

**NHDES Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095**

**April 2023 Tri-Annual
Water Quality Monitoring Results
North Country Environmental Services, Inc. Landfill
581 Trudeau Road
Bethlehem, New Hampshire 03574**

**NHDES Site #: 198704033
Project Type: Water Quality Monitoring
Project Number: 1737**

Prepared For:
North Country Environmental Services, Inc. (NCES)
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Date of Report: May 31, 2023

**Sanborn,
Head &
Associates,
Inc.**
Digitally signed
by Sanborn, Head
& Associates, Inc.
Date: 2023.05.31
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Groundwater Monitoring Report Cover Sheet

Site Name: **North Country Environmental Services, Inc. (NCES) Landfill**

Town: **Bethlehem, NH**

Permit #: **GWP-198704033-B-007**

Type of Submittal (*Check all that apply*)

Periodic Summary Report (*year*):

Data Submittal (*month and year per Condition #7 of Permit*): **April 2023**

Check each box where the answer to any of the following questions is "YES"

Sampling Results

During the most recent monitoring event, were any **new** compounds detected at any sampling point?

Well/Compound:

B-919U: arsenic

Are there any detections of contamination in drinking water that is untreated prior to use? **NO**

Well/Compound:

Do compounds detected exceed AGQS?

Was free product detected for the **first time** in any monitoring point? **NO**

Surface Water (*visible sheen*)

Groundwater (*1/8" or greater thickness*)

Location/Thickness:

Contaminant Trends

Do sampling results show an increasing concentration trend in any source area monitoring well? **Concentration trends are discussed in the text.**

Well/Compound:

Do sampling results indicate an AGQS violation in any of the GMZ boundary wells?

AGQS exceedances at monitoring wells for April 2023 are indicated below and are discussed in the report text.

Well/Compound:

Arsenic: B-919M, MW-801, MW-802, MW-803 [inside GMZ]

Manganese: B-103S, B-103D, B-304DR, MW-801, MW-802, MW-803, B-919M [inside GMZ]; B-926U, MW-701 [outside GMZ]

1,4-Dioxane: B-304DR [inside GMZ]
PFOA: B-918M [outside GMZ]

Recommendations

- Does the report include any recommendations requiring DES action? (*Do not check this box if the only recommendation is to continue with existing permit conditions.*) **NO**

Mr. James W. O'Rourke, P.G.
New Hampshire Department of Environmental Services
Waste Management Division
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

May 31, 2023
File No. 2637.10

Re: April 2023 Water Quality Monitoring Results
Groundwater Management and Release Detection Permit GWP-198704033-B-007
North Country Environmental Services, Inc. (NCES) Landfill
Bethlehem, New Hampshire

Dear Mr. O'Rourke:

On behalf of NCES, Sanborn, Head & Associates, Inc. (Sanborn Head) performed groundwater and surface water quality sampling at the NCES Landfill (Site) on April 18 and 19, 2023. Sanborn Head collected groundwater and surface water samples from the locations required by the Site Groundwater Management and Release Detection Permit GWP-198704033-B-007 (the "Permit"), issued by New Hampshire Department of Environmental Services (NHDES) on April 12, 2018, and revised on October 19, 2018. Sanborn Head submitted a Permit renewal application on April 4, 2023, ahead of the Permit expiring on April 11, 2023, and then submitted a revised Permit application on April 18, 2023 to address NHDES's preliminary comments. The revised Permit application is pending with NHDES.

The Permit and Supplemental Site Investigation (SSI) locations specified for the April 2023 sampling round included: 29 groundwater monitoring wells (five of which were sampled in March as part of Stage VI replacement well comparison [see discussion below]), two seeps/springs on the slope between the Site and the Ammonoosuc River, and water level measurements (only) at 20 groundwater monitoring wells, as summarized in Exhibit 1 (following page). We note that the B-928 wells (installed in September 2021 as part of the SSI) were sampled as part of April 2023 monitoring round.

Five Permit locations specified for the April 2023 sampling round were sampled in March 2023 as part of the Stage VI Phase II replacement monitoring well sampling Round 2 of 2. These five locations (B-102S, B-102D, B-903U, B-904U, and B-914U) were not resampled in April 2023 (except for B-914U which was resampled in April for a partial list of analytes), but their March 2023 results are included in this report. The results from the Stage VI Phase II Replacement Monitoring Well Information Round 2 of 2 were reported to NHDES in a separate transmittal on May 8, 2023¹.

¹ <https://www4.des.state.nh.us/DocViewer/?ContentId=5081235>

A Site Features Plan is provided as Figure 1. A Groundwater Elevation Contour Plan is provided as Figure 2. An evaluation of background groundwater exceedances is provided as Table 1. A summary of sitewide background conditions is included in Appendix A. A summary of historical monitoring data is included in Appendix B. Time series plots of groundwater analytical parameters are included in Appendix C. PFAS groundwater analytical results are provided as Appendix D. Field Sampling Summary forms are provided as Appendix E. Analytical Data Reports are included in Appendix F. Drought information is included in Appendix G.

Consistent with the Permit, the analytical results for the April 2023 monitoring round are summarized below. In addition to transmitting the April data, this letter provides: 1) comparison of April 2023 analytical monitoring results to sitewide background values, 2) comparison to applicable standards, and 3) a general assessment of water quality trends for the Permit-required analytes.

**Exhibit 1
Summary of Permit Monitoring Locations – April 2023**

Groundwater Management Wells/Other					
100-Series	B-102S [#]	B-102D [#]	B-103S	B-103D	
Other	MW-604 *				
Release Detection Wells					
800-Series	MW-801	MW-802	MW-803		
900-Series	B-903U [#]	B-903L*	B-904U [#]	B-904L*	B-914U [#]
	B-914L*	B-915U	B-915M	B-915D*	B-916U
	B-916M	B-916D*	B-917U	B-909	B-917D*
	B-918U	B-918M	B-918D*	B-919U	B-919M
	B-919D*	B-923U*	B-924U	B-924L*	B-925U*
	B-925L*	B-926U	B-926L	B-927U	B-927M
	B-927L*	Non-Permit SSI wells: B-928U and B-928D			
900-Series	Non-Permit Stage VI Phase II Replacement Monitoring Wells: B-931U*, B-931L*, B-930U*, B-930L*, B-929U*, B-929L*				
Other	B-304UR	B-304DR	MW-603	MW-701	

Notes:

1. This table reflects the Permit revision issued by NHDES on October 19, 2018.
2. Paired “couplet” monitoring well installations include a shallow or upper well (designated S or U) and a deeper or lower well (designated D or L). At triplet well cluster locations, monitoring wells were installed as upper, lower, and mid-level (designated M).
3. “*” indicates water level measurement only for the most recent April 2023 tri-annual monitoring; no sample was collected for field screening parameters or laboratory analysis.
4. “#” indicates Permit-required sample was collected in March 2023 as part of the Stage VI Phase II Replacement Monitoring Well sampling, and not repeated in April except for filtered (dissolved) SVOCs at B-914U).

Surface Water Sampling Locations
Springs/Seeps
S-1 (Main Seep)
SF-1 (surface flow down slope from S-1)



Field parameters pH, specific conductance, temperature, and turbidity (at the two locations sampled for PFAS [MW-701 and B-918M] and B-914U) were measured at the time of sample collection. Groundwater samples were placed into laboratory containers and transported to Eastern Analytical, Inc. (EAI) of Concord, New Hampshire in coolers with ice under standard chain-of-custody procedures.

SUMMARY OF BACKGROUND GROUNDWATER CONCENTRATION EXCEEDANCES

This section compares groundwater analytical results of the April 2023 sampling event to the identified background concentrations, consistent with Env-Or 702.03.

Background concentrations, including calculation methods, are described in Appendix A. Refer to Table A.1 for historical data used to identify background values. A summary of background groundwater exceedances is included as Table 1. Refer to Appendix B.2 for recent groundwater analytical data and applicable standards for groundwater.

Detected concentrations exceeding background values for the first time at a monitoring location in March/April 2023 are summarized in Exhibit 2. Other detected concentrations were either below background concentrations or have previously exceeded background concentrations in the period of record for a given location. Other initial background concentration exceedances detected in March as part of replacement well sampling were previously reported to NHDES.

**Exhibit 2
Summary of Initial Background Concentration Exceedances – March/April 2023**

Location	Analyte	Concentration / Value	Previous Max or Min	April 2023 Site Background (refer to Table 1)	GW-1 (AGQS)	SM CL	# of sampling events for analyte
Background Wells							
No initial exceedances of background							
Release Detection Wells Inside the GMZ– Impacts Anticipated from Former Unlined Landfill							
B-919U	Arsenic, Dissolved	0.00056 mg/L	<0.0005 mg/L	0.00051 mg/L	0.005 mg/L	NS	45
	Comments: The April 2023 results for arsenic did not exceed the AGQS. We also note that the Site Background concentration for arsenic decreased from 0.0011 in November 2022 to 0.00051 mg/L in April 2023. VOCs were not detected at B-919U in April 2023. Given the general absence of other potential leachate indicators, including more soluble analytes, the data are not consistent with a new release.						
B-102S	Perfluorooctanoic Acid (PFOA)	4.24 ng/L	N/A	<4.0-<5.0 ng/L	12 ng/l	NS	3
	Comments: Note that this sample was collected in March 2023. The initial PFOA detection at B-102S also represented a background concentration exceedance at this location. The March 2023 sampling round was only the second sampling round for PFOA at B-102S. VOCs were not detected at B-102S in December 2022 or March 2023. Given the general absence of other potential leachate indicators, including more soluble analytes, the data are not consistent with a new release.						



Location	Analyte	Concentration / Value	Previous Max or Min	April 2023 Site Background (refer to Table 1)	GW-1 (AGQS)	SM CL	# of sampling events for analyte
B-914U	As discussed in the Stage VI Phase II Replacement Monitoring Well Information Round 2 of 2 transmittal, the March 2023 results for B-914U indicated initial background concentration exceedances for 16 SVOC analytes. The B-914U sample in March 2023 was noted as turbid. A filtered SVOC sample was collected from B-914U in April 2023 for comparison to the unfiltered results from March 2023 and SVOCs were not detected from the filtered sample at B-914U in April 2023. Given the general absence of other potential leachate indicators, including more soluble analytes, the data are not consistent with a new release.						
Groundwater Management Wells Inside the GMZ – Impacts Anticipated from Former Unlined Landfill							
No initial exceedances of background							

SUMMARY OF INITIAL DETECTS

This section summarizes analytes detected for the first time in March/April 2023 at a location in its respective period of record. As summarized in Exhibit 3 below, dissolved arsenic was initially detected B-919U at a concentration above site background but below the AGQS, and PFOA was initially detected at B-102S at a concentration above site background but below the AGQS. Other initial detections from replacement well sampling in March were previously reported to NHDES.

**Exhibit 3
Summary of Initial Detects at Groundwater
Monitoring Locations – March/April 2023**

Location	Analyte	milligrams per liter (mg/l)			
		NHDES AGQS	Site Background	March/April 2023 Concentration	Laboratory Reporting Limit
B-919U	Arsenic, Dissolved	0.005 mg/L	0.00051 mg/L	0.00056 mg/L	0.0005
B-102S	PFOA	12 ng/L	<4.0-<5.0 ng/L	4.24 ng/L	4 ng/l

Notes:
 "GW-1" Groundwater Standards are from the New Hampshire Department of Environmental Services (NHDES) Contaminated Sites Risk Characterization and Management Policy (RCMP) (January 1998, with 2000 through 2018 revisions/addenda). GW-1 Groundwater Standards are intended to be equivalent to the AGQSs promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). For analytes where GW-1 and AGQS values differ, the values presented in this table reflect the AGQSs in the latest Env-Or 600 update. The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water.
 SMCLs are not established for the above-listed analytes
 The sample from B-102S was collected in March 2023 and the results were previously reported to NHDES.

SUMMARY OF GROUNDWATER QUALITY EXCEEDANCES

Detected concentrations in groundwater in March/April 2023 which exceeded applicable standards are indicated on Table 1 and in Appendix B.2, and summarized in Exhibit 4 below. Concentrations were compared to the GW-1/AGQS; if no GW-1/AGQS is available for an



analyte, then concentrations were compared to the USEPA SMCLs², if available. Other exceedances of AGQS or SMCL detected in March as part of replacement well sampling were previously reported to NHDES.

**Exhibit 4
Summary of Exceedances of AGQS or SMCL – March/April 2023**

Analyte	AGQS (or SMCL if no AGQS)	Exceedance in March/April 2023		Initial Exceedance March/April 2023	
		Within GMZ	Outside GMZ	Within GMZ	Outside GMZ
AGQS Exceedance					
Manganese	0.30 mg/L	B-102S, B-102D, B-103S, B-103D, B-304DR, MW-801, MW-802, MW-803, B-919M	B-926U, MW-701	None	None
Arsenic	0.005 mg/L	B-102D, B-919M, MW-801, MW-802, MW-803	None	None	None
1,4-Dioxane	0.32 µg/L	B-304DR	None	None	None
PFOA	12 ng/L	None	B-918M	None	None
<p>As discussed in Stage VI Phase II Replacement Monitoring Well Information Round 2 of 2 transmittal, the March 2023 results for B-914U indicated initial AGQS exceedances for benzo(a)anthracene and benzo(a)pyrene. The B-914U sample in March 2023 was noted as turbid. A filtered SVOC sample was collected from B-914U in April 2023 for comparison to the unfiltered results from March 2023 and SVOC analytes were not detected from the filtered sample at B-914U in April 2023. Given the general absence of other potential leachate indicators, including more soluble analytes, the data are not consistent with a new release.</p>					
SMCL Exceedance (analytes with no AGQS)					
pH ¹	6.5 to 8.5 s.u.	MW-802, MW-803	B-915M, B-916U, B-916M, B-918U, B-926U, B-926L, B-927U, MW-701	None	None
Iron	0.3 mg/L	B-102D, B-103S, B-103D, MW-801, MW-802, MW-803, B-919M	B-927M	None	None
<p>Notes:</p> <ol style="list-style-type: none"> The samples from B-102S and B-102D were collected in March 2023. The SMCL for pH is a range from 6.5 to 8.5 s.u. Locations indicated as outside the SMCL range for pH indicated values below 6.5 s.u. “Initial exceedance” indicates that April 2023 was the first time the AGQS or SMCL was exceeded in a sample collected from a given location in the respective period of record. Period of record varies by location. <p>mg/l = milligrams per liter µg/l = micrograms per liter ng/l = nanograms per liter</p>					

² The SMCLs are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These analytes are not considered by USEPA to present a risk to human health at the SMCL.



GROUNDWATER QUALITY TREND ASSESSMENT

This section provides a comparison to background values, an assessment of trends for analytes with first-time background exceedances, and an assessment of trends for analytes with exceedances of standards for March/April 2023 results. Refer to Tables 1, B.2, and D.1 for analytical data summaries. Time series plots are included in Appendix C. A discussion of groundwater quality trends for other wells sampled in March as part of replacement well sampling was previously provided to NHDES.

Volatile Organic Compounds (VOCs)

Only two VOCs were detected in groundwater in April 2023:

- **1,4: Dioxane:** was detected at two locations (Permit well B-304DR, and SSI well B-928D) at concentrations of 0.5 µg/l (B-304DR; 0.5 µg/l in the duplicate) and 0.26 µg/L (B-928D). The concentration at B-304DR in April 2023 was slightly higher than the concentration recorded in November 2022 (0.43 µg/l primary, 0.41 µg/l duplicate) and the AGQS of 0.32 µg/l, but at the lower range of concentrations recorded at this location since November 2019 (the first sampling event following the summer 2019 earthwork), which ranged from 0.32 to 2.9 µg/l.

The 1,4-dioxane concentration detected at B-928D in April 2023 (0.26 µg/l) was below the AGQS, and the lowest value recorded at B-928D since sampling began in September 2021. The 1,4-dioxane concentrations at B-928D were generally consistent with downgradient migration/attenuation of concentrations recorded at B-304DR.

- **Dichlorodifluoromethane (DCDFM; Freon 12):** was detected at two locations at concentrations well below the AGQS (1,000 µg/l). The concentration at B-927M (13 µg/L) was within the range of historical results at this well, which have ranged from 7 to 21 µg/l since this well was first sampled in November 2017. DCDFM was also detected at B-304DR at a concentration of 2.1 µg/l (2.2 µg/l duplicate). The result at B-304DR is below both the more recent February 2021 high concentration (9.4 µg/l), and historical maximum detection at this location (22 µg/l in April 2016).

Inorganic Parameters

Note: As indicated in previous transmittals, several metals (principally iron, arsenic, and manganese) are naturally occurring in soil at the Site, and elevated concentrations of these metals have been detected in groundwater generally at locations downgradient of the former unlined landfill, which generally have reducing conditions. Therefore, locations within and adjacent to the GMZ are anticipated to typically exhibit higher metals concentrations in groundwater than other areas of the site. As discussed in previous reports, iron, manganese, and/or arsenic have shown variable, but in some cases overall increasing concentration trends for recent reporting periods at within the GMZ (i.e., manganese at B-304DR), which are inferred to be related to the persistent reducing conditions associated with the former unlined landfill. Manganese concentrations at MW-701 (outside the GMZ) have been variable in recent years but were above the GW-1/AGQS in April, July, and November 2021, January, July, and November 2022, and January and April 2023, and have typically been above the current site background (0.19 mg/l) since early 2017.



A summary of inorganic parameters is provided below.

Metals

- **Arsenic:** Exceedances of the arsenic site background concentration (0.00051 mg/l) in March/April 2023 were limited to six wells within the GMZ (MW-801, MW-802, MW-803, B-102D, B-919M and B-919U) at concentrations ranging from 0.00056 mg/l (B-919U) to 0.071 mg/l (MW-803 duplicate; 0.07 mg/l in the primary) and one well adjacent to the GMZ (B-914U; 0.0013 mg/l). Arsenic concentrations at wells inside the GMZ and B-914U in March/April 2023 were within the range of recent concentrations, except for B-919U. The detection of arsenic at B-919U represented an initial detection and an initial background exceedance of arsenic. Elevated arsenic concentrations inside the GMZ are consistent with reducing conditions associated with the former unlined landfill. Each of these background exceedances also represents an exceedance of the arsenic AGQS of 0.005 mg/l, except for B-919U.

Note the arsenic background concentration reduced from 0.0011 mg/l in November 2022 to 0.00051 mg/l in April 2023 based on the results from background wells.

- **Manganese:** Exceedances of the manganese site background concentration (0.19 mg/l) in March/April 2023 were indicated at nine locations inside the GMZ (MW-801, MW-802, MW-803, B-919M, B-304DR, B-102S, B-102D, B-103S, and B-103D) and three locations outside the GMZ (B-926U, B-927M, and MW-701). Concentrations at the wells inside the GMZ ranged from 1.1 mg/l (B-103D) to 6.7 mg/l (MW-803 in the duplicate; 6.5 mg/l in the primary). Concentrations at wells outside the GMZ ranged from 0.26 mg/l (B-927M) to 3.1 mg/l (B-926U). Manganese concentrations at these monitoring wells in March/April 2023 were within the range of recent concentrations, with the exception of the concentrations at B-927M and MW-701, which each represented period of records max at their respective locations, although not initial background exceedances. Each of these background exceedances also represented an exceedance of the manganese AGQS of 0.3 mg/l, except for B-927M.
- **Iron:** Exceedances of the iron site background concentration (0.64 mg/l) were limited to seven wells inside the GMZ (MW-801, MW-802, MW-803, B-919M, B-102D, B-103S and B-103D) and one well outside the GMZ (B-927M). Concentrations at the wells inside the GMZ ranged from 4.2 mg/l (B-103D) to 56 mg/l (MW-803 duplicate; 54 mg/l in the primary). The concentration at the well outside the GMZ was 3.3 mg/l (B-927M). Iron concentrations at these monitoring wells in March/April 2023 were within the range of recent concentrations. Each of these background exceedances also represented an exceedance of the iron SMCL of 0.3 mg/l.

Bromide

The bromide background concentration inside the GMZ (0.4 mg/l) was not exceeded in March/April 2023. Exceedances of the bromide background concentration outside of the GMZ (0.1 mg/l) in March/April 2023 were limited to B-918U and B-926U, at concentrations of 0.13



mg/l and 0.2 mg/l, respectively. The result at B-918U represented the first detection of bromide since September 2012, and the result at B-926U was the highest concentration recorded since April 2018 (0.22 mg/l); however, the April 2023 bromide results were within the range of concentrations recorded at these locations.

Chloride

As indicated on Table 1 and discussed in Appendix A.1, locations indicating exceedances of the chloride background concentration [1.8 mg/l] (and sometimes also specific conductance) are typically one of two categories, discussed below. Note the chloride background concentration reduced from 4 mg/l in November 2022 to 1.8 mg/l in April 2023 based on the results from background wells.

- Shallow locations near roadways or downgradient of roadways are inferred to be in part or in whole related to vehicle traffic and associated soil disturbance. Deeper intervals may also indicate elevated chloride concentrations within the GMZ (e.g., B-304DR). A list of locations is below:

Outside the GMZ	B-915U, B-916U, B-918U, B-926U, B-927U, MW-701, MW-603
Inside the GMZ	B-103S, B-103D, B-304UR, B-304DR, MW-801, MW-802, MW-803, B-919U, B-919M, SSI wells B-928U and B-928D [downgradient of the B-304 pair]

Chloride concentrations at these locations in April 2023 ranged from 2 mg/l (B-103D) to 54 mg/l (B-927U) and were generally within the range of recent results, with the exception of B-918U, at which the chloride concentration (46 mg/l) represented a period of record max.

- Periodically or consistently elevated chloride (and sometimes also specific conductance) are noted at intermediate and deep wells outside the GMZ, and generally northwest of the landfill. These intermediate and deep wells occasionally indicate the presence of anthropogenic influence (e.g., sporadic detection of VOCs presumed to be related to earthwork associated with previous phases of landfill development) and are inferred to be completed in groundwater intervals representative of longer flow paths/travel times. As such, results from these monitoring wells are inferred to be representative of historical conditions which may no longer exist at the site.

- B-915M
- B-916M
- B-918M
- B-926L
- B-927M

Chloride concentrations at these locations in April 2023 ranged from 3.6 mg/l (B-927M) to 65 mg/l (B-915M) and are generally within the range of recent results.



Nitrate

One location outside the GMZ exceeded the nitrate background concentration (2.5 mg/l) in April 2023: B-918U (4.1 mg/l).

Total Kjeldahl Nitrogen (TKN)

One location inside the GMZ exceeded the TKN background (0.92 mg/l) in April 2023: MW-803 (1.8 mg/l in the primary; 1.7 mg/l in the duplicate).

Sulfate

Sulfate was required by NHDES in the October 21, 2019 letter³, to be analyzed in the MW-701 and B-918M samples. The sulfate results from MW-701 (17 mg/l) and B-918M (13 mg/l) in April 2023 were generally consistent with previous results and were well below the GW-1/AGQS (500 mg/l). Because analysis for sulfate is not required in the Permit, a background value has not been established for this parameter.

Chemical Oxygen Demand (COD)

The COD background concentration (15 mg/l) was exceeded at three locations in March/April 2023 monitoring including B-914U (45 mg/l), B-927M (48 mg/l), and MW-803 (78 mg/l in the duplicate and the primary). COD was not detected in the repeat groundwater sample collected from B-914U in April 2023. The detection at B-927M was within the range of concentrations recorded at this location in the last several years. Beginning in approximately 2016, COD at MW-803 has typically fluctuated but concentrations have indicated general overall increases since that time. The concentration at MW-803 in April 2023 represents a period of record max at this location, increased slightly from the previous max of 77 mg/l recorded in May 2021.

Note the COD background concentration reduced from 20 mg/l in November 2022 to 15 mg/l in April 2023 based on the results from background wells.

Per- and Polyfluoroalkyl Substances (PFAS)

Samples for PFAS analysis were collected from 10 Permit monitoring wells at the site in March/April 2023 including B-903L, B-903U, B-904L, B-904U, B-914L, B-914U, B-102S and B-102D, for which the samples were collected in March 2023, and MW-701 and B-918M for which the samples were collected in April. A discussion of the March results was previously provided to the NHDES. PFOA was detected at 4 of the 10 sampling locations (B-102S, MW-701, B-914L, and B-918M) at concentrations ranging from 4.24 ng/l (B-102S) to 19.4 ng/l (B-914L).

PFOA concentrations exceeded the AGQS (12 ng/l) at B-914L in March 2023 (previously reported) and at B-918M in April 2023. PFOS was detected in April 2023 at only two locations: B-918M at 5.35 ng/l, and MW-701 at 5.91 ng/l, both below the AGQS of 15 ng/l. PFHxS was detected at one location: B-102S at a concentration of 4.82 ng/l, below the above the AGQS of 18 ng/l. PFNA was not detected in March/April 2023 sampling. Concentrations of PFOS, PFHxS

³ October 21, 2019 Letter from Mr. James O'Rourke (NHDES) to Mr. John Gay (NCES): "July 2019 Tri-Annual/2019 Annual Water Quality Monitoring Results, prepared by Sanborn, Head & Associates, Inc., and dated August 22, 2019"; and "August 2019 PFAS Groundwater Results Data Transmittal, prepared by Sanborn, Head & Associates, Inc., and dated September 3, 2019". <https://www4.des.state.nh.us/IIProxy/IIProxy.dll?ContentId=4813101>



and PFNA in April 2023 were within the range of previous detected concentrations; as previously reported, the concentration of PFOA at B-102S represented an initial detection and initial exceedance of background in March 2023, but it did not exceed the AGQS.

One or more non-regulated PFAS analytes were detected at 4 of the 10 Permit monitoring wells sampled for PFAS at the site in March/April 2023 (B-102S, MW-701, B-914L, and B-918M). Detections of non-regulated PFAS were limited to five analytes: PFBA, PFPeA, PFHxA, PFHpA, and PFBS.

SURFACE WATER QUALITY RESULTS

In April 2023, VOCs were not detected in surface water samples (Main Seep [S-1] and SF-1), and results for other analytes were within the range of values recorded in the last several years (refer to Table B.3 and Appendix C.2).

EVALUATION OF DROUGHT CONDITIONS

Data from the U.S. Drought Monitor and USGS Ammonoosuc River gage were reviewed to provide a context for the hydrologic conditions at the time of April 2023 sampling (refer to Appendix G).

Beginning in late June 2022 and through late September 100% of Grafton county was classified as abnormally dry. During this time, two intervals were recorded when between 15 and 100% of the county was classified to be in moderate drought. The dry conditions attenuated briefly in late September, but from October through early January, conditions in approximately 30 to 50% of the county were rated abnormally dry. These dry conditions eased in mid-January, and from mid-January through April, including when the samples discussed herein were collected, no drought conditions were noted in the county.

USGS Ammonoosuc River gage data indicated that average daily flows in the Ammonoosuc River at the time of sample collection in mid-April were at the higher end of the range of flows recorded in the previous five years. Flows were generally at the low end of values from late February through early April 2023. Beginning in mid-April 2023 and continuing into early May, flows increased to be near the higher end of flows recorded in the last five years.

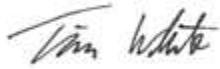
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We trust that this report satisfies NHDES' requirements for the tri-annual April 2023 data transmittal of water quality monitoring results under the Permit. As described herein, the overall results for the April 2023 monitoring round are generally consistent with the findings from recent tri-annual and supplemental monitoring rounds and the conceptual model of hydrogeologic conditions at the Site.

Monitoring results will continue to be tracked as indicated above, including background conditions as represented by the upgradient monitoring wells. Consistent with the Permit, the next tri-annual water quality sampling event is scheduled for July 2023.

Should you have questions regarding the information presented herein, or wish to discuss any of our findings and conclusions as presented in this report, please feel free to contact Tim White at Sanborn Head or Joe Gay at NCES.

Very truly yours,
SANBORN, HEAD & ASSOCIATES, INC.



Timothy M. White, P.G.
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GAP/MEE/TMW: gap

TABLE

Table 1 Evaluation of Background Exceedances – Groundwater Samples – April 2023

FIGURE

Figure 1 Site Features Plan
Figure 2 Groundwater Elevation Contour Plan

APPENDICES

Appendix A – Background Groundwater Quality Information
 A.1 – Summary of Background Groundwater Quality Conditions
 A.2 – Site Background Groundwater Quality Time-Series Plots (select analytes)
 A.3 – Exploration Location Plan (with decommissioned locations)
Appendix B – Summary of Historical Monitoring Data
 B.1 – Groundwater Elevations
 B.2 – Groundwater Analytical Results
 B.3 – Surface Water Analytical Results
Appendix C – Time Series Plots
 C.1 – Groundwater Analytical Results (Field and Indicator Parameters, VOCs)
 Background Wells
 Release Detection Wells Outside the GMZ
 Release Detection Wells Inside the GMZ
 Groundwater Management Wells Inside the GMZ
 C.2 – Surface Water Analytical Results
Appendix D – PFAS Groundwater Analytical Results

D.1 – Summary of PFAS Groundwater Analytical Results

D.2 – PFAS Plots

Appendix E – Sanborn Head Field Sampling Summary Forms

Appendix F – Analytical Laboratory Reports

Appendix G – Drought Information

cc: w/Appendices: Mr. Joe Gay, NCES
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