

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

October 27, 2020  
File No. 2637.07

Re: September 2020 Supplemental 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 supplemental groundwater quality sampling at the NCES Landfill (Site) on September 28, 2020. Although not 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 collected groundwater samples from monitoring wells B-304UR and B-304DR for analysis of VOCs, 1,4-dioxane, chloride, and bromide, consistent with recommendations included in the July/2020 Annual Water Quality Monitoring report<sup>1</sup>.

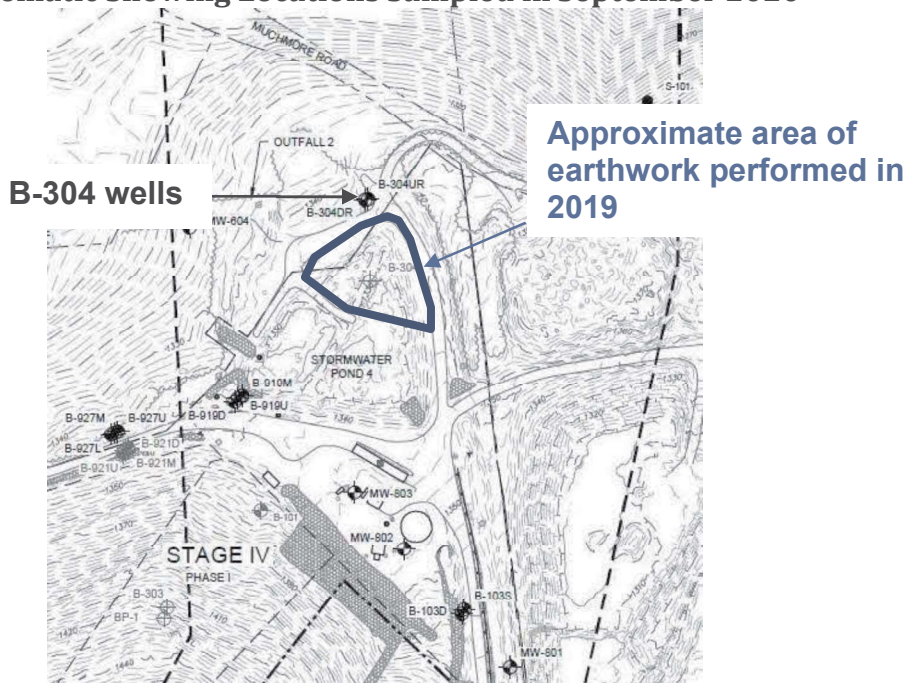
As summarized in previous submittals, concentrations of select analytes at B-304UR and B-304DR are being monitored to evaluate potential trends that began with sporadic detections of 1,4-dioxane at B-304UR in April 2017 and B-304DR in April 2019, and to evaluate the effects of earthwork performed upgradient of these wells in summer 2019 to remove unused landfill infrastructure. The recommended sampling of B-304UR and B-304DR in September 2020, prior to the routine November 2020 sampling event, was intended to provide additional results for key analytes at these two wells. In a September 21, 2020 email<sup>2</sup>, NHDES concurred with the recommendation to sample B-304UR and B-304DR.

The locations of the two groundwater monitoring wells sampled in September 2020 are shown in Exhibit 1 below. The Field Sampling Summary form is provided as Appendix A. The analytical data report is included as Appendix B. Water level elevation and analytical results summary tables are provided as Tables 1A and 1B, respectively, for B-304UR and B-304DR.

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<sup>1</sup> "2020 Summary of Water Quality Monitoring Results and Submittal of July 2020 Monitoring Results." Prepared by Sanborn Head & Associates, Inc. of Concord, New Hampshire, dated August 31, 2020.  
<sup>2</sup> September 21, 2020 Email from Mr. Jamie O'Rourke (NHDES) to Mr. John Gay (NCES): "Recommendation for September Sampling".

### Exhibit 1 Schematic Showing Locations Sampled in September 2020



### SUMMARY OF GROUNDWATER QUALITY RESULTS

Analytical results from the September 2020 samples collected from B-304UR and B-304DR are summarized in Exhibit 2 below, which also includes results from November 2019, April 2020, and July 2020 sampling rounds.

## Exhibit 2 Summary of September 2020 Sampling Results with Comparison to Previous Events

Unit			mg/L		ug/L	
Parameter			Bromide	Chloride	Dichlorodifluoromethane (DCDFM; CFC12)	1,4-Dioxane
GW-1 (AGQS)					1,000	0.32
SMCL				250		
Background			0.4	7	< 5	< 0.25
Sample Location	Sample Date	Sample Type				
B-304UR	11/4/2019	N	1.5	200	<5	<b>5.4</b>
	11/22/2019	N	1.7	220	NA	<b>6.9</b>
	4/21/2020	N	<0.1	33	<2	<0.25
	7/13/2020	N	0.74	110	<2	<b>1.7</b>
	9/28/2020	N	0.91	130	<2	<b>3.9</b>
B-304DR	11/4/2019	N	0.24	52	<5	<b>1</b>
	11/22/2019	N	0.28	54	NA	<b>1.4</b>
	4/21/2020	FD	0.36	57	4.5	<b>1.3</b>
	4/21/2020	N	0.33	60	4.3	<b>1.1</b>
	7/13/2020	N	0.65	100	<2	<b>2.9</b>
	9/28/2020	N	0.52	86	<2	<b>2.1</b>

**Notes:**

**Bold** values exceed the GW-1 Groundwater Standard for that analyte.

FD = Field duplicate; N = primary sample

NA = Not analyzed

### Volatile Organic Compounds (VOCs)

Consistent with the July 2020 results, only one VOC (1,4-dioxane) was detected at B-304UR and B-304DR in September 2020. The 1,4-dioxane concentrations at both B-304UR and B-304DR in September 2020 were within the range of concentrations recorded at these locations since November 2019, following earthwork performed upgradient of these locations in summer 2019. The September 2020 concentrations at both wells were above the AGQS of 0.32 µg/l.

Dichlorodifluoromethane (DCDFM; CFC12), which was detected in the primary and duplicate sample collected from B-304DR in April 2020 at concentrations below the AGQS, was not detected in either well in July or September 2020.

### Inorganic Parameters

Concentrations of bromide and chloride at B-304UR and B-304DR have been variable since November 2019 and were included for analysis in September 2020 sampling to provide additional information regarding potential concentration trends at these locations.

### Bromide

Bromide concentrations at B-304UR and B-304DR in September 2020 were within the range of concentrations recorded at these locations since November 2019. The bromide

concentrations at B-304UR and B-304DR in September 2020 were higher than the background value for wells inside the GMZ (0.4 mg/L).

### **Chloride**

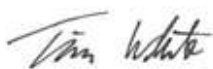
Chloride concentrations at B-304UR and B-304DR in September 2020 were within the range of concentrations recorded at these locations since November 2019. Historically, the chloride concentrations at B-304UR and B-304DR have typically been higher than the site background concentration (7 mg/L).

### **CONCLUSIONS**

Concentrations of 1,4-dioxane, bromide, and chloride at both B-304UR and B-304DR in September 2020 were within the range of concentrations detected at these locations since November 2019. Results of this supplemental sampling round are consistent with residual effects related to earthwork performed upgradient of B-304UR and B-304DR in summer 2019 to remove unused landfill infrastructure. Together with the July 2020 results, an ongoing release from the landfill is not indicated given that VOCs and 1,4-dioxane were not detected in wells located generally upgradient of the B-304 wells and downgradient of the landfill (e.g., B-102 series well, B-103 series wells, MW-801, MW-802, MW-802, and the B-919 series wells).

In accordance with the Permit, analysis at B-304UR and B-304DR will continue in November 2020 with the next tri-annual water quality sampling event. The concentrations of VOCs, 1,4-dioxane, bromide, and chloride, as well as other Permit-required analytes, will continue to be closely tracked at these locations. In addition, re-development of B-304DR to remove accumulated silt in this well will be discussed with NHDES following receipt of results from the November 2020 sampling event.

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



Timothy M. White, P.G.  
Project Director



Charles A. Crocetti, Ph.D., P.G.  
Senior Vice President and Principal

TMW/CAC: swm