re: **Groundwater Monitoring Report – Re-revised**
Liberty Industrial Finishing Site, NYSDEC #152108
500-550 Suffolk Avenue, Brentwood, NY
FPM File #1389g-22-03

Dear Jasmine:

FPM Group, Ltd. (FPM) has prepared this report on behalf of 550 Liberty Plaza, LLC to document the August 28, 2023 groundwater monitoring activities at the above-referenced Site conducted in accordance with recent correspondence from the New York State Department of Environmental Conservation (NYSDEC). The original report dated November 22, 2023 was first revised based on NYSDEC comments received on March 12, 2024, and was revised again based on NYSDEC comments received on May 23, 2024. The locations of the recently-installed onsite wells used for long-term groundwater monitoring are denoted in red on the attached Figure 1. The groundwater monitoring procedures and results are documented below. Procedures were in general accordance with the recently-updated Site Management Plan (SMP), which is pending NYSDEC approval, and associated documents, and all monitoring work was performed by FPM environmental professionals (EPs).

Wells MW-2A, MW-3A, MW-4A MW-7A and MW-17A were installed in April 2023 as replacements for wells MW-02, MW-03, MW-04, MW-07 and MW-17, respectively. The former wells had been damaged during Site redevelopment. The replacement wells were installed in close proximity to and with the same screened intervals as the wells they replaced, as documented in our June 26, 2023 well installation report.

Groundwater Monitoring Procedures

FPM EPs conducted groundwater monitoring on August 28, 2023 in coordination with the NYSDEC's contractor that conducts offsite groundwater monitoring. Each well was observed to be intact and secured, with no indications of damage or tampering. The depth to the static water level and depth of each well were measured to the nearest 0.01 foot with a decontaminated interface probe and the measurements were recorded on well sampling forms, copies of which are included in Attachment A. The potential presence of non-aqueous-phase liquid (NAPL) was also assessed and no NAPL was identified. The minimum volume of groundwater to be purged was calculated and purging was conducted using a decontaminated stainless steel submersible pump with dedicated HDPE tubing. Purging was conducted until the turbidity level was well below 25 NTU as the NYSDEC had directed that the samples not be filtered.

Following the removal of each well volume, field parameters, including pH, turbidity, specific conductivity, and temperature, were monitored and recorded. When all stability parameters varied by less than 10 percent between the removal of successive well volumes, and the turbidity was well below 25 NTU, the

well was sampled. Well purging water was examined and no visible indications suggestive of potential contamination were noted. The purged groundwater was discharged to the ground surface adjacent to the well from which the water was derived and allowed to infiltrate, in accordance with the SMP.

Samples for per- and polyfluoroalkyl substances (PFAS) were obtained before any other sampling was performed. PFAS samples were obtained using only dedicated disposable HDPE tubing. The retrieved samples were decanted into laboratory-supplied sample containers that were sealed, labeled, managed, transported, and tracked as described below.

Following the completion of PFAS sampling, and after those samples were properly secured, the wells were each sampled first for 1,4-dioxane, followed by sampling for Target Analyte List (TAL) metals. Samples for all analyses were obtained directly from the pump using the HDPE tubing. These samples were also obtained, containerized, labeled and managed under chain of custody procedures and in accordance with laboratory recommendations, as described below.

Each sample was collected into laboratory-provided containers, which were labeled as to the sample name, date and time of sampling, sampler initials, and analyses to be performed. The filled sample containers were placed into a cooler with ice and a chain of custody form was completed to document the sequence of sample custody. Samples to be tested for PFAS were managed in a separate cooler from the other samples. At the end of the sampling event, the filled coolers were transported to FPM's office for pickup by a laboratory courier.

Quality assurance/quality control (QA/QC) samples were also collected in accordance with the SMP. QA/QC samples included one blind duplicate sample, one matrix spike/matrix spike duplicate (MS/MSD) sample, and one equipment blank sample.

The groundwater and QA/QC samples were managed under chain of custody and transmitted to Eurofins Edison, NJ lab, which is New York State Department of Health ELAP-certified for the analyses that were performed. The samples were tested for TAL metals, including mercury, 1,4-dioxane, and PFAS, as required in the updated SMP. The lab data were provided to FPM in Category B deliverables, together with information needed for upload to the NYSDEC's data management system.

FPM reviewed the laboratory data packages and compared the groundwater sample results to the NYSDEC's Class GA Ambient Water Quality Standards (Standards). FPM also prepared Data Usability Summary Reports (DUSRs) to evaluate data quality, as required in the SMP. As documented in the DUSRs (Attachment B), no significant issues were identified with data quality and the data can be relied on for their intended purpose. The sample information is in the process of being uploaded to the NYSDEC's EIMS.

Groundwater Monitoring Results

Groundwater Flow Direction

The depth to groundwater and previously-surveyed top of casing elevations were integrated to calculate the water table elevations or, in the case of MW-17A, the potentiometric surface elevation. These data are listed on Table 1 and shown graphically on Figure 2. The groundwater flow direction for the water table aquifer is to the south-southeast, consistent with prior groundwater flow direction determinations. The horizontal hydraulic gradient is calculated as 0.00017, which is also consistent with prior gradients.

A comparison of the water levels for paired wells MW-7A and MW-17A shows that the vertical direction of groundwater flow is downward from the water table toward deeper portions of the aquifer. The vertical hydraulic gradient is calculated as -0.00013, which is also generally consistent with prior measurements.

Groundwater Quality

The sample results for metals and 1,4-dioxane from this monitoring event are presented on Table 2 and are compared to the NYSDEC Standards. The results for the metals of interest for this Site (cadmium, chromium, copper, nickel, and zinc) are noted in red type on this table and exceedances of the NYSDEC Standards are noted by gray shading. Data from prior monitoring events extending back to 2011 are also shown on Table 2 for comparison purposes (note: prior data for MW-7 and MW-17 are available for 2018 and 2019 only). The data from the August 2023 monitoring event are shown on Figure 3, together with the data provided by EA for the offsite monitoring wells.

The following observations were noted for metals:

- For MW-2A/MW-2, no Site-related metals were detected above the Standards in 2023, 2019, 2018 or 2015. Iron was detected above its Standard in 2023 but not in filtered samples collected in prior years. These results indicate that the well MW-2A/MW-2 location is not in the present footprint of the Site-related groundwater plume.
- For MW-3A/MW-3 no Site-related metals were detected above Standards in 2023. Sodium (not Site-related) was detected above its Standard in 2023. In 2019 chromium (Site-related), iron, and sodium were detected above their Standards. Cadmium and/or chromium were detected above NYSDEC Standards in filtered samples collected in 2017 and prior years. These results indicate that the well MW-3A/MW-3 location was previously in the Site-related groundwater plume, but MW-3A is not presently located in the plume.
- For MW-4A/MW-4, cadmium (Site-related), chromium (Site-related), and sodium (not Site-related) were detected in 2023 above the Standards. Cadmium and/or chromium were detected above Standards in well MW-4 in 2019 and prior years. These results indicate that the well MW-4A/MW-4 location is in the Site-related groundwater plume; the levels of Site-related metals have remained relatively constant between 2011 and 2023.
- For MW-7A/MW-7, sodium (not Site-related) was the only metal detected in 2023 above the Standards. Iron and sodium were detected above Standards in former well MW-7 in 2019 and no exceedances were detected in 2018. These results indicate that the well MW-7A/MW-7 location, which is on the north side of the Site upgradient of historical Site operations, is not within the Site-related groundwater plume. The results from MW-7/MW-7A are indicative of the quality of shallow groundwater migrating onto the Site.
- For MW-17A/MW-17, beryllium, iron, manganese, and sodium (not Site-related metals) were the only metals detected in 2023 above the Standards. Cadmium (Site-related), manganese, and sodium were detected above Standards in the filtered sample from former well MW-17 in 2019; cadmium was not detected above its Standard in the filtered sample from MW-17 in 2018. The well MW-17A/MW-17 location is on the north edge of the Site and upgradient of historical Site operations and the Site-related groundwater plume. The MW-17/MW-17A results are indicative of the quality of deeper groundwater migrating onto the Site.

The following observations were noted for 1,4-dioxane:

- None of the groundwater samples contained detectable concentrations of 1,4-dioxane.

The sample results for PFAS are presented on Table 3 and are compared to current (April 2023) NYSDEC Guidance. PFAS detections are noted in bold type and exceedances of the current NYSDEC Guidance values are highlighted in yellow. The following observations were noted for PFAS compounds:

- PFOS and PFOA were detected in both upgradient wells, including the water table well MW-7A and the deeper well MW-17A, at levels above NYSDEC Guidance. PFOS concentrations ranged from 4.54 to 9.07 nanograms per liter (ng/l) and PFOA concentrations ranged from 10.7 to 17.7 ng/l in these wells.
- PFOS and PFOA were detected in all the downgradient wells (MW-2A through MW-4A), with nearly all the detections exceeding NYSDEC Guidance. PFOS concentrations ranged from 30.4 ng/l in MW-2A to 392 ng/l in MW-4A and are higher in these wells than in the upgradient wells. PFOA concentrations in these wells are comparable to but slightly lower than the concentrations in the upgradient wells, with 10.6 ng/l detected in MW-2A and 10.5 ng/l detected in MW-4A.
- Other PFAS compounds, including PFBA, PFBS, PFHpA, PFHxS, PFHxA, and PFPeA, were detected in nearly all the wells, with comparable concentrations detected in both the upgradient and downgradient wells.

Collectively, these results demonstrate that PFAS compounds are present in onsite groundwater both upgradient and downgradient of the historic operations area and are present in both shallow and deeper groundwater. PFOS and PFOA were detected in both upgradient wells, including the water table well MW-7A and the deeper well MW-17A, at levels above NYSDEC Guidance. The concentrations of PFOS and PFOA exceed NYSDEC Guidance in both the upgradient and downgradient wells, although the concentrations of PFOS are higher in the downgradient wells than in the upgradient wells. The PFOS concentrations are highest at MW-4A, which also exhibited the highest concentrations of Site-related metals.

Discussion

1,4-dioxane was not detected in any of the upgradient or downgradient wells at this Site and does not appear to present a concern at this Site. Continued monitoring for 1,4-dioxane is not anticipated to provide any useful information to assess Site-related groundwater impacts.

For MW-2 the following observations and conclusions are noted:

- The historic results (2013 and prior) show occasional detections of cadmium just above its NYSDEC Standard of 5 ug/l and/or chromium just above its NYSDEC Standard of 50 ug/l. None of the historic detections of copper, nickel or zinc exceeded Standards. There have been no detections of Site-related metals in this well from 2015 to present. Based on these observations, continued monitoring at the MW-2/MW-2A location is not anticipated to provide any further useful information to assess Site-related groundwater impacts.

For MW-3 the following observations and conclusions were noted:

- There have been no exceedances of the NYSDEC Standards for copper, nickel, or zinc in this well from 2011 to the present. Cadmium was detected in 2016 and 2017 in filtered samples at levels just above the NYSDEC Standard, but was below the Standard in prior filtered samples. Although chromium was detected above its Standard in filtered samples during several sampling

events between 2012 and 2015, only one detection above Standards (56 ug/l in 2019) has been reported for filtered samples since 2015. Based on these observations, Site-related cadmium and chromium impacts formerly detected in this well had decreased to below or just above Standards by 2018/2019 and the current data show no exceedances for these metals. Continued monitoring at the MW-3/MW-3A location is anticipated to provide only limited information to define the eastern lateral extent of groundwater impacts from Site-related metals.

For MW-4 the following observations and conclusions were noted:

- There have been no exceedances of the NYSDEC Standards for copper, nickel or zinc from 2011 to the present. Cadmium was detected in filtered samples during the 2011 to 2019 sampling events at levels above the NYSDEC Standard (11 to 83 ug/l); the 2023 result (90.6 ug/l) is similar. Chromium was detected in 2023 and in some of the historic sampling events in filtered samples at levels somewhat above its Standard. There does not appear to be any discernable trend in the chromium levels, which have ranged from non-detect to 142 ug/l in filtered samples. Based on these observations, Site-related cadmium and chromium impacts remain present in this well at levels above Standards and have not changed appreciably since 2011. Monitoring of this well should be continued to assess groundwater impacts from Site-related metals.

For MW-7A the following observations and conclusions were noted:

- Site-related metals have not been detected above Standards in this well, which is on the north side of the Site upgradient of historical Site operations and not within the Site-related groundwater plume. The results from this well are indicative of the quality of shallow groundwater migrating onto the Site.

For MW-17A the following observations and conclusions were noted:

- No Site-related metals were detected above the Standards in 2023. Cadmium was detected above its Standard in 2019 in the filtered sample from former well MW-17 but was not detected above its Standard in the filtered sample in 2018. The MW-17A/MW-17 well location is on the north side of the Site and upgradient of historical Site operations. Based on its location, well MW-17/MW-17A is not within the Site-related groundwater plume and the results are indicative of the quality of deeper groundwater migrating onto the Site.

Conclusions and Recommendations

Site-related metals impacts remain present at the MW-4/MW-4A location and, to a lesser extent, at the MW-3/MW-3A location. PFOS and PFOA are present in the onsite groundwater at levels above current NYSDEC Guidance in both upgradient and downgradient groundwater. The concentrations of PFOS, PFOA, and other PFAS compounds are similar at both the upgradient and downgradient wells, except for PFOS at MW-3A and MW-4A where somewhat higher concentrations were noted. 1,4-dioxane was not detected in any of the onsite monitoring wells.

We note that the remaining source area has been capped since 2001 (over 20 years). The cap was recently removed for redevelopment, additional source soil was removed and disposed, and the cap was re-established during construction. These activities do not appear to have resulted in any significant changes to groundwater conditions.

Based on the foregoing, we recommend the following:

- Monitoring for 1,4-dioxane should be discontinued for this Site as this constituent was not detected in any of the onsite monitoring wells. Continued sampling for this constituent is not anticipated to provide any useful information and will require resources that could otherwise be conserved.
- Monitoring at well MW-2A should be discontinued. Site-related metals impacts formerly detected at low levels at this location have not been present above applicable regulatory criteria from 2015 to the present. The most recent exceedances of the NYSDEC Standards noted for Site-related metals in this well were for chromium in 2013 and cadmium in 2011. PFAS detections are comparable to, or just slightly higher than, the levels observed in the upgradient wells. Continued monitoring at MW-2A location is not anticipated to provide any further useful information to assess Site-related groundwater impacts and will require resources that could otherwise be conserved. As a contingency, monitoring at well MW-2A should be restarted if Site-related metals are detected in nearby well MW-3A above Standards.
- One additional round of monitoring should be performed at the deeper upgradient well MW-17A to confirm the 2023 results. If the results continue to show no exceedances of the NYSDEC Standards for Site-related metals, then monitoring should be discontinued. The data obtained from the shallow well in this area provides sufficient information to assess upgradient groundwater quality in the zone of interest. Providing the 2023 results are confirmed, continued monitoring at MW-17A location is not anticipated to provide any further useful information to assess the quality of groundwater that is migrating onto the Site and will require resources that could otherwise be conserved.
- Monitoring for Site-related metals and for PFAS should be continued at the shallow upgradient well (MW-7A) and the shallow downgradient wells MW-3A and MW-4A. Site-related impacts remain present in these downgradient wells and the monitoring data are anticipated to provide useful information to assess the nature and extent of the remaining onsite impacts, evaluate changes in Site-related groundwater conditions over time, and provide water quality information upgradient of the offsite plume.

If you have any questions, please contact me at (631) 737-6200, ext. 528.

Very truly yours,

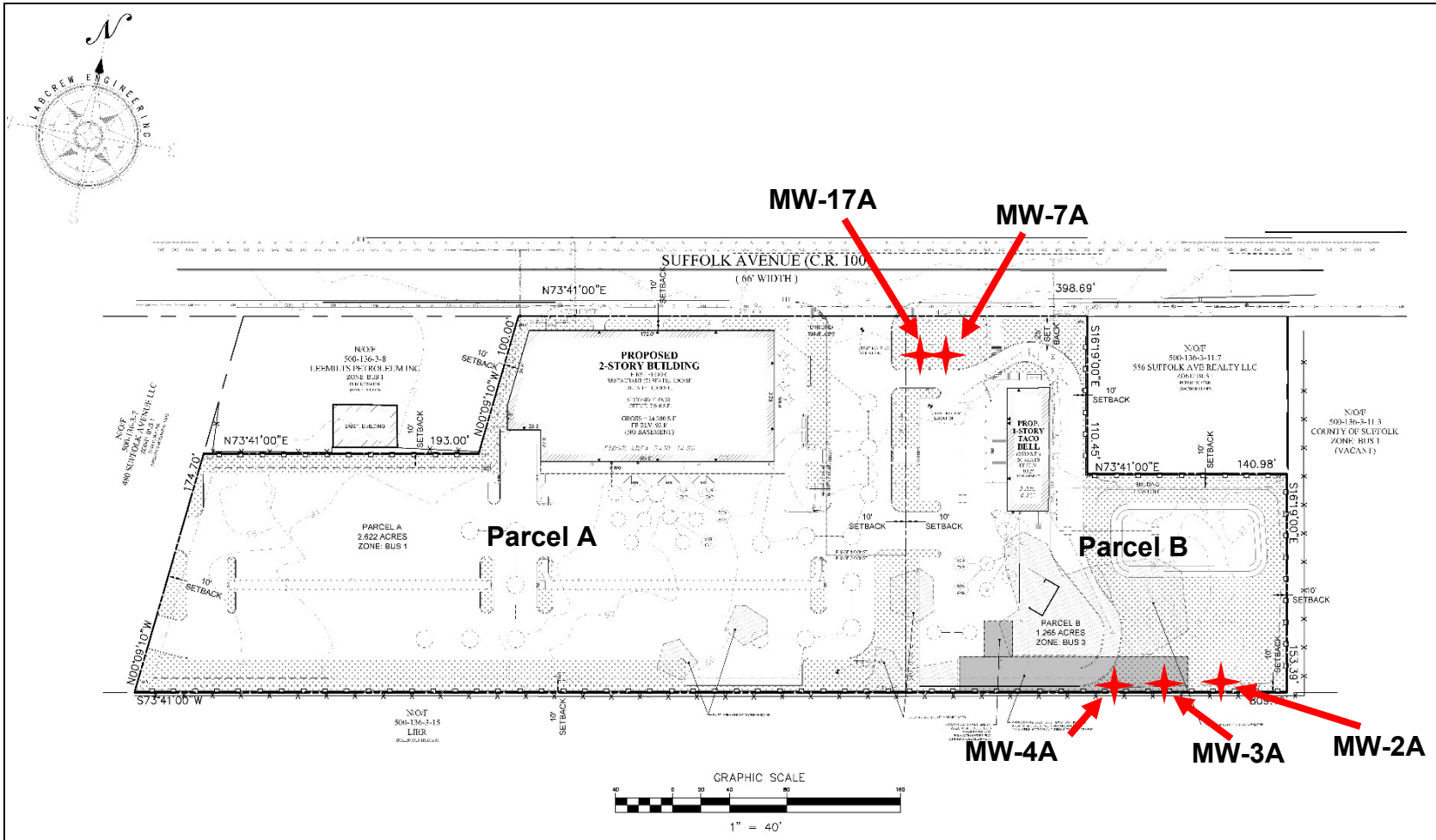
Stephanie O. Davis, P.G.

Stephanie O. Davis, PG
Senior Project Manager
Vice President

Cc: Aaron Daniels and Cristina Mendez, 550 Liberty Plaza, LLC

Attachments
SOD/sod

S:\Liberty Industrial\GW Monitoring\2023 Monitoring\GW Monitoring Report 8-2023Revised6-2024-LibertyIndustrial.docx



FPM GROUP

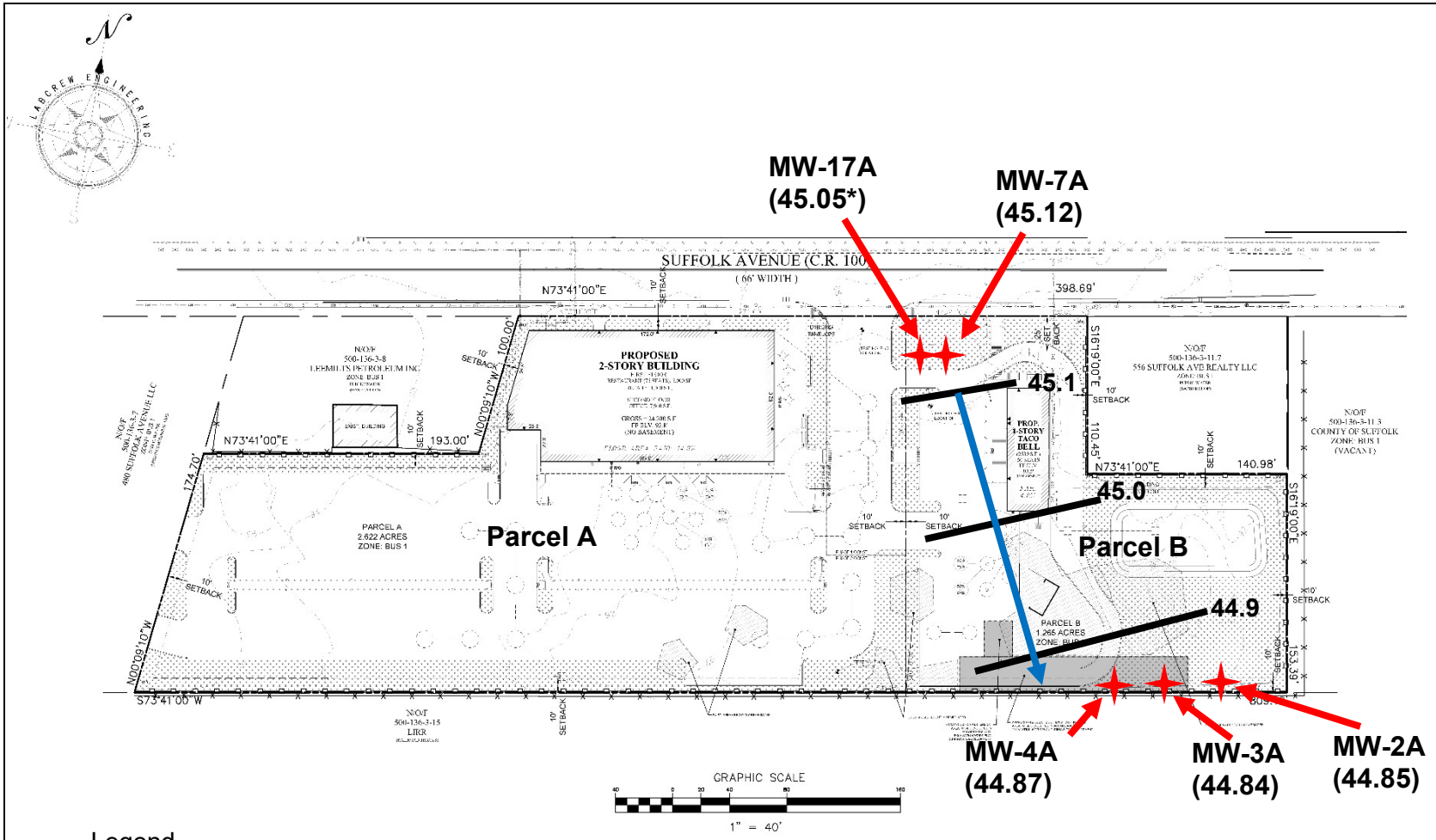
FIGURE 1
REPLACEMENT MONITORING WELLS

550 Suffolk Avenue
Brentwood, New York

Drawn by: SOD Checked By: SOD Date: 4/25/2023

S:\Liberty Industrial\Well installation\Fig1-Replacement Well Locations.docx

FPM



Legend

(45.12) = Water Table Elevation (feet, NAVD 1988)

(45.05*) = Potentiometric Surface Elevation (feet, NAVD 1988)

45.1 = Water Table Contour

= Groundwater Flow Direction

FPM GROUP

FIGURE 2
GROUNDWATER FLOW DIRECTION
AUGUST 28, 2023
550 Suffolk Avenue, Brentwood, New York

Drawn by: SOD Checked By: SOD Date: 4/25/2023

FPM

Well No.	MW-17A		NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
	Result	Q	
Target Analyte List Metals in micrograms per liter (ug/l)			
Beryllium	5.3		3
Cadmium	1.5	J	5
Chromium	2.6	J	50
Copper	8.3		200
Iron	437		300
Manganese	622		300
Nickel	9.9		100
Sodium	26,400		20,000
Zinc	61.4		2,000
1,4-Dioxane in ug/l			
1,4-Dioxane	0.072	U	0.35
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l)			
Perfluorobutanesulfonic acid (PFBS)	4.84		-
Perfluorobutanoic acid (PFBA)	6.05	J	-
Perfluoroheptanoic acid (PFHpA)	8.98		-
Perfluorohexanesulfonic acid (PFHxS)	1.32	J	-
Perfluorohexanoic acid (PFHxA)	18.8		-
Perfluorononanoic acid (PFNA)	0.50	J	-
Perfluorooctanesulfonic acid (PFOS)	4.54		2.7
Perfluorooctanoic acid (PFOA)	17.7		6.7
Perfluoropentanoic acid (PFPeA)	12.7		-

Well No.	MW-7A		NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
	Result	Q	
Target Analyte List Metals in micrograms per liter (ug/l)			
Cadmium	0.77	J	5
Chromium	1.7	U	50
Copper	2.2	J	200
Nickel	2.3	J	100
Sodium	24,400		20,000
Zinc	15.7	J	2,000
1,4-Dioxane in ug/l			
1,4-Dioxane	0.072	U	0.35
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l)			
Perfluorobutanesulfonic acid (PFBS)	24.5		-
Perfluorobutanoic acid (PFBA)	19.6		-
Perfluoroheptanoic acid (PFHpA)	5.53		-
Perfluorohexanesulfonic acid (PFHxS)	31.1		-
Perfluorohexanoic acid (PFHxA)	10.8		-
Perfluorooctanesulfonic acid (PFOS)	7.27		2.7
Perfluorooctanoic acid (PFOA)	10.7		6.7
Perfluoropentanesulfonic acid (PFPeS)	0.75	J	-
Perfluoropentanoic acid (PFPeA)	13.7		-

Well No.	MW-3A		NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
	Result	Q	
Target Analyte List Metals in micrograms per liter (ug/l)			
Cadmium	1.6	J	5
Chromium	48.4		50
Copper	2.0	U	200
Nickel	4.6		100
Sodium	32,700		20,000
Zinc	24.8		2,000
1,4-Dioxane in ug/l			
1,4-Dioxane	0.072	U	0.35
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l)			
Perfluorobutanesulfonic acid (PFBS)	4.66		-
Perfluorobutanoic acid (PFBA)	8.37		-
Perfluoroheptanesulfonic acid (PFHpS)	0.35	J	-
Perfluoroheptanoic acid (PFHpA)	3.05		-
Perfluorohexanesulfonic acid (PFHxS)	1.33	J	-
Perfluorohexanoic acid (PFHxA)	4.77		-
Perfluorononanoic acid (PFNA)	0.83	J	-
Perfluorooctanesulfonic acid (PFOS)	207		2.7
Perfluorooctanoic acid (PFOA)	6.48		6.7
Perfluoropentanoic acid (PFPeA)	4.63	I	-

Well No.	MW-2A		NYSDEC Class GA Ambient Water Quality Standards & Guidance Values
	Result	Q	
Target Analyte List Metals in micrograms per liter (ug/l)			
Cadmium	1.5	J	5
Chromium	17.2		50
Copper	4.9		200
Iron	864		300
Nickel	7.7		100
Zinc	48.1		2,000
1,4-Dioxane in ug/l			
1,4-Dioxane	0.072	U	0.35
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l)			
6:2 FTS	4.56	J	-
Perfluorobutanesulfonic acid (PFBS)	3.28		-
Perfluorobutanoic acid (PFBA)	6.20	J	-
Perfluoroheptanesulfonic acid (PFHpS)	0.40	J	-
Perfluoroheptanoic acid (PFHpA)	3.65		-
Perfluorohexanesulfonic acid (PFHxS)	1.47	J	-
Perfluorohexanoic acid (PFHxA)	6.62		-
Perfluorononanoic acid (PFNA)	0.82	J	-
Perfluorooctanesulfonic acid (PFOS)	30.4		2.7
Perfluorooctanoic acid (PFOA)	10.6		6.7
Perfluoropentanoic acid (PFPeA)	5.65		-

Well No.	MW-4A		MW-44A (Duplicate)		NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
	Result	Q	Result	Q	
Target Analyte List Metals in micrograms per liter (ug/l)					
Cadmium	90.6		89.7		5
Chromium	99.5		100		50
Copper	4.7		4.8		200
Nickel	38.1		38.2		100
Sodium	29,400		29,800		20,000
Zinc	15.6	J	13.9	J	2,000
1,4-Dioxane in ug/l					
1,4-Dioxane	0.072	U	0.072	U	0.35
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l)					
6:2 FTS	3.32	J	2.45	J	-
Perfluorobutanesulfonic acid (PFBS)	3.58		3.94		-
Perfluorobutanoic acid (PFBA)	15.2		15.5		-
Perfluoroheptanesulfonic acid (PFHpS)	1.05	J	0.96	J	-
Perfluoroheptanoic acid (PFHpA)	5.52		5.36		-
Perfluorohexanesulfonic acid (PFHxS)	3.77		3.35		-
Perfluorohexanoic acid (PFHxA)	14.7		13.9		-
Perfluorononanoic acid (PFNA)	1.15	J	1.12	J	-
Perfluorooctanesulfonic acid (PFOS)	386		392		2.7
Perfluorooctanoic acid (PFOA)	9.78		10.5		6.7
Perfluoropentanesulfonic acid (PFPeS)	0.66	J	0.74	J	-
Perfluoropentanoic acid (PFPeA)	14.8		14.5		-

Sample Location	MW-10	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/29/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	96	5
Chromium, Total	55.2	50
Copper	< 4.0 U	200
Iron	380	300
Nickel	7.4	100
Zinc	< 10 U	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	13.7	-
Perfluorobutanoic Acid	6.6 J	-
Perfluoroheptanoic acid (PFHpA)	6.7	-
Perfluorohexanesulfonic acid (PFHxS)	1.2 J	-
Perfluorohexanoic acid (PFHxA)	4.4	-
Perfluorononanoic acid (PFNA)	0.72 J	-
Perfluorooctanesulfonic acid (PFOS)	112.0	2.7
Perfluorooctanoic acid (PFOA)	5.8	6.7
Perfluoropentanoic Acid (PFPeA)	3.0 J	-

Sample Location	MW-12	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/29/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	1.9	5
Chromium, Total	< 2.0 U	50
Copper	< 4.0 U	200
Nickel	< 2.0 U	100
Zinc	26.4	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	1.5 J	-
Perfluorobutanoic Acid	7.9	-
Perfluoroheptanoic acid (PFHpA)	3.9	-
Perfluorohexanesulfonic acid (PFHxS)	1.3 J	-
Perfluorohexanoic acid (PFHxA)	14.4	-
Perfluorononanoic acid (PFNA)	2.0	-
Perfluorooctanesulfonic acid (PFOS)	36.8	2.7
Perfluorooctanoic acid (PFOA)	7.6	6.7
Perfluoropentanoic Acid (PFPeA)	20.8	-

Sample Location	MW-14	MW-14 (duplicate)	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/28/2023	8/28/2023	
Target Analyte List Metals in micrograms per liter (ug/l)			
Cadmium	8.6	9.4	5
Chromium, Total	60.2	59.1	50
Copper	< 4.0 U	6.8	200
Iron	336	398	300
Nickel	15.7	15.2	100
Sodium	32,900	33,000	20,000
Zinc	< 10 U	12.2	2,000
1,4-Dioxane by SW8270 in ug/l			
1,4-Dioxane (P-Dioxane)	< 0.050 U	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l			
Perfluorobutanesulfonic acid (PFBS)	10.5	12.4	-
Perfluorobutanoic Acid	6.9 J	7.3	-
Perfluoroheptanesulfonic acid (PFHpS)	2.8	2.2	-
Perfluoroheptanoic acid (PFHpA)	6.3	5.7	-
Perfluorohexanesulfonic acid (PFHxS)	9.1	9.2	-
Perfluorohexanoic acid (PFHxA)	< 0.25 U	9.5	-
Perfluorononanoic acid (PFNA)	0.62 J	0.76 J	-
Perfluorooctanesulfonic acid (PFOS)	99.1	98.9	2.7
Perfluorooctanoic acid (PFOA)	10.9	10.1	6.7
Perfluoropentanesulfonic Acid (PFPeS)	1.5 J	1.9	-
Perfluoropentanoic Acid (PFPeA)	9.4	9.9	-

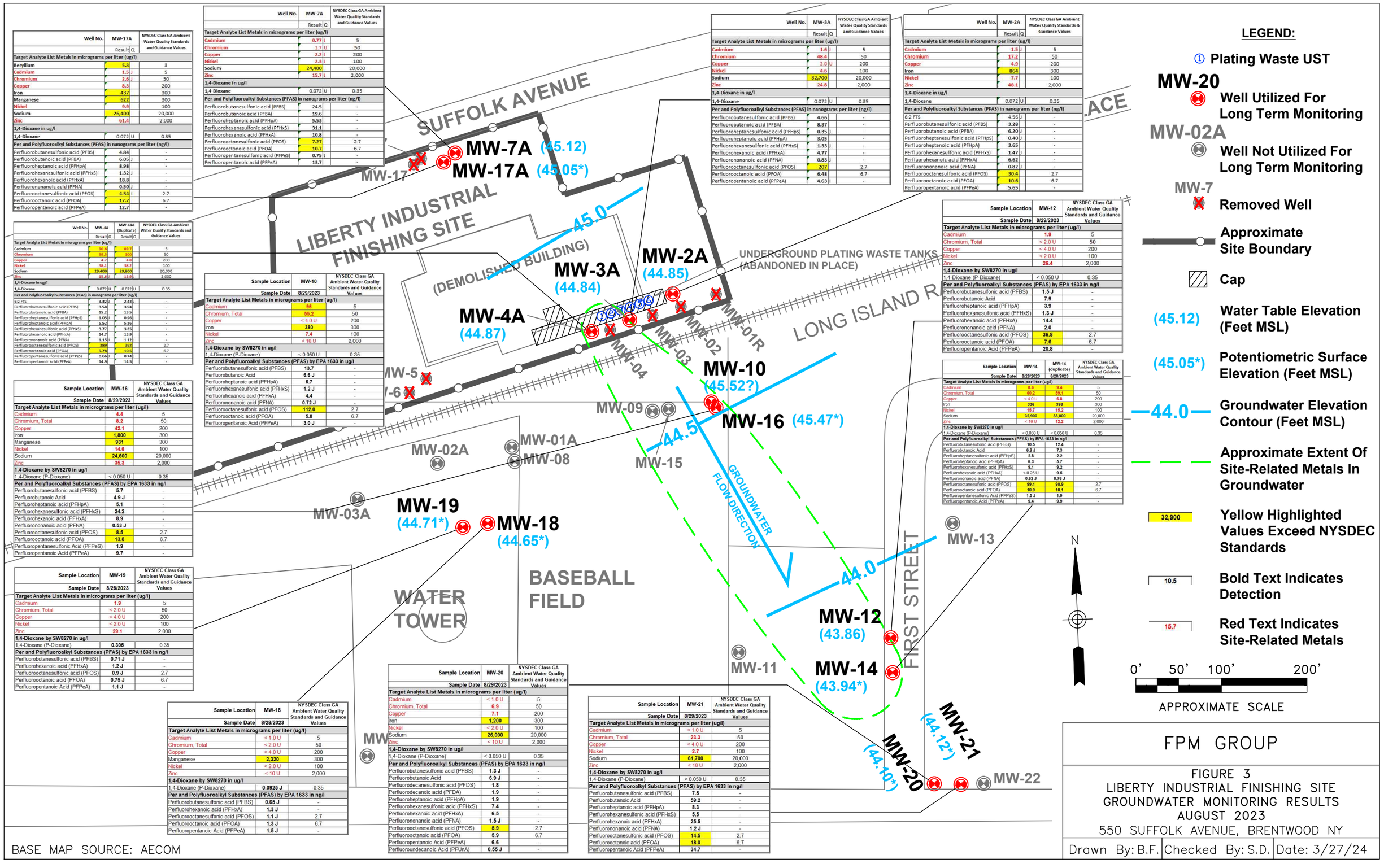
Sample Location	MW-16	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/29/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	4.4	5
Chromium, Total	8.2	50
Copper	42.1	200
Iron	1,800	300
Manganese	931	300
Nickel	14.6	100
Sodium	24,600	20,000
Zinc	35.3	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	5.7	-
Perfluorobutanoic Acid	4.9 J	-
Perfluoroheptanoic acid (PFHpA)	5.1	-
Perfluorohexanesulfonic acid (PFHxS)	24.2	-
Perfluorohexanoic acid (PFHxA)	8.9	-
Perfluorononanoic acid (PFNA)	0.53 J	-
Perfluorooctanesulfonic acid (PFOS)	8.5	2.7
Perfluorooctanoic acid (PFOA)	13.8	6.7
Perfluoropentanesulfonic Acid (PFPeS)	1.9	-
Perfluoropentanoic Acid (PFPeA)	9.7	-

Sample Location	MW-19	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/28/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	1.9	5
Chromium, Total	< 2.0 U	50
Copper	< 4.0 U	200
Nickel	< 2.0 U	100
Zinc	29.1	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	0.305	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	0.71 J	-
Perfluorohexanoic acid (PFHxA)	1.2 J	-
Perfluorooctanesulfonic acid (PFOS)	0.9 J	2.7
Perfluorooctanoic acid (PFOA)	0.76 J	6.7
Perfluoropentanoic Acid (PFPeA)	1.1 J	-

Sample Location	MW-18	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/28/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	< 1.0 U	5
Chromium, Total	< 2.0 U	50
Copper	< 4.0 U	200
Manganese	2,320	300
Nickel	< 2.0 U	100
Zinc	< 10 U	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	0.0925 J	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	0.55 J	-
Perfluorohexanoic acid (PFHxA)	1.3 J	-
Perfluorooctanesulfonic acid (PFOS)	1.1 J	2.7
Perfluorooctanoic acid (PFOA)	1.3 J	6.7
Perfluoropentanoic Acid (PFPeA)	1.5 J	-

Sample Location	MW-20	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/29/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	< 1.0 U	5
Chromium, Total	6.9	50
Copper	7.1	200
Iron	1,200	300
Nickel	26,000	100
Sodium	26,000	20,000
Zinc	< 10 U	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	1.3 J	-
Perfluorobutanoic Acid	6.9 J	-
Perfluorodecanesulfonic acid (PFDS)	1.8	-
Perfluorodecanoic acid (PFDA)	1.9	-
Perfluoroheptanoic acid (PFHpA)	1.9	-
Perfluorohexanesulfonic acid (PFHxS)	7.4	-
Perfluorohexanoic acid (PFHxA)	6.5	-
Perfluorononanoic acid (PFNA)	1.5 J	-
Perfluorooctanesulfonic acid (PFOS)	5.9	2.7
Perfluorooctanoic acid (PFOA)	5.9	6.7
Perfluoropentanoic acid (PFPeA)	6.6	-
Perfluoroundecanoic Acid (PFUnA)	0.55 J	-

Sample Location	MW-21	NYSDEC Class GA Ambient Water Quality Standards and Guidance Values
Sample Date	8/29/2023	
Target Analyte List Metals in micrograms per liter (ug/l)		
Cadmium	< 1.0 U	5
Chromium, Total	23.3	50
Copper	< 4.0 U	200
Nickel	2.7	100
Sodium	61,700	20,000
Zinc	< 10 U	2,000
1,4-Dioxane by SW8270 in ug/l		
1,4-Dioxane (P-Dioxane)	< 0.050 U	0.35
Per and Polyfluoroalkyl Substances (PFAS) by EPA 1633 in ng/l		
Perfluorobutanesulfonic acid (PFBS)	7.5	-
Perfluorobutanoic Acid	59.2	-
Perfluoroheptanoic acid (PFHpA)	8.3	-
Perfluorohexanesulfonic acid (PFHxS)	5.5	-
Perfluorohexanoic acid (PFHxA)	25.5	-
Perfluorononanoic acid (PFNA)	1.2 J	-
Perfluorooctanesulfonic acid (PFOS)	14.5	2.7
Perfluorooctanoic acid (PFOA)	18.0	6.7
Perfluoropentanoic Acid (PFPeA)	34.7	-



LEGEND:

- ① Plating Waste UST
- MW-20 — Well Utilized For Long Term Monitoring
- MW-02A — Well Not Utilized For Long Term Monitoring
- MW-7 — Removed Well
- Approximate Site Boundary
- Cap
- (45.12) — Water Table Elevation (Feet MSL)
- (45.05*) — Potentiometric Surface Elevation (Feet MSL)
- —44.0— Groundwater Elevation Contour (Feet MSL)
- Approximate Extent Of Site-Related Metals In Groundwater
- 32,900 — Yellow Highlighted Values Exceed NYSDEC Standards
- 10.5 — Bold Text Indicates Detection
- 15.7 — Red Text Indicates Site-Related Metals

BASE MAP SOURCE: AECOM

FPM GROUP

FIGURE 3
LIBERTY INDUSTRIAL FINISHING SITE
GROUNDWATER MONITORING RESULTS
AUGUST 2023
550 SUFFOLK AVENUE, BRENTWOOD NY

Drawn By: B.F. | Checked By: S.D. | Date: 3/27/24

H:\EAST HAMPTON AIRPORT\R_FS\FIGURE 3 240603.dwg, 6/4/2024 10:27:07 AM, AutoCAD PDF (High Quality Print).pc3

Table 1
Well Construction and Depth to Water Data
Liberty Industrial Finishing Site, #152108
500-550 Suffolk Avenue, Brentwood, NY

Well No.	Latitude	Longitude	Top of Manhole Elevation	Top of Casing Elevation	Total Well Depth (feet below TOC)	Well Screen Interval (feet below TOC)	Well Diameter (inches)	Screen Slot Size (inches)	Initial Depth to Water (feet below TOC) April 2023	Depth to Water (feet below TOC) August 28, 2023	Water Table Elevation* (feet) August 28, 2023
MW-2A	40° 46' 43.44" N	73° 15' 13.15" W	92.53	92.26	55.12	35 to 55	2	0.02	46.88	47.41	44.85
MW-3A	40° 46' 43.33" N	73° 15' 13.46" W	92.62	92.29	55.20	35 to 55	2	0.02	46.93	47.45	44.84
MW-4A	40° 46' 43.24" N	73° 15' 13.73" W	92.31	91.98	54.51	35 to 55	2	0.02	46.59	47.11	44.87
MW-7A	40° 46' 44.95" N	73° 15' 16.27" W	93.21	92.93	54.87	35 to 55	2	0.02	47.36	47.81	45.12
MW-17A	40° 46' 44.91" N	73° 15' 16.42" W	93.26	93.01	99.21	90 to 100	2	0.02	52.45	47.96	45.05

Notes:

TOC = Top of casing

Elevations based on NAVD 1988

* MW-17A is not a water table well and the water table elevation noted is actually a potentiometric surface elevation.

Table 2
Groundwater Chemical Analytical Results - MW-2/MW-2A
Liberty Industrial Finishing Site
May 2011 Through August 2023 Sampling Events

Sample Location	NYSDEC Class GA Ambient Water Quality Standards [1]	MW-2														MW-2A
Wel Depth (feet)		54.2														55
Sampling Date:		5/26/2011		8/23/2012		11/16/2013		3/18/2015		9/13/2017		11/14/2018		12/9/2019		8/28/2023
Sample Type:		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Target Analyte List Metals by USEPA Method 6010 in ug/L																
Aluminum	NS	118 B	ND	602	ND	ND	ND	1,200	ND	ND	ND	ND	ND	ND	ND	37.8 J
Antimony	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.48 U
Arsenic	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2 U
Barium	1000	44.6 B	44.9 B	39.8 B	31.9 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34.6 U
Beryllium	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 U
Cadmium	5	ND	**5.5**	3.5 B	2.7 B	ND	ND	ND	ND	2.9	3.2	ND	ND	ND	ND	1.5 J
Calcium	NS	16,300	16,700	20,400	21,500	30,000	29,000	16,000	15,000	32,000	34,000	22,000	21,000	23,000	25,000	31,900
Chromium	50	**51.9**	48.2	26.7	12.0 B	**62.0**	**59.0**	ND	ND	ND	ND	ND	ND	ND	ND	17.2
Cobalt	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 J
Copper	200	ND	ND	14.4 B	4.2 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9
Iron	300	205	ND	**853**	ND	ND	ND	**1,700**	ND	ND	ND	ND	ND	ND	ND	**864**
Lead	25	ND	ND	ND	ND	ND	ND	10.0	ND	ND	ND	ND	ND	ND	ND	0.42 U
Magnesium	35000	3,180	3,250	3,720	3,870	ND	ND	ND	ND	5,500	5,800	ND	ND	ND	ND	4,210
Manganese	300	ND	ND	17.7 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26.4
Mercury	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.091 U
Nickel	100	ND	2.7 B	4.6 B	3.3 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.7
Potassium	NS	2,720	2,610	1,710 E	1,660	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,600
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43 U
Sliver	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 U
Sodium	20000	**21,300**	**22,400**	**21,400**	**22,900**	15,000	16,000	9,600	9,700	**25,000**	**26,000**	14,000	14,000	9,400	10,000	19,900
Thallium	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 U
Vanadium	NS	ND	ND	1.4 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 U
Zinc	2000	ND	24.8	51.0	26.1 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48.1
1,4-Dioxane by Method 8270E SIM ID in ug/l																
1,4-Dioxane	0.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.072 U

Notes:

(1) 6NYCRR Part 703.5 GA Groundwater Quality Standards (GQS) and Guidance Values (GV) 6/1998

NS - No Standard

ND - Not Detected

B- Estimated Value

Groundwater Contaminant of Concern

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

U : Indicates the analyte was analyzed for but not detected.

BOLD values exceed NYSDEC Standards.

BOLD shaded values are Site-related metals that exceed NYSDEC Standards.

Table 2 (Continued)
Groundwater Chemical Analytical Results - MW-3/MW-3A
Liberty Industrial Finishing Site
May 2011 Through August 2023 Sampling Events

Sample Location	NYSDEC Class GA Ambient Water Quality Standards [1]	MW-3																MW-3A
Well Depth (feet)		53.9																55
Sampling Date:		5/26/2011		8/23/2012		11/14/2013		3/18/2015		5/11/2016		9/13/2017		11/14/2018		12/9/2019		8/28/2023
Sample Type:		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Target Analyte List Metals by USEPA Method 6010 in ug/L																		
Aluminum	NS	346	ND	360	ND	470	ND	1,400	ND	330	ND	240	ND	730	ND	ND	ND	11.7 U
Antimony	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.48 U
Arsenic	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2 U
Barium	1000	19.1 B	18.1 B	28.9 B	27.9 B	ND	ND	ND	ND	ND	ND	ND	ND	65	ND	ND	ND	45.7
Beryllium	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 U
Cadmium	5	**6.6**	4.6 B	3.0 B	2.8 B	4.7	3.5	4.2	2.4	ND	**5.8**	**9.6**	**8.5**	**5.0**	3.8	2.7	ND	1.6 J
Calcium	NS	16,900	16,800	28,600	29,400	29,000	27,000	16,000	16,000	26,000	25,000	23,000	23,000	17,000	16,000	23,000	24,000	34,000
Chromium	50	**59.6**	32.6	**118**	**103**	**140**	**95.0**	**170**	**61.0**	**97.0**	ND	**67.0**	ND	**52.0**	ND	**57.0**	**56.0**	48.4
Cobalt	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.81 J
Copper	200	45.5	11.7 B	14.2 B	6.5 B	ND	ND	ND	ND	ND	ND	ND	ND	58.0	ND	ND	ND	2.0 U
Iron	300	**462**	ND	**414**	45.4 B	**650**	ND	**1,800**	ND	**700**	ND	**350**	ND	**1,000**	ND	**430**	**370**	275
Lead	25	14.1	ND	ND	ND	8.5	ND	18.0	ND	7.2	ND	3.9	ND	12.0	ND	ND	ND	0.42 U
Magnesium	35000	2,710	2,760	5,100	5,180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,480
Manganese	300	11.8 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.2
Mercury	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.091 U
Nickel	100	ND	4.3 B	3.8 B	3.4 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6
Potassium	NS	1,950	1,770	2,560 E	2,480	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,130
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43 U
Sliver	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 U
Sodium	20000	12,400	13,200	**30,800**	**31,000**	**38,000**	**35,000**	**24,000**	**26,000**	**26,000**	**25,000**	**32,000**	**33,000**	**25,000**	**23,000**	**35,000**	**36,000**	**32,700**
Thallium	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 U
Vanadium	NS	1.4 B	ND	1.1 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 U
Zinc	2000	54.9	40.4 B	19.6 B	19.3 B	ND	ND	61.0	ND	ND	ND	ND	ND	ND	63.0	ND	ND	24.8
1,4-Dioxane by Method 8270E SIM ID in ug/l																		
1,4-Dioxane	0.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.072 U

Notes:
(1) 6NYCRR Part 703.5 GA Groundwater Quality Standards (GQS) and Guidance Values (GV) 6/1998
NS - No Standard
ND - Not Detected
B- Estimated Value
Groundwater Contaminant of Concern

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U : Indicates the analyte was analyzed for but not detected.
BOLD values exceed NYSDEC Standards.
BOLD shaded values are Site-related metals that exceed NYSDEC Standards.

Table 2 (Continued)

Groundwater Chemical Analytical Results - MW-4/MWW-4A

Liberty Industrial Finishing Site

May 2011 Through August 2023 Sampling Events

Sample Location	NYSDEC Class GA Ambient Water Quality Standards [1]	MW-4														MW-4A	MW-44A (duplicate)
Well Depth (feet)		53.4														55	55
Sampling Date:		5/26/2011		8/23/2012		11/4/2013		3/18/2015		9/13/2017		11/14/2018		12/9/2019		8/28/2023	
Sample Type:		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	
Target Analyte List Metals by USEPA Method 6010 in ug/L																	
Aluminum	NS	2,560	ND	1,980	1,130	310	ND	2,200	ND	360	ND	1,400	ND	940	330	35.0 J	32.3 J
Antimony	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.48 U	0.48 U
Arsenic	25	4.8 B	ND	6.4 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2 U	1.2 U
Barium	1000	27.1 B	13.2 B	22.8 B	21.6 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40.7	39.7
Beryllium	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 U	0.12 U
Cadmium	5	**54.2**	**19.8**	**28.2**	**27.3**	**26.0**	**21.0**	**20.0**	**11.0**	**95.0**	**80.0**	**98.0**	**83.0**	**47.0**	**46.0**	**90.6**	**89.7**
Calcium	NS	14,200	12,300	18,700	19,600	33,000	30,000	8,400	8,300	24,000	23,000	33,000	29,000	25,000	25,000	37,100	37,400
Chromium	50	**176**	**142**	**74.9**	**58.7**	ND	ND	**53.0**	ND	**110**	**90.0**	**100**	ND	**110**	**85.0**	**99.5**	**100**
Cobalt	NS	3.3 B	2.6 B	0.73 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	1.1 J
Copper	200	ND	43.5	69.7	58.9	ND	ND	60.0	ND	ND	ND	110	56.0	61.0	ND	4.7	4.8
Iron	300	**2,660**	109 B	**2,000**	**1,110**	**320**	ND	**2,200**	ND	**430**	ND	**1,400**	**340**	**1,100**	**380**	263	264
Lead	25	43.2	ND	15.5	9.8 B	ND	ND	22.0	ND	4.3	ND	15.0	3.1	11.0	4.5	0.42 U	0.42 U
Magnesium	35000	1,710	1,270	2,770	2,870	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4,360	4,350
Manganese	300	47.1 B	12.3 B	18.4 B	14.4 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.7	19.9
Mercury	0.7	0.036 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.091 U	0.091 U
Nickel	100	ND	12.8 B	17.5 B	15.8 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38.1	38.2
Potassium	NS	6,600	6,790	2,340 E	2,460	ND	ND	ND	ND	ND	5,000	6,300	5,100	6,600	6,700	6,150	6,230
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52 J	0.57 J
Sliver	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 U	1.3 U
Sodium	20000	**26,100**	**29,100**	13,400	14,400	**21,000**	**21,000**	ND	ND	8,900 J	12,000 J	9,600	8,300	12,000	13,000	**29,400**	**29,800**
Thallium	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 U	0.19 U
Vanadium	NS	7.0 B	1.2 B	4.9 B	3.2 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 U	1.0 U
Zinc	2000	97	109	257	220	160	130	220	97.0	180	140	430	260	240	180	15.6 J	13.9 J
1,4-Dioxane by Method 8270E SIM ID in ug/l																	
1,4-Dioxane	0.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.072 U	0.072 U

Notes:

(1) 6NYCRR Part 703.5 GA Groundwater Quality Standards (GQS) and Guidance Values (GV) 6/1998

NS - No Standard

ND - Not Detected

B- Estimated Value

Groundwater Contaminant of Concern

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

U : Indicates the analyte was analyzed for but not detected.

BOLD values exceed NYSDEC Standards.

BOLD shaded values are Site-related metals that exceed NYSDEC Standards.

Table 2 (Continued)
Groundwater Chemical Analytical Results - MW-7/MW-7A
Liberty Industrial Finishing Site
May 2011 Through August 2023 Sampling Events

Sample Location	NYSDEC Class GA Ambient Water Quality Standards [1]	MW-7				MW-7A
Well Depth (feet)		55				55
Sampling Date:		11/13/2018		12/9/2019		8/28/2023
Sample Type:		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Target Analyte List Metals by USEPA Method 6010 in ug/L						
Aluminum	NS	390	ND	660	250	123
Antimony	3	ND	ND	ND	ND	0.48 U
Arsenic	25	ND	ND	ND	ND	1.2 U
Barium	1000	ND	ND	63	59	69.5
Beryllium	3	ND	ND	ND	ND	0.28 J
Cadmium	5	2.2	ND	2.9	ND	0.77 J
Calcium	NS	13,000	11,000	31,000	31,000	16,700
Chromium	50	ND	ND	ND	ND	1.7 U
Cobalt	NS	ND	ND	ND	ND	0.64 J
Copper	200	ND	ND	ND	ND	2.2 J
Iron	300	ND	ND	**960**	**420**	28.5 J
Lead	25	ND	ND	4.4	ND	0.42 U
Magnesium	35000	ND	ND	ND	ND	3,130
Manganese	300	ND	ND	ND	ND	67.4
Mercury	0.7	ND	ND	ND	ND	0.091 U
Nickel	100	ND	ND	ND	ND	2.3 J
Potassium	NS	ND	ND	ND	ND	2,960
Selenium	10	ND	ND	ND	ND	0.43 U
Sliver	50	ND	ND	ND	ND	1.3 U
Sodium	20000	18,000	16,000	**88,000**	**87,000**	**24,400**
Thallium	0.5	ND	ND	ND	ND	0.19 U
Vanadium	NS	ND	ND	ND	ND	1.0 U
Zinc	2000	ND	ND	ND	ND	15.7 J
1,4-Dioxane by Method 8270E SIM ID in ug/l						
1,4-Dioxane	0.35	-	-	-	-	0.072 U

Notes:

(1) 6NYCRR Part 703.5 GA Groundwater Quality Standards (GQS) and Guidance Values (GV) 6/1998

NS - No Standard

ND - Not Detected

B- Estimated Value

Groundwater Contaminant of Concern

BOLD values exceed NYSDEC Standards.

BOLD shaded values are Site-related metals that exceed NYSDEC Standards.

Table 2 (Continued)
Groundwater Chemical Analytical Results - MW-17/MW-17A
Liberty Industrial Finishing Site
May 2011 Through August 2023 Sampling Events

Sample Location	NYSDEC Class GA Ambient Water Quality Standards [1]	MW-17				MW-17A
Well Depth (feet)		99				100
Sampling Date:		11/13/2018		12/10/2019		8/28/2023
Sample Type:		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Target Analyte List Metals by USEPA Method 6010 in ug/L						
Aluminum	NS	5,700	ND	2,700	290	1,420
Antimony	3	ND	ND	ND	ND	0.48 U
Arsenic	25	2.9	ND	ND	ND	1.2 U
Barium	1000	75	53	210	200	263
Beryllium	3	ND	ND	1.3	ND	**5.3**
Cadmium	5	**25**	3.6	**13**	**11**	1.5 J
Calcium	NS	31,000	32,000	48,000	49,000	19,800
Chromium	50	ND	ND	**55**	ND	2.6 J
Cobalt	NS	2.8	ND	3	ND	2.3 J
Copper	200	ND	ND	ND	ND	8.3
Iron	300	**7,700**	**1,800**	**3,500**	ND	**437**
Lead	25	**49**	3.2	19	ND	0.63 J
Magnesium	35000	ND	ND	5,800	5,700	2,980
Manganese	300	**930**	**940**	**1,100**	**1,100**	**622**
Mercury	0.7	ND	ND	ND	ND	0.091 U
Nickel	100	ND	ND	ND	ND	9.9
Potassium	NS	6,500	6,400	7,300	7,400	5,280
Selenium	10	ND	ND	ND	ND	0.43 U
Sliver	50	ND	ND	ND	ND	1.3 U
Sodium	20000	**23,000**	**24,000**	**27,000**	**27,000**	**26,400**
Thallium	0.5	ND	ND	ND	ND	0.19 U
Vanadium	NS	ND	ND	ND	ND	1.0 U
Zinc	2000	600	260	480	350	61.4
1,4-Dioxane by Method 8270E SIM ID in ug/l						
1,4-Dioxane	0.35	-	-	-	-	0.072 U

Notes:

(1) 6NYCRR Part 703.5 GA Groundwater Quality Standards (GQS) and Guidance Values (GV) 6/1998

NS - No Standard

ND - Not Detected

B- Estimated Value

Groundwater Contaminant of Concern

BOLD values exceed NYSDEC Standards.

BOLD shaded values are Site-related metals that exceed NYSDEC Standards.

TABLE 3
GROUNDWATER CHEMICAL ANALYTICAL RESULTS - PFAS
LIBERTY INDUSTRIAL FINISHING SITE ONSITE WELLS
AUGUST 28, 2023

Client ID	MW-2A			MW-3A			MW-4A			MW-4A			MW-44A (duplicate)			MW-7A			MW-7A			MW-17A			EB0828 (equipment blank)			NYSDEC Class GA Ambient Water Quality Guidance Values
Lab Sample ID	460-287159-1			460-287159-2			460-287159-3			460-287159-3			460-287159-4			460-287159-5			460-287159-5			460-287159-6			460-287159-7			
	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Secondary 1	Q	MDL	Result	Q	MDL	Result	Q	MDL	Secondary 1	Q	MDL	Result	Q	MDL	Result	Q	MDL	
Per and Polyfluoroalkyl Substances (PFAS) in nanograms per liter (ng/l) by Method 1633																												
11Cl-PF3OUdS	1.76	U	1.76	1.73	U	1.73	1.69	U	1.69	-			1.68	U	1.68	1.69	U F1	1.69	-			1.70	U	1.70	1.71	U	1.71	-
3:3 FTCA	1.32	U	1.32	1.30	U	1.30	1.27	U	1.27	-			1.26	U	1.26	1.27	U	1.27	-			1.28	U	1.28	1.28	U	1.28	-
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.32	U	1.32	1.30	U	1.30	1.27	U	1.27	-			1.26	U	1.26	1.27	U	1.27	-			1.28	U	1.28	1.28	U	1.28	-
4:2 FTS	1.49	U	1.49	1.47	U	1.47	1.44	U	1.44	-			1.43	U	1.43	1.44	U	1.44	-			1.45	U	1.45	1.45	U	1.45	-
5:3 FTCA	8.78	U	8.78	8.65	U	8.65	8.47	U	8.47	-			8.39	U	8.39	8.46	U	8.46	-			8.52	U	8.52	8.56	U	8.56	-
6:2 FTS	4.56	J	2.19	2.16	U	2.16	**3.32**	J	2.12	-			2.43	J	2.10	2.12	U	2.12	-			2.13	U	2.13	2.14	U	2.14	-
7:3 FTCA	8.78	U	8.78	8.65	U	8.65	8.47	U	8.47	-			8.39	U	8.39	8.46	U	8.46	-			8.52	U	8.52	8.56	U	8.56	-
8:2 FTS	2.28	U	2.28	2.25	U	2.25	2.20	U	2.20	-			2.18	U	2.18	2.20	U	2.20	-			2.22	U	2.22	2.22	U	2.22	-
9Cl-PF3ONS	0.88	U	0.88	0.87	U	0.87	0.85	U	0.85	-			0.84	U	0.84	0.85	U F1	0.85	-			0.85	U	0.85	0.86	U	0.86	-
HFPO-DA (GenX)	1.76	U	1.76	1.73	U	1.73	1.69	U	1.69	-			1.68	U	1.68	1.69	U	1.69	-			1.70	U	1.70	1.71	U	1.71	-
NEtFOSA	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
NEtFOSAA	0.61	U	0.61	0.61	U	0.61	0.59	U	0.59	-			0.59	U	0.59	0.59	U	0.59	-			0.60	U	0.60	0.60	U	0.60	-
NEtFOSE	4.39	U	4.39	4.33	U	4.33	4.24	U	4.24	20.7	U H	20.7	4.20	U	4.20	4.23	U	4.23	49.3	U H	49.3	4.26	U	4.26	4.28	U	4.28	-
NFDHA	0.88	U	0.88	0.87	U	0.87	0.85	U	0.85	-			0.84	U	0.84	0.85	U	0.85	-			0.85	U	0.85	0.86	U	0.86	-
NMeFOSA	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
NMeFOSAA	1.05	U	1.05	1.04	U	1.04	1.02	U	1.02	-			1.01	U	1.01	1.02	U	1.02	11.8	U H	11.8	1.02	U	1.02	1.03	U	1.03	-
NMeFOSE	4.39	U	4.39	4.33	U	4.33	4.24	U	4.24	-			4.20	U	4.20	4.23	U	4.23	49.3	U H	49.3	4.26	U	4.26	4.28	U	4.28	-
Perfluorobutanesulfonic acid (PFBS)	**3.28**		0.26	**4.66**		0.26	**3.58**		0.25	-			**3.94**		0.25	**24.5**		0.25	-			**4.84**		0.26	0.26	U	0.26	-
Perfluorobutanoic acid (PFBA)	**6.20**	J	1.76	**8.37**		1.73	**15.2**		1.69	-			**15.5**		1.68	**19.6**		1.69	-			**6.05**	J	1.70	1.71	U	1.71	-
Perfluorodecanesulfonic acid (PFDS)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U F1	0.42	4.93	U H	4.93	0.43	U	0.43	0.43	U	0.43	-
Perfluorodecanoic acid (PFDA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
Perfluorododecanesulfonic acid (PFDoS)	0.79	U	0.79	0.78	U	0.78	0.76	U	0.76	-			0.76	U	0.76	0.76	U F1	0.76	8.88	U H	8.88	0.77	U	0.77	0.77	U	0.77	-
Perfluorododecanoic acid (PFDoA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
Perfluoroheptanesulfonic acid (PFHpS)	**0.40**	J	0.35	**0.35**	J	0.35	**1.05**	J	0.34	-			**0.96**	J	0.34	0.34	U F1	0.34	3.94	U H	3.94	0.34	U	0.34	0.34	U	0.34	-
Perfluoroheptanoic acid (PFHpA)	**3.65**		0.46	**3.05**		0.45	**5.52**		0.44	-			**5.36**		0.44	**5.53**		0.44	-			**8.98**		0.44	0.44	U	0.44	-
Perfluorohexanesulfonic acid (PFHxS)	**1.47**	J	0.50	**1.33**	J	0.49	**3.77**		0.48	-			**3.35**		0.48	**31.1**		0.48	-			**1.32**	J	0.49	0.49	U	0.49	-
Perfluorohexanoic acid (PFHxA)	**6.62**		0.44	**4.77**		0.43	**14.7**		0.42	-			**13.9**		0.42	**10.8**		0.42	-			**18.8**		0.43	0.43	U	0.43	-
Perfluorononanesulfonic acid (PFNS)	0.35	U	0.35	0.35	U	0.35	0.34	U	0.34	-			0.34	U	0.34	0.34	U F1	0.34	3.94	U H	3.94	0.34	U	0.34	0.34	U	0.34	-
Perfluorononanoic acid (PFNA)	**0.82**	J	0.44	**0.83**	J	0.43	**1.15**	J	0.42	-			**1.12**	J	0.42	0.42	U	0.42	-			**0.50**	J	0.43	0.43	U	0.43	-
Perfluorooctanesulfonamide (PFOSA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
Perfluorooctanesulfonic acid (PFOS)	**30.4**		0.44	**207**		0.43	**389**		0.42	-			**392**		0.42	**7.27**		0.42	**9.07**	J H	4.93	**4.54**	I	0.43	0.43	U	0.43	2.7
Perfluorooctanoic acid (PFOA)	**10.6**		0.56	**6.48**		0.55	**9.78**		0.54	-			**10.5**		0.54	**10.7**		0.54	-			**17.7**		0.55	0.55	U	0.55	6.7
Perfluoropentanesulfonic acid (PFPeS)	0.44	U	0.44	0.43	U	0.43	**0.66**	J	0.42	-			**0.74**	J	0.42	**0.75**	J	0.42	-			0.43	U	0.43	0.43	U	0.43	-
Perfluoropentanoic acid (PFPeA)	**5.65**		0.88	**4.63**	I	0.87	**14.9**		0.85	-			**14.5**		0.84	**13.7**		0.85	-			**12.7**		0.85	0.86	U	0.86	-
Perfluorotetradecanoic acid (PFTeDA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	4.93	U H	4.93	0.43	U	0.43	0.43	U	0.43	-
Perfluorotridecanoic acid (PFTriA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U F2	0.42	4.93	U H	4.93	0.43	U	0.43	0.43	U	0.43	-
Perfluoroundecanoic acid (PFUnA)	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
PFEESA	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-
PFMBA	0.88	U	0.88	0.87	U	0.87	0.85	U	0.85	-			0.84	U	0.84	0.85	U	0.85	-			0.85	U	0.85	0.86	U	0.86	-
PFMPA	0.44	U	0.44	0.43	U	0.43	0.42	U	0.42	-			0.42	U	0.42	0.42	U	0.42	-			0.43	U	0.43	0.43	U	0.43	-

Notes:

All samples collected August 28, 2023

Bolded concentrations denote detections.

Bolded yellow-highlighted concentrations exceed NYSDEC Class GA Ambient Water Quality Guidance Values.

F1 : MS and/or MSD recovery exceeds control limits.

F2 : MS/MSD RPD exceeds control limits

H : Sample was prepared or analyzed outside of the specified holding time.

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.

U : Indicates the analyte was analyzed for but not detected.

- : Not established or not analyzed.

ATTACHMENT A

WELL SAMPLING FORMS

WELL SAMPLING DATA

Project: 550 Liberty Plaza

Location: 550 Suffolk Ave, Brentwood NY

Well No.: MW-2A

DTW: 47.41'

Total Depth: 55'

Pump Type and Rate: GeoSub Submersible (~1.5 gpm / ~195 Hz)

Notes: Pump on 8:25

TIME (HRS:MINS)	pH	SPECIFIC CONDUCTIVITY (µS)	TEMPERATURE (°F)	TURBIDITY (NTU)
8:27	6.08	456	64.8	29.23
8:30	6.07	467	64.2	24.29
8:33	6.03	326	64.6	19.06
8:35	6.07	358	63.1	13.12
8:37	6.05	361	63.4	10.58

FPM

WELL SAMPLING DATA

Project: 550 Liberty Plaza

Location: 550 Suffolk Ave, Brentwood NY

Well No.: MW-3A

DTW: 47.45'

Total Depth: 55'

Pump Type and Rate: GeoSub Submersible (~1.5 gpm / ~195 Hz)

Notes: Pump on 9:10

TIME (HRS:MINS)	pH	SPECIFIC CONDUCTIVITY (µS)	TEMPERATURE (°F)	TURBIDITY (NTU)
9:12	6.22	434	62.8	19.92
9:15	6.18	413	63.3	15.52
9:18	6.13	411	63.1	11.79
9:20	6.11	410	62.8	8.93

FPM

WELL SAMPLING DATA

Project: 550 Liberty Plaza

Location: 550 Suffolk Ave, Brentwood NY

Well No.: MW-4A

DTW: 47.12'

Total Depth: 55'

Pump Type and Rate: GeoSub Submersible (~1.5 gpm/~195 Hz)

Notes: DUP (MW-44A) Pump on 10:43

TIME (HRS:MINS)	pH	SPECIFIC CONDUCTIVITY (µS)	TEMPERATURE (°F)	TURBIDITY (NTU)
10:45	6.36	422	71.9	120
10:47	6.26	402	63.4	102
10:50	6.24	375	63.1	29.02
10:52	6.21	376	61.9	18.71
10:55	6.22	374	61.7	15.42

FPM

WELL SAMPLING DATA

Project: 550 Liberty Plaza

Location: 550 Suffolk Ave, Brentwood NY

Well No.: MW-7A

DTW: 47.81'

Total Depth: 55'

Pump Type and Rate: GeoSub Submersible (~1.5 gpm / ~197 Hz)

Notes: Pump on 11:35 (* MS/MSD *)

TIME (HRS:MINS)	pH	SPECIFIC CONDUCTIVITY (µS)	TEMPERATURE (°F)	TURBIDITY (NTU)
11:37	5.51	234	63.1	12.13
11:39	5.42	241	61.9	4.28
11:43	5.40	250	61.7	3.41
11:45	5.39	258	60.6	2.12

FPM

WELL SAMPLING DATA

Project: 550 Liberty Plaza

Location: 550 Suffolk Ave, Brentwood NY

Well No.: MW-17A

DTW: 47.96'

Total Depth: 100'

Pump Type and Rate: GeoSub Submersible (~1.5 gpm / ~~195 Hz~~ ~220 Hz)

Notes: Pump on at 12:30

TIME (HRS:MINS)	pH	SPECIFIC CONDUCTIVITY (µS)	TEMPERATURE (°F)	TURBIDITY (NTU)
12:33	6.16	288	65.3	27.59
12:35	6.08	302	63.1	23.29
12:37	5.88	308	61.0	16.20
12:40	5.60	305	62.1	15.15
12:43	5.61	307	62.3	11.14

FPM

ATTACHMENT B

DATA USABILITY SUMMARY REPORTS

FPM

LIBERTY INDUSTRIAL FINISHING SITE, NYSDEC #152108
DATA USABILITY SUMMARY REPORT
August 28, 2023 Groundwater Sampling
Lab Report #460-287163-1

This data usability summary report (DUSR) was prepared in accordance with Appendix 2B of New York State Department of Environmental Conservation (NYSDEC) DER-10 using the entire original laboratory report, including the sample data summary report and the supporting data package. The sampling event included 5 primary environmental groundwater samples and associated quality assurance/quality control (QA/QC) samples collected on August 28, 2023.

Sample Collection

The samples were collected in labeled laboratory-provided sample containers; no issues with sample containers or labeling were reported by the laboratory. All sample collection was conducted under Chain of Custody (COC) procedures.

Field QA/QC samples, including a field blank, a duplicate sample, and a matrix spike/matrix spike duplicate (MS/MSD) sample, were collected to evaluate field sampling methods and laboratory procedures.

Sample Analyses

The samples were transmitted to and analyzed by Eurofins Environmental Testing (Eurofins) at their Edison, NJ laboratory, which is New York State Department of Health-certified for the analyses performed. The samples were prepared and analyzed for Target Analyte List (TAL) metals using Methods 3005A and 6020B, for mercury using Method 7470A, and for 1,4-dioxane using Method 8270E-Selected Ion Mode (SIM). The analytes are appropriate for the intended use of the data and the analytical methods are appropriate for the analyte list. The sample holding times were met and no problems with sample receipt or handling were reported by the laboratory.

QA/QC Results

One field blank sample was collected during sampling event. Field blank samples are prepared by pouring laboratory-provided clean water over or through the sampling equipment and the results are used to evaluate the potential for field contamination to affect the results from the primary environmental samples. The field blank sample was tested for the same analyte groups that the primary samples were tested for. 1,4-dioxane was not detected in the field blank sample. No detections of any metals were noted in the field blank sample except as follows:

- The metals copper, lead, and zinc were detected in the field blank sample. These detections were below applicable regulatory criteria and, in most cases, below the levels of these metals detected in the primary environmental samples. The lab re-analyzed the sample with similar results. These detections likely resulted from contamination that may have been present in the water used for field blank preparation and do not present a concern for any of the Site-related analytes.

Based on these results, field contamination does not appear to present a significant concern for the primary environmental sample results.

A duplicate sample (MW-44A) was collected in the field and prepared and analyzed by the laboratory to evaluate the precision of the laboratory analyses. The results from the parent sample (MW-4A) and the duplicate sample were very similar, indicating that the laboratory data are anticipated to be reasonably precise.

An MS/MSD sample (separate aliquots of a primary environmental sample) was collected in the field and prepared by the lab to evaluate the effect of the matrix on the reliability of the analytical results. Spiking occurs in the laboratory prior to sample preparation and analysis. One MS/MSD sample was included in this sample delivery group and was prepared from the MW-7A primary environmental sample. Based on information provided by the analytical laboratory, no issues were noted with the MS/MSD results and matrix-related effects have not significantly affected the analytical results.

Method blank (MB) batch samples were analyzed by the laboratory to evaluate the potential for cross-contamination associated with the sample preparation and analysis. The MB results did not show concentrations of any analytes above their method detection limits and/or the reporting limits. Based on the MB results, cross-contamination associated with sample preparation and analysis does not appear to present a significant concern.

Laboratory control samples (LCSs) and LCS duplicates (LCSDs) were used by the laboratory to verify the accuracy of the analyses. The LCS and LCSD results were all within established guidelines. Based on these results, the analytical results do not appear to be affected by laboratory-related accuracy issues.

Questions and Responses as per DER-10

1. Is the data package complete as defined under the current requirements for the NYSDEC ASP Category B deliverables?

   The data package is complete under the current requirements for the NYSDEC ASP Category B deliverables.

2. Have all holding times been met?

   All samples were received and analyzed within the EPA-recommended holding times for the analyses performed.

3. Do all the QC data, including blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data, fall within the protocol-required limits and specifications?

   No – Although the majority of QC data were found to fall within the protocol-required limits and specifications, minor exceptions were noted above; however, these exceptions do not appear to affect the data set at levels of concern.

4. Have all the data been generated using established and agreed-upon analytical protocols?

   Yes - the data for TAL metals were generated using Methods 3005A and 6020B, mercury was analyzed using Method 7470A, and 1,4-dioxane was tested using Method 8270E-SIM.

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets

and quality control verification forms?

Yes – a representative number of raw data results were checked against the data summary sheets and quality control verification forms and no issues were noted.

6. Have the correct data qualifiers been used?

Yes – results below the reporting limit and above the method detection limit have been J-qualified and non-detects are U-qualified. No other qualifiers were indicated or applied.

7. Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

Yes – exceedances have been noted in the DUSR and the corresponding QC summary sheets are attached.

Conclusions

The groundwater samples were collected in accordance with the requirements for this project. No field or laboratory conditions occurred that would result in non-valid analytical data other than as noted above. The data appear adequate for their intended purpose.

Attachments

S:\Liberty Industrial\GW Monitoring\2023 Monitoring\DUSR GW Spls 8-2023-Metals.Docx

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Stephanie Davis
FPM Group Limited
640 Johnson Avenue
Suite 101
Bohemia NY 11716

Generated 9/8/2023 10:40 AM

JOB DESCRIPTION

550 Liberty Plaza

JOB NUMBER

460-287163-1

Eurofins Edison
777 New Durham Road
Edison NJ 08817

See page two for job notes and contact information.

CASE NARRATIVE

Client: FPM Group Limited

Project: 550 Liberty Plaza

Report Number: 460-287163-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 8/29/2023 7:00 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM) - ISOTOPE DILUTION - 1,4 DIOXANE
Samples MW-2A (460-287163-1), MW-3A (460-287163-2), MW-4A (460-287163-3), MW-44A (460-287163-4), MW-7A (460-287163-5), MW-17A (460-287163-6) and EB0828 (460-287163-7) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) - Isotope Dilution - 1,4 Dioxane in accordance with EPA SW-846 Method 8270E SIM 1,4Dioxane. The samples were prepared and analyzed on 09/03/2023.

No difficulties were encountered during the 1,4 Dioxane analysis.

All quality control parameters were within the acceptance limits.

METALS - TOTAL (ICP/MS)
Samples MW-2A (460-287163-1), MW-3A (460-287163-2), MW-4A (460-287163-3), MW-44A (460-287163-4), MW-7A (460-287163-5), MW-17A (460-287163-6) and EB0828 (460-287163-7) were analyzed for Metals - Total (ICP/MS) in accordance with EPA SW-846 Method 6020B - Total. The samples were prepared on 09/01/2023 and analyzed on 09/03/2023.

The EB contains copper, lead and zinc greater than the reporting limit (RL). This was confirmed by analysis of the undigested sample bottle, therefore the results are reported: EB0828 (460-287163-7)

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

MERCURY
Samples MW-2A (460-287163-1), MW-3A (460-287163-2), MW-4A (460-287163-3), MW-44A (460-287163-4), MW-7A (460-287163-5), MW-17A (460-287163-6) and EB0828 (460-287163-7) were analyzed for mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 09/06/2023.

No difficulties were encountered during the Hg analysis.

All quality control parameters were within the acceptance limits.

Sample Summary

Client: FPM Group Limited
Project/Site: 550 Liberty Plaza

Job ID: 460-287163-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
460-287163-1	MW-2A	Water	08/28/23 08:45	08/29/23 19:00
460-287163-2	MW-3A	Water	08/28/23 09:25	08/29/23 19:00
460-287163-3	MW-4A	Water	08/28/23 10:55	08/29/23 19:00
460-287163-4	MW-44A	Water	08/28/23 10:57	08/29/23 19:00
460-287163-5	MW-7A	Water	08/28/23 11:50	08/29/23 19:00
460-287163-6	MW-17A	Water	08/28/23 12:45	08/29/23 19:00
460-287163-7	EB0828	Water	08/28/23 13:15	08/29/23 19:00

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

LIBERTY INDUSTRIAL FINISHING SITE, NYSDEC #152108
DATA USABILITY SUMMARY REPORT
August 28, 2023 Groundwater Sampling
Lab Report #460-287159-1

This data usability summary report (DUSR) was prepared in accordance with Appendix 2B of New York State Department of Environmental Conservation (NYSDEC) DER-10 using the entire original laboratory report, including the sample data summary report and the supporting data package. The sampling event included 5 primary environmental groundwater samples and associated quality assurance/quality control (QA/QC) samples collected on August 28, 2023.

Sample Collection

The samples were collected in labeled laboratory-provided sample containers; no issues with sample containers or labeling were reported by the laboratory. All sample collection was conducted under Chain of Custody (COC) procedures.

Field QA/QC samples, including a field blank, a duplicate sample, and a matrix spike/matrix spike duplicate (MS/MSD) sample, were collected to evaluate field sampling methods and laboratory procedures.

Sample Analyses

The samples were transmitted to and analyzed by Eurofins Environmental Testing (Eurofins) at their Edison, NJ laboratory, which is New York State Department of Health-certified for the analyses performed. The samples were prepared and analyzed for the NYSDEC's target list of per- and polyfluoroalkyl substances (PFAS) using the draft Method 1633 – PFAS by LC/MS/MS. The analytes are appropriate for the intended use of the data and the analytical method is appropriate for the analyte list. The sample holding times were met and no problems with sample receipt or handling were reported by the laboratory.

The MW-4A and MW-7A samples were diluted due to the nature of the sample matrix. Elevated reporting limits are provided.

The MW-7A sample was re-prepared outside of preparation holding time due to low isotope dilution analyte (IDA) recovery during initial extraction. Re-analysis of the MW-4 sample was performed outside of the analytical holding time due to low IDA recovery on the initial analysis. The associated results have been flagged.

QA/QC Results

One field (equipment) blank sample was collected during sampling event. Field blank samples are prepared by pouring laboratory-provided clean water over or through the sampling equipment and the results are used to evaluate the potential for field contamination to affect the results from the primary environmental samples. The field blank sample was tested for the same PFAS analytes that the primary samples were tested for. No PFAS compounds were detected in the field blank sample. Based on these results, field contamination does not appear to present a concern for the primary environmental sample results.

A duplicate sample (MW-44A) was collected in the field and prepared and analyzed by the laboratory to evaluate the precision of the laboratory analyses. The PFAS results from the parent

sample (MW-4A) and the duplicate sample were very similar, indicating that the laboratory data are anticipated to be reasonably precise.

An MS/MSD sample (separate aliquots of a primary environmental sample) was collected in the field and prepared by the lab to evaluate the effect of the matrix on the reliability of the analytical results. Spiking occurs in the laboratory prior to sample preparation and analysis. One MS/MSD sample was included in this sample delivery group and was prepared from the MW-7A primary environmental sample. Based on information provided by the analytical laboratory, no issues were noted with the MS/MSD results except as follows:

- Several PFAS analytes failed the recovery criteria low for the MS in batch 280-626764 and PFHpS failed the recovery criteria high. Three PFAS compounds failed the recovery criteria low for the MSD in batch 280-626764 and several analytes exceeded the relative percent difference (RPD) limit. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) and LCS duplicate (LCSD) were within acceptance limits.

Based on these results, matrix-related effects do not appear to have significantly affected the analytical results.

Method blank (MB) batch samples were analyzed by the laboratory to evaluate the potential for cross-contamination associated with the sample preparation and analysis. The MB results did not show concentrations of any PFAS analytes above their method detection limits and/or the reporting limits. Based on the MB results, cross-contamination associated with sample preparation and analysis does not appear to present a concern.

Laboratory control samples (LCSs) and LCS duplicates (LCSDs) were used by the laboratory to verify the accuracy of the analyses. The LCS and LCSD results were all within established guidelines. Based on these results, the analytical results do not appear to be affected by laboratory-related accuracy issues.

IDA recovery was above the method-recommended limit for the MW-2A sample. The associated target analytes were non-detect and, therefore, the data were reported. IDA recovery was below the method-recommended limit for the MW-4A sample. Data quality is not considered to be affected if the signal-to-noise ratio is greater than 10:1, which was achieved for all IDA in the sample. The sample was re-extracted at dilution, which brought the IDA recoveries within limits. Analysis of this extract confirmed the initial results and the initial data are reported.

Analyst judgement was used to identify certain PFAS compounds where the transition mass ratio for the analyte was outside of established ratio limits. Qualitative identification has some level of uncertainty and the associated results are I-qualified.

Questions and Responses as per DER-10

1. Is the data package complete as defined under the current requirements for the NYSDEC ASP Category B deliverables?

   The data package is complete under the current requirements for the NYSDEC ASP Category B deliverables.

2. Have all holding times been met?

   All samples were received and analyzed within the EPA-recommended holding times for the analyses performed, with the exceptions of a very limited number of re-preparations and re-

analyses.

3. Do all the QC data, including blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data, fall within the protocol-required limits and specifications?

   No – Although the majority of QC data were found to fall within the protocol-required limits and specifications, minor exceptions were noted above; however, these exceptions do not appear to affect the data set at levels of concern.

4. Have all the data been generated using established and agreed-upon analytical protocols?

   Yes - the data for PFAS were generated using the draft Method 1633 – PFAS by LC/MS/MS.

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?

   Yes – a representative number of raw data results were checked against the data summary sheets and quality control verification forms and no issues were noted.

6. Have the correct data qualifiers been used?

   Yes – results below the reporting limit and above the method detection limit have been J-qualified, non-detects are U-qualified, results out of holding times are H-qualified, and results from qualitative identifications are I-qualified. No other qualifiers were indicated or applied.

7. Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

   Yes – exceedances have been noted in the DUSR and the corresponding QC summary sheets are attached.

Conclusions

The groundwater samples were collected in accordance with the requirements for this project. No field or laboratory conditions occurred that would result in non-valid analytical data other than as noted above. The data appear adequate for their intended purpose.

Attachments

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Stephanie Davis
FPM Group Limited
640 Johnson Avenue
Suite 101
Bohemia NY 11716

Generated 9/29/2023 5:16 PM

JOB DESCRIPTION

550 Liberty Industrial Plaza

JOB NUMBER

460-287159-1

Eurofins Edison
777 New Durham Road
Edison NJ 08817

See page two for job notes and contact information.

my EOL

Eurofins Edison

Job Notes

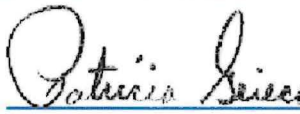
This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northeast, LLC Project Manager.

Compliance Statement

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed within the body of this report. Release of the data contained in this sample data package and in the electronic data deliverable has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Authorization



Generated
9/29/2023 5:16 PM

Authorized for release by
Patricia Grieco, Senior Project Manager
Patricia.Grieco@et.eurofinsus.com
Designee for
Carin A Ferris, Senior Project Manager
carin.ferris@et.eurofinsus.com

CASE NARRATIVE

Client: FPM Group Limited

Project: 550 Liberty Industrial Plaza

Report Number: 460-287159-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 08/29/2023; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.4 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

PFAS
Samples MW-2A (460-287159-1), MW-3A (460-287159-2), MW-4A (460-287159-3), MW-44A (460-287159-4), MW-7A (460-287159-5), MW-17A (460-287159-6) and EB0828 (460-287159-7) were analyzed for PFAS in accordance with EPA 1633. The samples were prepared on 09/19/2023, 09/26/2023 and 09/27/2023 and analyzed on 09/20/2023, 09/27/2023 and 09/28/2023.

Several analytes failed the recovery criteria low for the MS of sample MW-7AMS (460-287159-5) in batch 280-626764. Perfluoroheptanesulfonic acid (PFHpS) failed the recovery criteria high.

11Cl-PF3OUdS, Perfluorodecanesulfonic acid (PFDS) and Perfluorododecanesulfonic acid (PFDoS) failed the recovery criteria low for the MSD of sample MW-7AMSD (460-287159-5) in batch 280-626764. Several analytes exceeded the RPD limit.

11Cl-PF3OUdS, Perfluorodecanesulfonic acid (PFDS) and Perfluorododecanesulfonic acid (PFDoS) failed the recovery criteria low for the MSD of sample MW-7AMSD (460-287159-5) in batch 280-626764. Several analytes exceeded the RPD limit.

The following samples were decanted about 10 mL in order to add spike standards to the sample bottle without the sample overflowing: MW-4A (460-287159-3), MW-44A (460-287159-4), MW-7A (460-287159-5), MW-7A (460-287159-5[MS]), MW-7A (460-287159-5[MSD]), MW-17A (460-287159-6) and EB0828 (460-287159-7). In preparation batch 280-626616 for method 1633_SPE/1633_B24.

In preparation batch 280-627347, the following sample were diluted due to the nature of the sample matrix: MW-4A (460-287159-3) (5x). Elevated reporting limits (RLs) are provided. Because the sample was extracted at a dilution, the original sample container could not be rinsed. Method 1633_SPE/1633_B24.

The following samples were re-prepared outside of preparation holding time due to low IDA recovery during initial extraction: MW-7A (460-287159-5), MW-7A (460-287159-5[MS]) and MW-7A (460-287159-5[MSD]). In preparation batch 280-627539 for method 1633_SPE/1633_B24.
MW-7A (460-287159-5), MW-7A (460-287159-5[MS]) and MW-7A (460-287159-5[MSD])

In preparation batch 280-627539, the following samples were diluted due to the nature of the sample matrix: MW-7A (460-287159-5), MW-7A (460-287159-5[MS]) and MW-7A (460-287159-5[MSD]) (10x/10x/10x). Elevated reporting limits (RLs) are provided. Because the samples were extracted at dilutions, the original sample containers could not be rinsed. Method 1633_SPE/1633_B24.

Refer to the QC report for details.

No other difficulties were encountered during the PFAS analysis.

All other quality control parameters were within the acceptance limits.

PFCS BY LC/MS/MS

Samples MW-2A (460-287159-1), MW-3A (460-287159-2), MW-4A (460-287159-3), MW-44A (460-287159-4), MW-7A (460-287159-5) and MW-17A (460-287159-6) were analyzed for PFCs by LC/MS/MS in accordance with 1633. The samples were analyzed on 09/01/2023 and 09/05/2023.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 280-626616 and analytical batch 280-626764 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: MW-2A (460-287159-1). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. The associated target analytes were non-detections and therefore data has been reported.

The "I" qualifier means the transition mass ratio for the indicated analytes were outside of the established ratio limits. The qualitative identification of the analytes have some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. The affected samples are MW-3A (460-287159-2) and MW-17A (460-287159-6) in analytical batch (280-626764).

The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit: (MB 280-627347/1-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Reanalysis of the following sample was performed outside of the analytical holding time due to low IDA recovery in initial analysis: MW-4A (460-287159-3).

The "I" qualifier means the transition mass ratio for the indicated analytes were outside of the established ratio limits. The qualitative identification of the analytes have some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. The affected samples are MW-7A (460-287159-5) and (LLCS 280-627539/2-A) in analytical batch (280-627697).

The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit: MW-4A (460-287159-3). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample. The sample was re-extracted at dilution, which brought IDA recoveries within limits. Analysis of this extract confirmed results of the initial analysis, and initial data are reported.

No difficulties were encountered during the PFCs by LC/MS/MS analysis.

All quality control parameters were within the acceptance limits.

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 280-626616/2-A
Matrix: Water
Analysis Batch: 626764

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 626616

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
NEtFOSAA	3.20	3.152		ng/L		98	51 - 154
NMeFOSE	32.0	34.15		ng/L		107	56 - 151
NEtFOSE	32.0	34.95		ng/L		109	60 - 147
HFPO-DA (GenX)	12.8	14.55		ng/L		114	58 - 154
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	12.1	13.94		ng/L		115	61 - 148
PFMBA	6.40	6.591		ng/L		103	49 - 154
NFDHA	6.40	8.104		ng/L		127	47 - 160
PFMPA	6.40	6.567		ng/L		103	48 - 150
9Cl-PF3ONS	11.9	12.14		ng/L		102	44 - 167
11Cl-PF3OUdS	12.1	13.00		ng/L		108	36 - 158
PFEESA	5.71	6.482		ng/L		114	56 - 144
3:3 FTCA	16.0	15.50		ng/L		97	32 - 161
5:3 FTCA	80.0	88.87		ng/L		111	39 - 156
7:3 FTCA	80.0	92.67		ng/L		116	36 - 149

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C4 PFBA	*81*		*10 - 130*
13C5 PFPeA	*86*		*35 - 150*
13C5 PFHxA	*79*		*55 - 150*
13C4 PFHpA	*79*		*55 - 150*
13C8 PFOA	*74*		*60 - 140*
13C9 PFNA	*80*		*55 - 140*
13C6 PFDA	*85*		*50 - 140*
13C7 PFUnA	*77*		*30 - 140*
13C2 PFDoA	*77*		*10 - 150*
13C2 PFTeDA	*75*		*10 - 130*
13C3 PFBS	*89*		*55 - 150*
13C3 PFHxS	*81*		*55 - 150*
13C8 PFOS	*84*		*45 - 140*
13C8 FOSA	*75*		*30 - 130*
d3-NMeFOSAA	*81*		*45 - 200*
d5-NEtFOSAA	*83*		*10 - 200*
M2-4:2 FTS	*93*		*60 - 200*
M2-6:2 FTS	*81*		*60 - 200*
M2-8:2 FTS	*85*		*50 - 200*
13C3 HFPO-DA	*80*		*25 - 160*
d7-N-MeFOSE-M	*83*		*10 - 150*
d9-N-EtFOSE-M	*83*		*10 - 150*
d5-NEtPFOSA	*60*		*10 - 130*
d3-NMePFOSA	*58*		*15 - 130*

Lab Sample ID: 460-287159-5 MS
Matrix: Water
Analysis Batch: 626764

Client Sample ID: MW-7A
Prep Type: Total/NA
Prep Batch: 626616

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	19.6		110	139.5		ng/L		109	58 - 148
Perfluoropentanoic acid (PFPeA)	13.7		55.0	68.95		ng/L		100	54 - 152

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 460-287159-5 MS
Matrix: Water
Analysis Batch: 626764

Client Sample ID: MW-7A
Prep Type: Total/NA
Prep Batch: 626616

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	10.8		27.5	40.12		ng/L		107	55 - 152
Perfluoroheptanoic acid (PFHpA)	5.53		27.5	36.97		ng/L		114	54 - 154
Perfluorooctanoic acid (PFOA)	10.7		27.5	41.99		ng/L		114	52 - 161
Perfluorononanoic acid (PFNA)	0.42	U	27.5	29.84		ng/L		108	59 - 149
Perfluorodecanoic acid (PFDA)	0.42	U	27.5	26.97		ng/L		98	52 - 147
Perfluoroundecanoic acid (PFUnA)	0.42	U	27.5	28.69		ng/L		104	48 - 159
Perfluorododecanoic acid (PFDoA)	0.42	U	27.5	29.32		ng/L		107	64 - 142
Perfluorotridecanoic acid (PFTriA)	0.42	U F2	27.5	13.67		ng/L		50	49 - 148
Perfluorotetradecanoic acid (PFTeDA)	0.42	U	27.5	28.87		ng/L		105	47 - 161
Perfluorobutanesulfonic acid (PFBS)	24.5		24.4	50.07		ng/L		105	62 - 144
Perfluoropentanesulfonic acid (PFPeS)	0.75	J	25.8	31.48		ng/L		119	59 - 151
Perfluorohexanesulfonic acid (PFHxS)	31.1		25.1	52.37		ng/L		85	57 - 146
Perfluoroheptanesulfonic acid (PFHpS)	0.34	U F1	26.2	44.70	F1	ng/L		171	55 - 152
Perfluorooctanesulfonic acid (PFOS)	7.27		25.6	37.37		ng/L		118	58 - 149
Perfluorononanesulfonic acid (PFNS)	0.34	U F1 F2	26.5	13.40	F1	ng/L		51	52 - 148
Perfluorodecanesulfonic acid (PFDS)	0.42	U F1 F2	26.5	3.878	F1	ng/L		15	51 - 147
Perfluorododecanesulfonic acid (PFDoS)	0.76	U F1 F2	26.7	1.725	F1	ng/L		6	36 - 145
4:2 FTS	1.44	U	103	122.1		ng/L		119	67 - 146
6:2 FTS	2.12	U	104	115.3		ng/L		110	61 - 151
8:2 FTS	2.20	U	105	127.4		ng/L		121	63 - 152
Perfluorooctanesulfonamide (PFOSA)	0.42	U	27.5	29.88		ng/L		109	61 - 148
NMeFOSA	0.42	U	27.5	34.56		ng/L		126	63 - 145
NEtFOSA	0.42	U	27.5	29.75		ng/L		108	65 - 139
NMeFOSAA	1.02	U	27.5	32.93		ng/L		120	58 - 144
NEtFOSAA	0.59	U	27.5	33.66		ng/L		122	59 - 146
NMeFOSE	4.23	U	275	320.3		ng/L		116	71 - 136
NEtFOSE	4.23	U	275	314.9		ng/L		114	69 - 137
HFPO-DA (GenX)	1.69	U	110	123.8		ng/L		112	63 - 144
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.27	U	104	120.0		ng/L		115	68 - 146
PFMBA	0.85	U	55.0	55.73		ng/L		101	55 - 148
NFDHA	0.85	U	55.0	61.93		ng/L		112	48 - 161
PFMPA	0.42	U	55.0	55.67		ng/L		101	51 - 145
9Cl-PF3ONS	0.85	U F1 F2	103	28.81	F1	ng/L		28	56 - 156
11Cl-PF3OUdS	1.69	U F1 F2	104	2.767	J F1	ng/L		3	46 - 156
PFEESA	0.42	U	49.1	48.61		ng/L		99	56 - 151
3:3 FTCA	1.27	U	138	139.8		ng/L		102	62 - 129
5:3 FTCA	8.46	U	688	733.4		ng/L		107	63 - 134
7:3 FTCA	8.46	U	688	659.8		ng/L		96	50 - 138

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C4 PFBA	82		10 - 130
13C5 PFPeA	79		35 - 150
13C5 PFHxA	77		55 - 150
13C4 PFHpA	71		55 - 150
13C8 PFOA	75		60 - 140
13C9 PFNA	74		55 - 140
13C6 PFDA	64		50 - 140
13C7 PFUnA	37		30 - 140
13C2 PFDoA	16		10 - 150
13C2 PFTeDA	4	*5-	10 - 130
13C3 PFBS	75		55 - 150
13C3 PFHxS	71		55 - 150
13C8 PFOS	44	*5-	45 - 140
13C8 FOSA	58		30 - 130
d3-NMeFOSAA	41	*5-	45 - 200
d5-NEtFOSAA	26		10 - 200
M2-4:2 FTS	82		60 - 200
M2-6:2 FTS	75		60 - 200
M2-8:2 FTS	55		50 - 200
13C3 HFPO-DA	71		25 - 160
d7-N-MeFOSE-M	1	*5-	10 - 150
d9-N-EtFOSE-M	0.3	*5-	10 - 150
d5-NEtPFOSA	19		10 - 130
d3-NMePFOSA	34		15 - 130

Lab Sample ID: 460-287159-5 MSD
Matrix: Water
Analysis Batch: 626764

Client Sample ID: MW-7A
Prep Type: Total/NA
Prep Batch: 626616

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	19.6		110	135.6		ng/L		106	58 - 148	3	30
Perfluoropentanoic acid (PFPeA)	13.7		54.9	68.21		ng/L		99	54 - 152	1	30
Perfluorohexanoic acid (PFHxA)	10.8		27.4	40.53		ng/L		108	55 - 152	1	30
Perfluoroheptanoic acid (PFHpA)	5.53		27.4	35.36		ng/L		109	54 - 154	4	30
Perfluorooctanoic acid (PFOA)	10.7		27.4	40.84		ng/L		110	52 - 161	3	30
Perfluorononanoic acid (PFNA)	0.42	U	27.4	30.47		ng/L		111	59 - 149	2	30
Perfluorodecanoic acid (PFDA)	0.42	U	27.4	27.28		ng/L		99	52 - 147	1	30
Perfluoroundecanoic acid (PFUnA)	0.42	U	27.4	28.83		ng/L		105	48 - 159	1	30
Perfluorododecanoic acid (PFDoA)	0.42	U	27.4	31.27		ng/L		114	64 - 142	6	30
Perfluorotridecanoic acid (PFTriA)	0.42	U F2	27.4	23.67	F2	ng/L		86	49 - 148	54	30
Perfluorotetradecanoic acid (PFTeDA)	0.42	U	27.4	31.97		ng/L		117	47 - 161	10	30
Perfluorobutanesulfonic acid (PFBS)	24.5		24.4	50.22		ng/L		106	62 - 144	0	30
Perfluoropentanesulfonic acid (PFPeS)	0.75	J	25.7	31.40		ng/L		119	59 - 151	0	30
Perfluorohexanesulfonic acid (PFHxS)	31.1		25.0	53.80		ng/L		91	57 - 146	3	30
Perfluoroheptanesulfonic acid (PFHpS)	0.34	U F1	26.1	35.91		ng/L		137	55 - 152	22	30

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 460-287159-5 MSD
Matrix: Water
Analysis Batch: 626764

Client Sample ID: MW-7A
Prep Type: Total/NA
Prep Batch: 626616

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	7.27		25.5	34.19		ng/L		105	58 - 149	9	30
Perfluorononanesulfonic acid (PFNS)	0.34	U F1 F2	26.4	19.87	F2	ng/L		75	52 - 148	39	30
Perfluorodecanesulfonic acid (PFDS)	0.42	U F1 F2	26.4	11.56	F1 F2	ng/L		44	51 - 147	100	30
Perfluorododecanesulfonic acid (PFDoS)	0.76	U F1 F2	26.6	3.240	F1 F2	ng/L		12	36 - 145	61	30
4:2 FTS	1.44	U	102	102.1		ng/L		100	67 - 146	18	30
6:2 FTS	2.12	U	104	111.8		ng/L		107	61 - 151	3	30
8:2 FTS	2.20	U	105	118.1		ng/L		112	63 - 152	8	30
Perfluorooctanesulfonamide (PFOSA)	0.42	U	27.4	31.69		ng/L		116	61 - 148	6	30
NMeFOSA	0.42	U	27.4	34.40		ng/L		125	63 - 145	0	30
NEtFOSA	0.42	U	27.4	32.44		ng/L		118	65 - 139	9	30
NMeFOSAA	1.02	U	27.4	32.83		ng/L		120	58 - 144	0	30
NEtFOSAA	0.59	U	27.4	29.30		ng/L		107	59 - 146	14	30
NMeFOSE	4.23	U	274	301.3		ng/L		110	71 - 136	6	30
NEtFOSE	4.23	U	274	322.9		ng/L		118	69 - 137	2	30
HFPO-DA (GenX)	1.69	U	110	120.6		ng/L		110	63 - 144	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.27	U	104	116.1		ng/L		112	68 - 146	3	30
PFMBA	0.85	U	54.9	55.83		ng/L		102	55 - 148	0	30
NFDHA	0.85	U	54.9	63.30		ng/L		115	48 - 161	2	30
PFMPA	0.42	U	54.9	53.97		ng/L		98	51 - 145	3	30
9Cl-PF3ONS	0.85	U F1 F2	102	62.22	F2	ng/L		61	56 - 156	73	30
11Cl-PF3OUdS	1.69	U F1 F2	103	19.07	F1 F2	ng/L		18	46 - 156	149	30
PFEESA	0.42	U	48.9	51.58		ng/L		105	56 - 151	6	30
3:3 FTCA	1.27	U	137	136.3		ng/L		99	62 - 129	2	30
5:3 FTCA	8.46	U	686	741.8		ng/L		108	63 - 134	1	30
7:3 FTCA	8.46	U	686	688.2		ng/L		100	50 - 138	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFBA	*87*		*10 - 130*
13C5 PFPeA	*83*		*35 - 150*
13C5 PFHxA	*77*		*55 - 150*
13C4 PFHpA	*81*		*55 - 150*
13C8 PFOA	*76*		*60 - 140*
13C9 PFNA	*80*		*55 - 140*
13C6 PFDA	*71*		*50 - 140*
13C7 PFUnA	*53*		*30 - 140*
13C2 PFDoA	*37*		*10 - 150*
13C2 PFTeDA	*14*		*10 - 130*
13C3 PFBS	*82*		*55 - 150*
13C3 PFHxS	*75*		*55 - 150*
13C8 PFOS	*66*		*45 - 140*
13C8 FOSA	*66*		*30 - 130*
d3-NMeFOSAA	*59*		*45 - 200*
d5-NEtFOSAA	*49*		*10 - 200*
M2-4:2 FTS	*99*		*60 - 200*

Method: Draft 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 460-287159-5 MSD
Matrix: Water
Analysis Batch: 626764

Client Sample ID: MW-7A
Prep Type: Total/NA
Prep Batch: 626616

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
M2-6:2 FTS	82		60 - 200
M2-8:2 FTS	66		50 - 200
13C3 HFPO-DA	76		25 - 160
d7-N-MeFOSE-M	14		10 - 150
d9-N-EtFOSE-M	5	*5-	10 - 150
d5-NEtPFOSA	40		10 - 130
d3-NMePFOSA	50		15 - 130

Lab Sample ID: MB 280-627347/1-A
Matrix: Water
Analysis Batch: 627536

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 627347

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.00	U	8.00	2.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluoropentanoic acid (PFPeA)	1.00	U	4.00	1.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorohexanoic acid (PFHxA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluoroheptanoic acid (PFHpA)	0.52	U	2.00	0.52	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorooctanoic acid (PFOA)	0.64	U	2.00	0.64	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorononanoic acid (PFNA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorodecanoic acid (PFDA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluoroundecanoic acid (PFUnA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorododecanoic acid (PFDoA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorotridecanoic acid (PFTriA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorotetradecanoic acid (PFTeDA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorobutanesulfonic acid (PFBS)	0.30	U	2.00	0.30	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluoropentanesulfonic acid (PFPeS)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorohexanesulfonic acid (PFHxS)	0.57	U	2.00	0.57	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluoroheptanesulfonic acid (PFHpS)	0.40	U	2.00	0.40	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorooctanesulfonic acid (PFOS)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorononanesulfonic acid (PFNS)	0.40	U	2.00	0.40	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorodecanesulfonic acid (PFDS)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorododecanesulfonic acid (PFDoS)	0.90	U	2.00	0.90	ng/L		09/26/23 09:28	09/27/23 12:19	1
4:2 FTS	1.70	U	8.00	1.70	ng/L		09/26/23 09:28	09/27/23 12:19	1
6:2 FTS	2.50	U	8.00	2.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
8:2 FTS	2.60	U	8.00	2.60	ng/L		09/26/23 09:28	09/27/23 12:19	1
Perfluorooctanesulfonamide (PFOSA)	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
NMeFOSA	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
NEtFOSA	0.50	U	2.00	0.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
NMeFOSAA	1.20	U	4.00	1.20	ng/L		09/26/23 09:28	09/27/23 12:19	1
NEtFOSAA	0.70	U	2.00	0.70	ng/L		09/26/23 09:28	09/27/23 12:19	1
NMeFOSE	5.00	U	20.0	5.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
NEtFOSE	5.00	U	20.0	5.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
HFPO-DA (GenX)	2.00	U	8.00	2.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.50	U	8.00	1.50	ng/L		09/26/23 09:28	09/27/23 12:19	1
PFMBA	1.00	U	4.00	1.00	ng/L		09/26/23 09:28	09/27/23 12:19	1
NFDHA	1.00	U	4.00	1.00	ng/L		09/26/23 09:28	09/27/23 12:19	1