Annual Groundwater Monitoring and Corrective Action Report

MERRIMACK STATION COAL ASH LANDFILL

Bow, New Hampshire

Prepared for GSP Merrimack LLC
File No. 2025.13
January 18, 2023

Sanborn, Head & Associates, Inc.

Digitally signed by Sanborn, Head & Associates, Inc.
Date: 2023.01.18 13:24:48 -05'00'

TABLE OF CONTENTS

1.0 INTRODUCTION

Groundwater monitoring at the Merrimack Station Coal Ash Landfill site (Site) in Bow, New Hampshire is required pursuant to 40 CFR Part 257.90. Sanborn, Head & Associates, Inc. (Sanborn Head) prepared this 2022 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) for the Site as required by 40 CFR Part 257.90(e), and this Annual Report covers the reporting period from January 1, 2022, through December 31, 2022. This report and the services provided by Sanborn Head are subject to the Limitations provided in Appendix A.

2.0 GROUNDWATER MONITORING AND CORRECTIVE ACTIONS OVERVIEW

As required under 40 CFR Part 257.90(e)(6), the following summarizes the groundwater monitoring and corrective action programs for the 2022 annual reporting period.

i. The Site was operating under the detection monitoring program at the start of the annual reporting period.
ii. The Site was operating under the detection monitoring program at the end of the annual reporting period, i.e., there was no need to implement assessment monitoring.
iii. Statistically significant increases (SSIs) over background were detected at the Site. Pursuant to 40 CFR Part 257.94(e)(2), demonstrations that these SSIs were due to natural variation in groundwater quality have been completed and the Site continues to operate under the detection monitoring program. Alternative Source Demonstrations (ASDs), provided in Appendix C, were prepared for the following constituents and monitoring wells, and additional information regarding the statistical analyses and ASDs is provided in Section 6.
    a. February 2022 ASD for total dissolved solids [TDS] at SB-1;[1]
    b. May 2022 ASD for TDS at SB-1, SB-4, and SB-6; and chloride at SB-1 and SB-6;[2] and
    c. November 2022 ASD for calcium, chloride, and TDS at SB-1.[3]
iv. There were no statistically significant exceedances of groundwater protection standards.
v. There were no remedy selections required pursuant to 40 CFR Part 257.97.
vi. There were no initiated or ongoing remedial activities required pursuant to 40 CFR Part 257.98.

3.0 REPORT REQUIREMENTS

As required under 40 CFR Part 257.90(e), this Annual Report includes the following information:

1. A map and diagram showing the Site and the background (or upgradient) and downgradient monitoring wells that are part of the groundwater monitoring program for the Site;
2. Identification of monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;
3. Monitoring data obtained under 40 CFR Parts 257.90 through 257.98, including:

---

1 The April 2021 laboratory analytical data were received on June 11, 2021. Confirmatory sampling, which is used with the "1-of-2" retesting strategy, was completed in September 2021. The SSI was detected in statistical analyses completed November 9, 2021.

2 The November 2021 laboratory analytical data were received on December 8, 2021. Confirmatory sampling, which may be used with the "1-of-2" retesting strategy, was elected to not be completed, and the SSI was detected in statistical analyses completed March 2, 2022.

3 The April 2022 laboratory analytical data were received on April 29, 2022. Confirmatory sampling, which may be used with the "1-of-2" retesting strategy, was elected to not be completed, and the SSIs were assumed on August 5, 2022.

   a. The number of groundwater samples that were collected for analysis for each background and downgradient well;
   b. The dates the samples were collected; and
   c. Whether the sample was required by the detection monitoring or assessment monitoring programs;
4. A narrative discussion of transitions, if any, between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);
5. Other information required to be included in the annual report as specified in 40 CFR Parts 257.90 through 257.98, including;
   a. Groundwater elevations measured in each well immediately prior to purging and the rate and direction of groundwater flow, as calculated by the owner or operator of the Site, each time groundwater is sampled (40 CFR Part 257.93(c)); and
   b. Written demonstrations prepared by a qualified professional engineer demonstrating that a source other than the Site caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality (40 CFR Part 257.94(e)(2));
6. As provided in the groundwater monitoring and corrective actions overview above, a section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the Site.

4.0 BACKGROUND

The Site has been operating since 1978 and was constructed in a former sand and gravel quarry on the property adjacent to the Merrimack Station electric power generation facility in Bow, New Hampshire. The landfill was constructed with a Hypalon geomembrane liner system and a leachate collection system, and it receives coal ash from the nearby Merrimack Station electric power generation facility. A portion of the landfill was filled to final grade and was capped with a final cover system. A Locus Plan for the Site is provided as Figure 1, and the locations of the monitoring wells in relation to the landfill are indicated on the Facility Plan, Figure 2.

The groundwater quality at the Site has been routinely monitored since the 1980s under New Hampshire Department of Environmental Services (NHDES) regulations. The current groundwater monitoring program, as prescribed by the NHDES Groundwater Release Detection Permit No. GWP-198400065-B-007, issued May 2, 2022, requires measuring of static groundwater levels and laboratory analyses of groundwater samples from five (5) overburden monitoring wells (i.e., SB-1, SB-4, SB-6, SB-13, and SB-14) on a semi-annual basis.

As discussed in the Groundwater Monitoring Well Network Verification (Sanborn Head, January 14, 2016), the five monitoring wells were certified as an appropriate groundwater monitoring system and were constructed to meet the requirements of 40 CFR Part 257.91. No monitoring wells were installed or decommissioned at the Site during the reporting period.

5.0 SUMMARY OF GROUNDWATER MONITORING

As specified in 40 CFR Part 257.94(b), a detection monitoring program was initiated in October 2015. A Sampling and Analysis Plan (Sanborn Head, last revised on October 7, 2016) was prepared to address the requirements of 40 CFR part 257.93. Monitoring well SB-13 is the upgradient/background monitoring well for the Site. The other monitoring wells are considered downgradient or sidegradient to the landfill, although groundwater flow conditions at the Site vary over time. For the groundwater monitoring program, unfiltered groundwater samples were collected and analyzed by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire using low-flow sampling techniques, based on the U.S. Environmental Protection Agency (USEPA) Low Stress (Low Flow) Standard Operating Procedure, revised September 20, 2017.

As part of the detection monitoring program, eight independent samples for each background and downgradient well were collected and analyzed for the constituents listed in 40 CFR Part 257 Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids) and Appendix IV (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, and radium 226 and 228 combined). The initial eight, independent samples were collected in February 2016 through April 2017 for the five Site monitoring wells. The statistical analysis of the groundwater monitoring data after the eight initial samples indicated that a transition between monitoring programs (i.e., to assessment monitoring) was not required.

Semi-annual detection monitoring, as specified in 40 CFR Part 257.94, was initiated in November 2017. Detection monitoring at the Site includes sampling the five wells for analysis of the Appendix III constituents. For the current reporting period, the semi-annual detection monitoring rounds were in April 2022 and November 2022. As described below, the data analyses completed during the reporting period indicated that a transition between monitoring programs (i.e., to assessment monitoring) was not required.

Groundwater analytical data are summarized in Table 1, and laboratory reports are provided in Appendix B. The groundwater level measurements and inferred general groundwater flow directions are summarized in Table 2.

6.0 SUMMARY OF STATISTICAL ANALYSIS

As required under 40 CFR Part 257.90(b)(iv), Sanborn Head evaluated groundwater monitoring data for a statistically significant increase (SSI) over background levels for the constituents listed in 40 CFR Part 257 Appendix III at the five Site monitoring wells. On May 4, 2018, Sanborn Head issued a Statistical Method Selection Certification, applicable to the statistical analysis completed on the groundwater analytical data collected through April 11, 2022. The certification is available in the Site's operating record. Statistical analysis of the November 2022 data is ongoing.

The prediction interval procedure specified in 40 CFR Part 257.93(f)(3) was selected for evaluation of the most recent parameter values for the site wells (i.e., SB-1, SB-4, SB-6, SB-13, and SB-14). The prediction interval procedure was performed on parameters specified in

Appendix III (i.e., boron, calcium, chloride, fluoride, pH, Sulfate, and total dissolved solids) using the multiple well and multiple parameter prediction limit equation.

Based on the prediction interval procedures performed for data collected for the Spring 2021, Fall 2021, and Spring 2022 monitoring rounds, SSIs over background levels were identified. Pursuant to 40 CFR Part 257.94(e)(2), within 90 days of detecting the SSI, Sanborn Head prepared ASDs that demonstrated, based on a weight-of-evidence approach, that both the SSIs were due to natural variation in groundwater quality. SSIs and corresponding ASDs are summarized in Exhibit 1, below. The ASDs are provided as Appendix C.

Exhibit 1: Alternative Source Demonstrations

Sampling Round	Sampling Date	SSI Location and Parameter	ASD Date
Spring 2021	April 28, 2021 & September 14, 2021	SB-1: TDS	February 4, 2022
Fall 2021	November 15, 2021	SB-1, SB-4, and SB-6: TDS SB-1 and SB-6: Chloride	May 31, 2022
Spring 2022	April 11, 2022	SB-1: Calcium, chloride, and TDS	November 3, 2022

Data for the November 2022 and groundwater detection monitoring round are included in Table 1; however, the statistical analysis for the November 2022 data is on-going. As stipulated in 40 CFR Part 257.93(h)(2), the Site operator has 90 days from completing the sampling and analysis to identify whether there is an SSI over background. The Fall 2022 samples were collected November 14, 2022; the laboratory analyses were received December 6, 2022; and the statistical analysis is due by March 6, 2023.

P:\2000s\2025.13\Source Files\202301 CCR Rpt\202301 CCR Rpt.docx

Tables

TABLE 1
Groundwater Analytical Results Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Metals																Miscellaneous Parameters							
		µg/L																				s.u	pCi/L		
		Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Silica	Selenium	Thallium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Radium 226	Radium 228	Radium 226+228
Drinking Water MCL		6	5	2,000	4	NS	5	NS	100	NS	15*	NS	2	NS	NS	50	2	NS	4,000	NS	NS	NS	NS	NS	5
CCR Alt. Standards		NA	NA	NA	NA	NA	NA	NA	NA	6	15	40	NA	100		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-1/(AGQS)		6 ‡	5 ‡	2,000 ‡	4 ‡	6,000 ‡	5 ‡	NS ‡	100	NS ‡	15 ‡	NS	2 ‡	NS	NS	50 ‡	2 ‡	NS	4,000	500,000	NS	NS	NS	NS	NS
GW-2		NA	NA	NA	NA	NA	NA	NS	NA	NS	NA	NS	NA	NS	NS	NA	NA	NS	†	†	NS	NS	NS	NS	NS
	2/24/2016	<1.0	<1.0	14	<1.0	60	<1.0	7,200	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	44,000	<100	8,000	96,000	5.21	0.2 ±0.1	0.6 ±0.6	0.8 ±0.6
	4/25/2016	<1.0	<1.0	18	<1.0	100	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	1.0		<1.0	<1.0	58,000	<100	9,000	120,000	5.72	0.5 ±0.2	0.2 ±0.4	0.7 ±0.4
	6/6/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	55,000	<100	7,000	140,000	5.52	0.6 ±0.3	0.2 ±0.5	0.8 ±0.5
	7/18/2016	<1.0	<1.0	16	<1.0	70	<1.0	8,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	60,000	<100	9,000	120,000	5.35	0.4 ±0.3	0.0 ±0.6	0.4 ±0.6
	8/30/2016	<1.0	<1.0	17	<1.0	<50	<1.0	7,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	49,000	<100	7,000	120,000	5.23	0.4 ±0.3	0.3 ±0.4	0.7 ±0.4
	10/17/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	60,000	<100	6,000	130,000	5.63	0.6 ±0.4	0.0 ±0.4	0.6 ±0.4
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	62,000	<100	6,000	88,000	5.63	1.0 ±0.4	0.8 ±0.5	1.8 ±0.5
	4/19/2017	<1.0	<1.0	16	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	56,000	<100	8,000	120,000	5.81	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
	11/17/2017					50		12,000										68,000	<100	8,000	120,000	5.70			
	1/31/2018 ¢							12,000																	
	4/9/2018					67		12,000										55,000	<100	10,000	160,000	5.90			
SB-1	7/25/2018 ¢							12,000										63,000		13,000	140,000	5.94			
	11/29/2018					87		13,000										66,000	<100	10,000	100,000	6.07			
	4/26/2019					100		13,000										55,000	<100	12,000	140,000	5.78			
	11/15/2019					59		11,000										68,000	<100	10,000	140,000	5.56			
	4/23/2020					70		14,000										53,000	<100	11,000	150,000	5.94			
	11/12/2020					<50		10,000										64,000	<100	13,000	150,000	5.36			
	2/4/2021 ¢							11,000										78,000		11,000	150,000	5.12			
	4/28/2021					78		14,000										62,000	<100	11,000	180,000	5.42			
	9/14/2021 ¢					58		13,000							14,000			69,000	<100	11,000	210,000	6.21			
	11/15/2021					<50		14,000							13,000			93,000	<100	9,600	220,000	4.99			
	4/11/2022					81		16,000										92,000	<100	12,000	240,000	5.75			
	11/14/2022					79		13,000										70,000	<100	15,000	190,000	5.36			
	2/23/2016	<1.0	<1.0	14	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	95,000	<100	9,000	210,000	5.49	0.3 ±0.1	1.0 ±0.6	1.3 ±0.6
	4/25/2016	<1.0	<1.0	14	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	110,000	<100	8,000	200,000	5.32	0.3 ±0.3	0.0 ±0.4	0.3 ±0.4
	6/6/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	110,000	<100	10,000	230,000	5.62	0.2 ±0.2	0.4 ±0.5	0.6 ±0.5
	7/18/2016	<1.0	<1.0	11	<1.0	<50	<1.0	7,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	11,000	220,000	5.27	0.4 ±0.3	0.4 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	<1.0	10	<1.0	<50	<1.0	6,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	88,000	<100	12,000	210,000	5.72	0.2 ±0.2	0.0 ±0.4	0.2 ±0.4
	10/17/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	10,000	190,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
	11/29/2016	<1.0	1.0	12	<1.0	<50	<1.0	7,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	10,000	180,000	5.79	0.7 ±0.3	0.5 ±0.5	1.2 ±0.5
	4/19/2017	<1.0	<1.0	19	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	120,000	<100	9,000	260,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
	11/17/2017					<50		10,000										77,000	<100	13,000	170,000	5.80			
	4/9/2018					<50		11,000										93,000	<100	12,000	220,000	5.87			
	7/25/2018 ¢							9,800										95,000		11,000	210,000	5.68			
SB-4	11/28/2018					<50		12,000										86,000	<100	13,000	83,000	6.28			
	4/26/2019					<50		13,000										94,000	<100	11,000	190,000	5.83			
	11/15/2019					53		11,000										97,000	<100	11,000	230,000	5.75			
	2/14/2020 ¢					<50		11,000										100,000		14,000	190,000	5.85			
	4/23/2020					55		13,000										140,000	<100	11,000	260,000	5.72			
	7/8/2020 ¢					57		11,000										99,000		14,000	240,000	5.59			
	11/12/2020					60		9,600										120,000	<100	18,000	260,000	5.18			
	2/4/2021 ¢					70		8,500										100,000		20,000	240,000	5.22			
	4/28/2021					65		11,000										100,000	<100	16,000	230,000	5.71			
	11/15/2021					<50		11,000							12,000			130,000	<100	12,000	290,000	5.16			
	4/11/2022					55		13,000										110,000	<100	20,000	250,000	5.68			
	11/14/2022					<50		14,000										150,000	<100	9,700	320,000	5.46			
	2/23/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	80,000	<100	10,000	170,000	5.55	0.1 ±0.07	0.5 ±0.5	0.6 ±0.5
	4/25/2016	<1.0	<1.0	16	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	7,000	220,000	5.55	0.4 ±0.3	0.0 ±0.4	0.4 ±0.4
	6/6/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	8,000	270,000	5.40	0.5 ±0.3	0.0 ±0.5	0.5 ±0.5
	7/18/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	9,000	260,000	5.27	0.5 ±0.3	0.3 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	9,000	280,000	5.71	0.4 ±0.2	0.0 ±0.4	0.4 ±0.4
	10/17/2016	<1.0	<1.0	18	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	260,000	5.78	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	130,000	<100	9,000	230,000	5.77	0.5 ±0.2	0.8 ±0.5	1.3 ±0.5
	4/19/2017	<1.0	<1.0	13	<1.1	<51	<1.1	7,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	9,000	190,000	5.68	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
	11/17/2017					<50		9,900										130,000	<100	11,000	230,000	5.60			
	4/9/2018					<50		7,900										120,000	<100	9,500	240,000	5.57			
SB-6	7/25/2018 ¢							11,000										180,000		12,000	310,000	5.44			
	11/28/2018					<50		11,000										150,000	<100	11,000	140,000	5.86			
	4/26/2019					84		13,000										150,000	<100	14,000	210,000	5.78			
	7/11/2019 ¢					80		14,000										170,000		15,000	330,000	5.84			
	11/15/2019					52		10,000										140,000	<100	13,000	280,000	5.75			
	2/14/2020 ¢					<50		5,100										79,000		15,000	130,000	5.73			
	4/23/2020					<50		12,000										160,000	<100	8,100	270,000	5.56			
	11/12/2020					<50		12,000										180,000	<100	9,600	330,000	5.37			
	4/28/2021					<50		11,000										150,000	<100	6,700	290,000	5.58			
	11/15/2021					<50		12,000							12,000			200,000	<100	8,800	370,000	5.27			
	4/11/2022					<50		10,000										170,000	<100	9,400	330,000	5.80			
	11/14/2022					<50		6,800										110,000	<100	11,000	240,000	5.53			
	2/23/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	160,000	<100	6,000	270,000	5.34	0.6 ±0.1	0.3 ±0.6	0.9±0.6
	4/25/2016	<1.0	<1.0	17	<1.0	<50	<1.0	8,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	160,000	<100	7,000	290,000	5.48	0.4 ±0.3	0.1 ±0.4	0.5 ±0.4
	6/6/2016	<1.0	<1.0	20	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	170,000	<100	7,000	320,000	5.50	0.8 ±0.3	0.0 ±0.5	0.8 ±0.5
	7/18/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	160,000	<100	8,000	330,000	5.27	0.8 ±0.3	0.0 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	1.0	20	<1.0	<50	<1.0	8,100	2.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	270,000	5.35	0.8 ±0.3	0.6 ±0.4	1.4 ±0.4
	10/17/2016	<1.0	<1.0	15	<1.0	<50	<1.0	8,800	2.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	260,000	5.06	0.7 ±0.4	0.6 ±0.5	1.3 ±0.5
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	7,400	1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	8,000	240,000	5.71	0.6 ±0.3	0.7 ±0.5	1.3 ±0.5
	4/19/2017	<1.0	<1.0	16	<1.1	<51	<1.1	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	130,000	<100	8,000	270,000	5.56	0.9 ±0.3	0.3 ±0.5	1.2 ±0.5
	11/17/2017					<50		7,000										110,000	<100	9,000	220,000	5.80			
	4/9/2018					<50		11,000										170,000	<100	8,000	330,000	5.81			
SB-13	7/25/2018 ¢							10,000										190,000		8,700	340,000	5.69			
	11/28/2018					<50		13,000										200,000	<100	7,200	260,000	5.77			
	4/26/2019					<50		14,000										200,000	<100	7,100	290,000	5.53			
	11/15/2019					<50		8,100										140,000	<100	8,100	280,000	5.82			
	4/23/2020					<50		14,000										230,000	<100	6,500	400,000	5.47			
	7/8/2020 ¢					<50		14,000										210,000		6,900	370,000	5.41			
	11/12/2020					<50		11,000										180,000	<100	8,000	330,000	4.96			
	2/4/2021 ¢					< 50		11,000										180,000		6,700	320,000	5.32			
	4/28/2021					<50		14,000										240,000	<100	5,900	410,000	5.31			
	11/15/2021					<50		11,000							12,000			200,000	<100	7,900	370,000	5.02			
	4/11/2022					<50		9,800										190,000	<100	9,700	360,000	5.47			
	11/14/2022					<50		7,700										150,000	<100	8,200	310,000	5.55			
	2/24/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,100	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	16,000	<100	4,000	56,000	5.05	0.2 ±0.08	0.0 ±0.5	0.2 ±0.5
	4/25/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	11,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	58,000	<100	3,000	140,000	5.62	0.8 ±0.5	0.2 ±0.1	1.0 ±0.5
	6/6/2016	<1.0	<1.0	6.0	<1.0	<50	<1.0	7,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	32,000	<100	4,000	100,000	5.39	0.5 ±0.2	0.2 ±0.5	0.7 ±0.5
	7/18/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	21,000	<100	5,000	68,000	5.31	0.2 ±0.2	0.3 ±0.5	0.5 ±0.5
	8/30/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	14,000	<100	4,000	71,000	5.81	0.4 ±0.3	0.4 ±0.5	0.8 ±0.5
	10/17/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	4,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	11,000	<100	4,000	29,000	5.55	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
	11/29/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	2,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	7,000	<100	4,000	12,000	5.19	0.2 ±0.4	0.2 ±0.5	0.4 ±0.5
	4/19/2017	<1.0	<1.0	10	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	56,000	<100	5,000	120,000	5.59	0.7 ±0.3	0.1 ±0.5	0.8 ±0.5
	11/17/2017					<50		8,000										18,000	<100	5,000	59,000	5.60			
	4/9/2018					<50		4,200										14,000	<100	8,400	80,000	5.76			
SB-14	7/25/2018 ¢							5,100										9,800		6,100	56,000	5.61			
	11/28/2018					<50		4,500										7,800	<100	6,300	<5,000	5.96			
	4/26/2019					<50		8,700										19,000	<100	3,700	91,000	5.74			
	11/15/2019					<50		5,000										12,000	<100	7,800	69,000	5.94			
	4/23/2020					<50		5,500										9,200	<100	5,500	52,000	5.63			
	11/12/2020					<50		4,000										4,700	<100	15,000	68,000	5.10			
	2/4/2021 ¢							7,900										34,000		6,000	95,000	5.30			
	4/28/2021					<50		3,300										4,000	<100	7,100	42,000	5.37			
	11/15/2021					<50		3,400							11,000			9,300	<100	16,000	64,000	5.55			
	4/11/2022					<50		4,400										12,000	<100	9,600	44,000	5.76			
	11/14/2022					<50		5,600										10,000	<100	18,000	72,000	5.74			

Notes:

1. Samples were collected by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire on the dates indicated and analyzed by EAI for select metals by USEPA Method 6020. Additional analysis for select wet chemistry parameters were completed by EAI. Analysis for radium 226 and 228 was completed by KNL Environmental Testing, Inc., of Tampa, Florida. Analysis for lithium was completed by SGS Accutest, of Marlborough, Massachussets (Feb. 2016) and Katahdin Analytical Services, of Scarborough, Maine (April 2016 through October 2016).

2. Concentrations are presented in micrograms per liter (µg/L), which are equivalent to parts per billion (ppb), or they are presented in picoCuries per liter (pCi/L) or pH standard units.

3. "<" indicates the analyte was not detected above the indicated laboratory reporting limit.
A blank indicates the sample was not analyzed for this parameter.

4. "GW-1" and "GW-2" 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 equivalent to the Ambient Groundwater Quality Standards (AGQSs) promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water. The GW-2 Groundwater Standards apply to groundwater as a potential source of indoor air contamination.

5. "Drinking Water MCLs" are from the United States Environmental Protection Agency (EPA) website (accessed March 22, 2016). The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are enforceable standards for drinking water systems.
"CCR Alt. Standards" were codified in 40 CFR Part 257.95(h)(2) for cobalt, lead, lithium, and molybdenum. These are alternative risk-based standards for the four constituents without MCLs that may require establishment of a groundwater protection standard under the coal combustion residuals (CCR) rules 40 CFR Part 257(h).

6. "*" indicates an MCL value is not currently available, and the listed value is an action level.
"†" indicates the RCMP lists the value as not currently available.
"‡" indicates the value provided is typically applied to field-filtered samples (i.e., dissolved analytes) for overburden monitoring wells.
"NA" indicates the RCMP lists the value as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the retesting program for identifying statistically significant increases (SSIs).

TABLE 2
Groundwater Level Measurements Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Date	Depths and elevations in feet.																
	SB-1			SB-4			SB-6			SB-13			SB-14			Inferred General Groundwater Flow Rate (feet/day)	Inferred General Groundwater Flow Direction
	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation		
Feb-16	240.85	33.82	207.03	274.26	67.36	206.90	268.77	61.84	206.93	219.86	11.83	208.03	242.70	34.88	207.82	0.5 - 2.7	Northeast
Apr-16	240.85	32.19	208.66	274.26	65.63	208.63	268.77	60.07	208.70	219.86	10.16	209.70	242.70	33.13	209.57	0.5 - 2.5	Northeast
Jun-16	240.85	31.84	209.01	274.26	66.24	208.02	268.77	60.80	207.97	219.86	11.11	208.75	242.70	33.93	208.77	0.4 - 1.9	East
Jul-16	240.85	33.88	206.97	274.26	67.30	206.96	268.77	62.07	206.70	219.86	12.41	207.45	242.70	35.10	207.60	0.4 - 1.9	Northeast
Aug-16	240.85	35.09	205.76	274.26	68.54	205.72	268.77	63.19	205.58	219.86	13.76	206.10	242.70	36.39	206.31	0.3 - 1.4	Northeast
Oct-16	240.85	36.20	204.65	274.26	69.68	204.58	268.77	64.42	204.35	219.86	13.92	205.94	242.70	37.58	205.12	0.8 - 3.9	North-Northeast
Nov-16	240.85	36.40	204.45	274.26	69.93	204.33	268.77	64.69	204.08	219.86	15.14	204.72	242.70	37.80	204.90	0.3 - 1.6	East-Northeast
Apr-17	240.85	32.27	208.58	274.26	65.82	208.44	268.77	60.04	208.73	219.86	9.58	210.28	242.70	32.99	209.71	0.8 - 3.8	North-Northeast
Nov-17	240.85	32.87	207.98	274.26	66.39	207.87	268.77	60.97	207.80	219.86	11.33	208.53	242.70	34.08	208.62	0.4 - 1.8	Northeast
Apr-18	240.85	31.13	209.72	274.26	64.58	209.68	268.77	58.93	209.84	219.86	8.74	211.12	242.70	31.94	210.76	0.6 - 3.2	North-Northeast
Jul-18	240.85	32.60	208.25	274.26	66.01	208.25	268.77	60.84	207.93	219.86	11.13	208.73	242.70	33.78	208.92	0.4 - 2.0	Northeast
Nov-18	240.85	29.99	210.86	274.26	63.59	210.67	268.77	57.92	210.85	219.86	7.66	212.20	242.70	30.82	211.88	0.7 - 3.3	Northeast
Apr-19	240.85	29.83	211.02	274.26	63.34	210.92	268.77	57.60	211.17	219.86	7.51	212.35	242.70	30.72	211.98	0.6 - 2.9	North-Northeast
Jul-19	–	–	–	–	–	–	268.77	58.71	210.06	–	–	–	–	–	–	–	–
Nov-19	240.85	34.48	206.37	274.26	67.96	206.30	268.77	62.66	206.11	219.86	13.21	206.65	242.70	35.85	206.85	0.3 - 1.3	East-Northeast
Feb-20	–	–	–	274.26	66.67	207.59	268.77	61.12	207.65	–	–	–	–	–	–	–	–
Apr-20	240.85	31.84	209.01	274.26	65.34	208.92	268.77	59.73	209.04	219.86	9.62	210.24	242.70	32.75	209.95	0.6 - 3.0	North-Northeast
Jul-20	–	–	–	274.26	66.00	208.26	–	–	–	219.86	11.00	208.86	–	–	–	–	–
Nov-20	240.85	35.72	205.13	274.26	69.23	205.03	268.77	63.92	204.85	219.86	14.48	205.38	242.70	37.09	205.61	0.3 - 1.3	East-Northeast
Feb-21	240.85	33.85	207.00	274.26	67.36	206.90	–	–	–	219.86	12.12	207.74	242.70	34.88	207.82	–	–
Apr-21	240.85	33.37	207.48	274.26	66.88	207.38	268.77	61.31	207.46	219.86	11.43	208.43	242.70	34.38	208.32	0.5 - 2.4	Northeast
Sep-21	240.85	31.11	209.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nov-21	240.85	31.65	209.20	274.26	65.17	209.09	268.77	59.72	209.05	219.86	10.04	209.82	242.70	32.78	209.92	0.4 - 1.9	Northeast
Apr-22	240.85	31.10	209.75	274.26	64.61	209.65	268.77	59.12	209.65	219.86	9.22	210.64	242.70	32.05	210.65	0.5 - 2.5	Northeast
Nov-22	240.85	35.06	205.79	274.26	68.62	205.64	268.77	63.27	205.50	219.86	13.80	206.06	242.70	36.46	206.24	0.3 - 1.4	East-Northeast

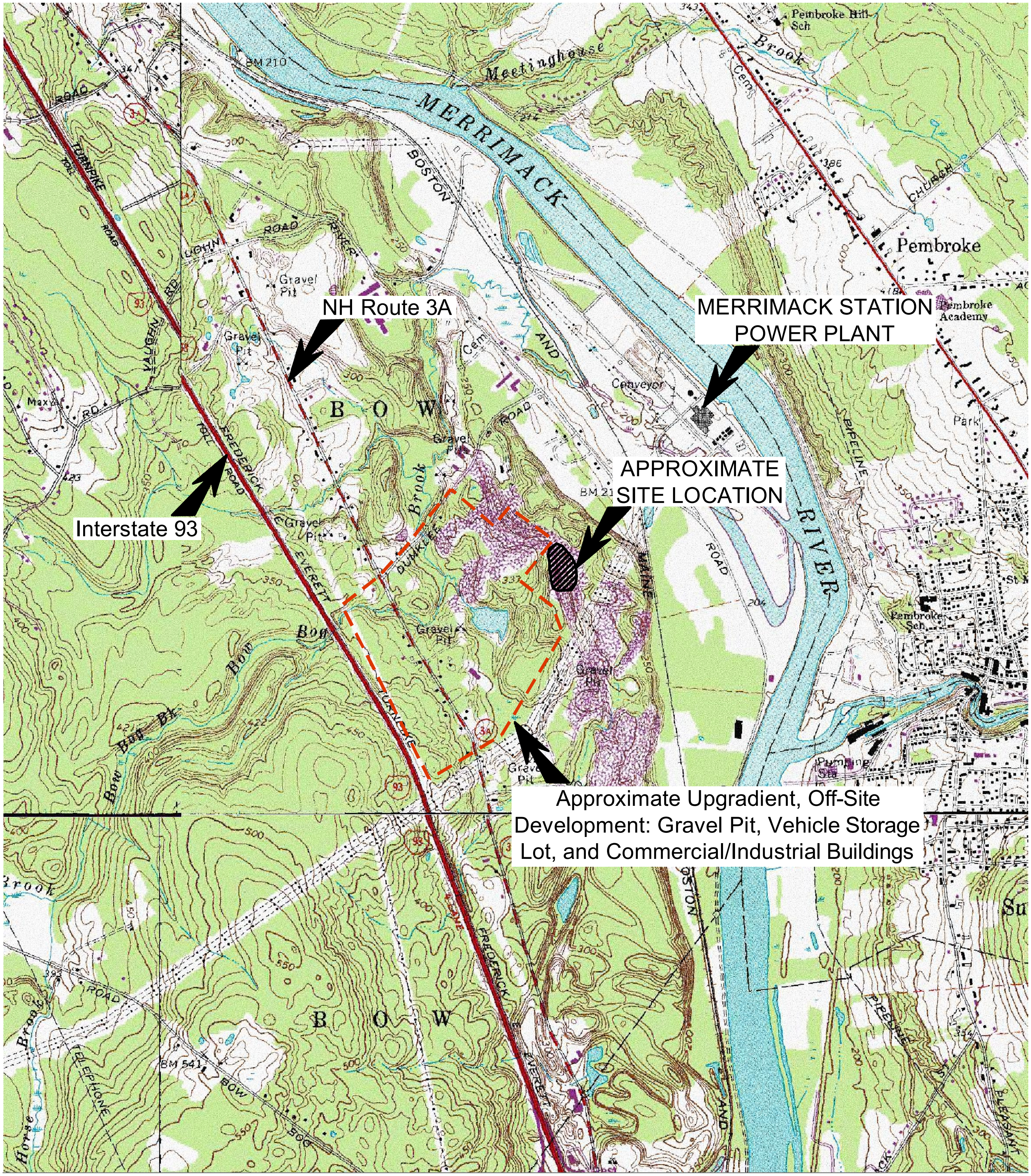
Notes:

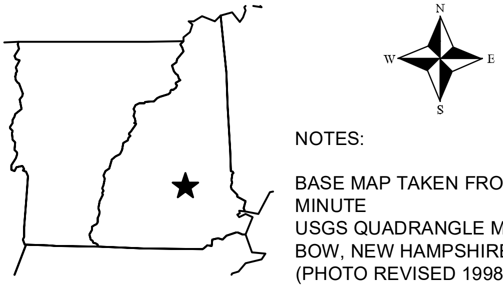
1. Depths to water were obtained from information provided in laboratory reports and field sampling sheets prepared by Eastern Analytical, Inc.

2. Inferred general groundwater flow rates and flow directions are approximate and are based on the limited hydrogeologic and groundwater elevation data available. Other interpretations are possible and actual conditions may vary from those indicated. Note that groundwater elevations, directions, and rates may change due to seasonal or other variations in temperature, precipitation, runoff, or other factors.

3. Approximate groundwater flow rates were calculated using an assumed saturated hydraulic conductivity of 100 to 500 feet per day, and an assumed porosity of 39%. Assumptions are consistent with values typical of medium-grained, clean sand. The calculated groundwater flow rate is equivalent to the average interstitial velocity or the seepage velocity.

Figures





NOTES:

BASE MAP TAKEN FROM 7.5 MINUTE USGS QUADRANGLE MAP: BOW, NEW HAMPSHIRE 1967 (PHOTO REVISED 1998)

Drawn By: D. Dombrowsky
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.13
Date: November 2022

1000 0 2000 Feet

SANBORN HEAD

Figure 1
Locus Plan

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

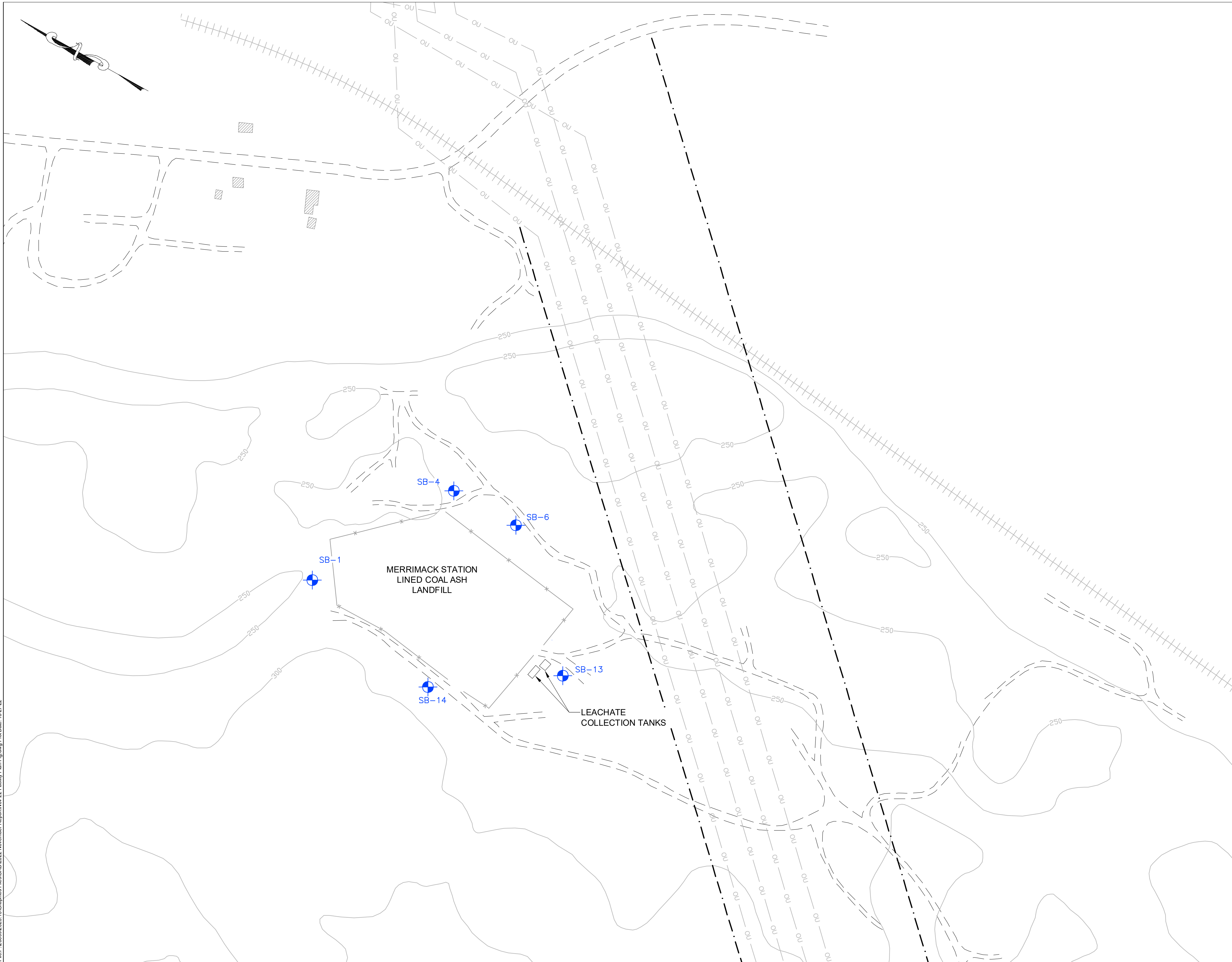


Figure 2

Facility Plan

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: D. Dombrowsky
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.13
Date: November 2022

Notes

1. The base map was developed from a drawing prepared by Public Service Company of New Hampshire's Engineering Division entitled, "Area Plan, Merrimack Station, Bow, N.H." The drawing was dated 5/1/90 and was last revised on 6/28/95.
2. The location of the landfill and the site features shown should be considered approximate.

Legend

SB-4 Monitoring Well
Right-Of-Way
Fence
OU Overhead Utilities
250 Elevation Contour

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.13\Graphics Files\CAD\2022 November Report\Nov 22 Facility Plan Fig.dwg Plot Date: 10-27-22

Appendix A

Limitations

APPENDIX A
LIMITATIONS

1. The conclusions and recommendations described in this report are based in part on the data obtained from a limited number of groundwater samples from widely-spaced monitoring locations. The monitoring locations indicate conditions only at the specific locations and times, and only to the depths sampled. They do not necessarily reflect variations that may exist between such locations, and the nature and extent of variations between these monitoring locations may not become evident until further study or remediation is initiated. The validity of the conclusions is based in part on assumptions Sanborn Head has made about conditions at the site. If conditions different from those described become evident, it will be necessary to re-evaluate the conclusions of this report.
2. Water level measurements were made in the monitoring well locations at times and under conditions stated within the report. Fluctuations in the levels of the groundwater may occur due to variations in precipitation and other factors not evident at the time measurements were made.
3. Quantitative laboratory analyses were performed as noted within the report. Additional analytes not searched for during the current study may be present in groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Additionally, variations in the types and concentrations of analytes and variations in their distributions within the groundwater may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
4. The conclusions and recommendations contained in this report are based in part upon various types of chemical data as well as historical and hydrogeologic information developed during previous studies. While Sanborn Head has reviewed those data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that have relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions, and recommendations presented herein should be modified accordingly.
5. This report was prepared for the exclusive use of GSP Merrimack LLC (GSP) for specific application for 40 CFR Part 257.90 compliance for GSP's Merrimack Station Coal Ash landfill in Bow, New Hampshire, and was prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

P:\2000s\2025.12\Source Files\202201 CCR Rpt\Att A - Limitations\Limitations.docx

Appendix B

Laboratory Reports

Eastern Analytical, Inc.

professional laboratory and drilling services

Allan Palmer
Granite Shore Power
431 River Road
Bow , NH 03304

Laboratory Report for:

Eastern Analytical, Inc. ID:	241263
Client Identification:	Merrimack Station - Coal Ash
Date Received:	4/11/2022

Enclosed are the analytical results per the Chain of Custody for sample(s) in the referenced project. All analyses were performed in accordance with our QA/QC Program, NELAP and other applicable state requirements. All quality control criteria was within acceptance criteria unless noted on the report pages. Results are for the exclusive use of the client named on this report and will not be released to a third party without consent.

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the written approval of the laboratory.

The following standard abbreviations and conventions apply to all EAI reports:

- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Certifications:
Eastern Analytical, Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012), New York (12072), West Virginia (9910C) and Alabama (41620). Please refer to our website at www.easternanalytical.com for a copy of our certificates and accredited parameters.

References:

- EPA 600/4-79-020, 1983
- Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd edition or noted revision year.
- Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- Hach Water Analysis Handbook, 4th edition, 1992

If you have any questions regarding the results contained within, please feel free to contact customer service. Unless otherwise requested, we will dispose of the sample(s) 6 weeks from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director — Date: 4.29.22

SAMPLE CONDITIONS PAGE

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Temperature upon receipt (°C): 1.9

Acceptable temperature range (°C): 0-6

Received on ice or cold packs (Yes/No): Y

Lab ID	Sample ID	Date Received	Date/Time Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
241263.01	SB-1	4/11/22	4/11/22 15:24	aqueous		Adheres to Sample Acceptance Policy
241263.02	SB-4	4/11/22	4/11/22 10:21	aqueous		Adheres to Sample Acceptance Policy
241263.03	SB-6	4/11/22	4/11/22 11:15	aqueous		Adheres to Sample Acceptance Policy
241263.04	SB-13	4/11/22	4/11/22 12:56	aqueous		Adheres to Sample Acceptance Policy
241263.05	SB-14	4/11/22	4/11/22 13:10	aqueous		Adheres to Sample Acceptance Policy

All results contained in this report relate only to the above listed samples.

Unless otherwise noted:

- *Hold times, preservation, container types, and sample conditions adhered to EPA Protocol.*
- *Solid samples are reported on a dry weight basis, unless otherwise noted. pH/Corrosivity, Flashpoint, Ignitability, Paint Filter, Conductivity and Specific Gravity are always reported on an "as received" basis.*
- *Analysis of pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite were performed at the laboratory outside of the recommended 15 minute hold time.*
- *Samples collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures.*

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 241263.01

Matrix: aqueous

Date Sampled: 4/11/22

Date Received: 4/11/22

		Units	Analysis Date	Analysis Time	Method	Analyst
Solids Dissolved	**240**	mg/L	4/18/22	12:20	2540C-11	CF
Fluoride	< 0.1	mg/L	4/12/22	13:01	300.0	LLG
Sulfate	**12**	mg/L	4/12/22	13:01	300.0	LLG
Chloride	**92**	mg/L	4/12/22	13:01	300.0	LLG
Alkalinity Total (CaCO3)	**18**	mg/L	4/19/22	13:24	2320B-11	MKB

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-13	SB-14					
Lab Sample ID:	241263.02	241263.03	241263.04	241263.05					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	4/11/22	4/11/22	4/11/22	4/11/22		Analysis			
Date Received:	4/11/22	4/11/22	4/11/22	4/11/22	Units	Date	Time	Method	Analyst
Solids Dissolved	**250**	**330**	**360**	**44**	mg/L	4/18/22	12:20	2540C-11	CF
Fluoride	< 0.1	< 0.1	< 0.1	< 0.1	mg/L	4/12/22	13:34	300.0	LLG
Sulfate	**20**	**9.4**	**9.7**	**9.6**	mg/L	4/12/22	13:34	300.0	LLG
Chloride	**110**	**170**	**190**	**12**	mg/L	4/12/22	13:50	300.0	LLG
Alkalinity Total (CaCO3)	**18**	**11**	**9.8**	**15**	mg/L	4/19/22	13:24	2320B-11	MKB

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 241263.01

Matrix: aqueous

Date Sampled: 4/11/22

Date Received: 4/11/22

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Boron	**0.081**	AqTot	mg/L	4/13/22	200.8	DS
Calcium	**16**	AqTot	mg/L	4/13/22	200.8	DS
Magnesium	**3.8**	AqTot	mg/L	4/13/22	200.8	DS
Potassium	**2.0**	AqTot	mg/L	4/13/22	200.8	DS
Sodium	**48**	AqTot	mg/L	4/13/22	200.8	DS

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-13	SB-14					
Lab Sample ID:	241263.02	241263.03	241263.04	241263.05					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	4/11/22	4/11/22	4/11/22	4/11/22	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	4/11/22	4/11/22	4/11/22	4/11/22					
Boron	**0.055**	< 0.05	< 0.05	< 0.05	AqTot	mg/L	4/13/22	200.8	DS
Calcium	**13**	**10**	**9.8**	**4.4**	AqTot	mg/L	4/13/22	200.8	DS
Magnesium	**3.3**	**2.5**	**2.2**	**1.2**	AqTot	mg/L	4/13/22	200.8	DS
Potassium	**2.2**	**2.1**	**2.0**	**0.78**	AqTot	mg/L	4/13/22	200.8	DS
Sodium	**69**	**100**	**120**	**12**	AqTot	mg/L	4/13/22	200.8	DS

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 241263.01

Matrix: aqueous

Date Sampled: 4/11/22

		Units	Date of Analysis	Method	Analyst
Field pH	**5.75**	SU	4/11/22	SM4500	AJG

LABORATORY REPORT

EAI ID#: **241263**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-13	SB-14				
Lab Sample ID:	241263.02	241263.03	241263.04	241263.05				
Matrix:	aqueous	aqueous	aqueous	aqueous				
Date Sampled:	4/11/22	4/11/22	4/11/22	4/11/22	**Units**	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.68**	**5.80**	**5.47**	**5.76**	SU	4/11/22	SM4500	AJG

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

241263

aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
SB-1	4/11/22 1524	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H2SO4 NaOH MEOH Na2S2O3 (ICE)					
SB-4	4/11/22 10:21	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H2SO4 NaOH MEOH Na2S2O3 (ICE)					
SB-6	4/11/22 11:15	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H2SO4 NaOH MEOH Na2S2O3 (ICE)					
SB-13	4/11/22 12:56	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H2SO4 NaOH MEOH Na2S2O3 (ICE)					
SB-14	4/11/22 13:10	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H2SO4 NaOH MEOH Na2S2O3 (ICE)					

aClientID Merrimack Station - Coal Ash
nProjectID 3949 **nYearMonth** 2022.04
Client (Pro Mgr) Allan Palmer
Customer Granite Shore Power
Address 431 River Road
City Bow NH 03304
Phone 230-7997
Fax

Results Needed by: Preferred date ______
Notes about project

ReportingOptions
☒ HC ☐ NO FAX ☐ EDD Disk
☐ Fax ☐ No partial FAX ☒ EDD emai

PO# 7263
Quote# ______
Ice: Y ☒ N ☐ **Temperature** 1.7 °C

Samples Collected by: JG, AG/EM

Relinquished by	Date/Time	Received by
[signature]	4/11/22 17:39	[signature]

Eastern Analytical, Inc. 51 Antrim Ave. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525

Eastern Analytical, Inc.
professional laboratory and drilling services

Allan Palmer
Granite Shore Power
431 River Road
Bow , NH 03304

Laboratory Report for:

Eastern Analytical, Inc. ID:	252302
Client Identification:	Merrimack Station - Coal Ash
Date Received:	11/14/2022

Enclosed are the analytical results per the Chain of Custody for sample(s) in the referenced project. All analyses were performed in accordance with our QA/QC Program, NELAP and other applicable state requirements. All quality control criteria was within acceptance criteria unless noted on the report pages. Results are for the exclusive use of the client named on this report and will not be released to a third party without consent.

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the written approval of the laboratory.

The following standard abbreviations and conventions apply to all EAI reports:
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Certifications:
Eastern Analytical, Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012), New York (12072), West Virginia (9910C) and Alabama (41620). Please refer to our website at www.easternanalytical.com for a copy of our certificates and accredited parameters.

References:
- EPA 600/4-79-020, 1983
- Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd edition or noted revision year.
- Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- Hach Water Analysis Handbook, 4th edition, 1992
- ASTM International

If you have any questions regarding the results contained within, please feel free to contact customer service. Unless otherwise requested, we will dispose of the sample(s) 6 weeks from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director — Date: 12.6.22

SAMPLE CONDITIONS PAGE

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Temperature upon receipt (°C): 2.9

Acceptable temperature range (°C): 0-6

Received on ice or cold packs (Yes/No): Y

Lab ID	Sample ID	Date Received	Date/Time Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
252302.01	SB-1	11/14/22	11/14/22 13:08	aqueous		Adheres to Sample Acceptance Policy
252302.02	SB-4	11/14/22	11/14/22 12:07	aqueous		Adheres to Sample Acceptance Policy
252302.03	SB-6	11/14/22	11/14/22 14:09	aqueous		Adheres to Sample Acceptance Policy
252302.04	SB-13	11/14/22	11/14/22 09:56	aqueous		Adheres to Sample Acceptance Policy
252302.05	SB-14	11/14/22	11/14/22 11:51	aqueous		Adheres to Sample Acceptance Policy

All results contained in this report relate only to the above listed samples.

Unless otherwise noted:

- *Hold times, preservation, container types, and sample conditions adhered to EPA Protocol.*
- *Solid samples are reported on a dry weight basis, unless otherwise noted. pH/Corrosivity, Flashpoint, Ignitability, Paint Filter, Conductivity and Specific Gravity are always reported on an "as received" basis.*
- *Analysis of pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite were performed at the laboratory outside of the recommended 15 minute hold time.*
- *Samples collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures.*

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 252302.01

Matrix: aqueous

Date Sampled: 11/14/22

Date Received: 11/14/22

		RL	Units	Analysis Date Time	Method	Analyst
Solids Dissolved	**190**	10	mg/L	11/15/22 13:30	2540C-11	APH
Fluoride	< 0.1	0.1	mg/L	11/20/22 22:51	300.0	KD
Sulfate	**15**	1	mg/L	11/20/22 22:51	300.0	KD
Chloride	**70**	1	mg/L	11/20/22 22:51	300.0	ALM
Alkalinity Total (CaCO3)	**13**	1	mg/L	11/22/22 9:17	2320B-11	BAF

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-13						
Lab Sample ID:	252302.02	252302.03	252302.04						
Matrix:	aqueous	aqueous	aqueous						
Date Sampled:	11/14/22	11/14/22	11/14/22		Analysis				
Date Received:	11/14/22	11/14/22	11/14/22	Units	Date	Time	Method	Analyst
Solids Dissolved	**320**	**240**	**310**	mg/L	11/15/22	13:30	2540C-11	APH
Fluoride	< 0.1	< 0.1	< 0.1	mg/L	11/20/22	23:05	300.0	KD
Sulfate	**9.7**	**11**	**8.2**	mg/L	11/20/22	23:05	300.0	KD
Chloride	**150**	**110**	**150**	mg/L	11/21/22	1:58	300.0	ALM
Alkalinity Total (CaCO3)	**13**	**15**	**12**	mg/L	11/22/22	9:17	2320B-11	BAF

Sample ID:	SB-14					
Lab Sample ID:	252302.05					
Matrix:	aqueous					
Date Sampled:	11/14/22		Analysis			
Date Received:	11/14/22	Units	Date	Time	Method	Analyst
Solids Dissolved	**72**	mg/L	11/15/22	13:30	2540C-11	APH
Fluoride	< 0.1	mg/L	11/20/22	23:48	300.0	KD
Sulfate	**18**	mg/L	11/20/22	23:48	300.0	KD
Chloride	**10**	mg/L	11/20/22	23:48	300.0	ALM
Alkalinity Total (CaCO3)	**13**	mg/L	11/22/22	9:17	2320B-11	BAF

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 252302.01

Matrix: aqueous

Date Sampled: 11/14/22

Date Received: 11/14/22

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Boron	**0.079**	AqTot	mg/L	11/17/22	200.8	DS
Calcium	**13**	AqTot	mg/L	11/17/22	200.8	DS
Magnesium	**3.0**	AqTot	mg/L	11/17/22	200.8	DS
Potassium	**1.7**	AqTot	mg/L	11/17/22	200.8	DS
Sodium	**44**	AqTot	mg/L	11/17/22	200.8	DS

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-13					
Lab Sample ID:	252302.02	252302.03	252302.04					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	11/14/22	11/14/22	11/14/22					
Date Received:	11/14/22	11/14/22	11/14/22	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Boron	< 0.05	< 0.05	< 0.05	AqTot	mg/L	11/17/22	200.8	DS
Calcium	**14**	**6.8**	**7.7**	AqTot	mg/L	11/17/22	200.8	DS
Magnesium	**3.3**	**1.6**	**1.7**	AqTot	mg/L	11/17/22	200.8	DS
Potassium	**2.5**	**1.7**	**1.8**	AqTot	mg/L	11/17/22	200.8	DS
Sodium	**100**	**85**	**110**	AqTot	mg/L	11/17/22	200.8	DS

Sample ID:	SB-14					
Lab Sample ID:	252302.05					
Matrix:	aqueous					
Date Sampled:	11/14/22					
Date Received:	11/14/22	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Boron	< 0.05	AqTot	mg/L	11/17/22	200.8	DS
Calcium	**5.6**	AqTot	mg/L	11/17/22	200.8	DS
Magnesium	**1.6**	AqTot	mg/L	11/17/22	200.8	DS
Potassium	**0.79**	AqTot	mg/L	11/17/22	200.8	DS
Sodium	**15**	AqTot	mg/L	11/17/22	200.8	DS

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID: SB-1

Lab Sample ID: 252302.01

Matrix: aqueous

Date Sampled: 11/14/22

		Units	Date of Analysis	Method	Analyst
Field pH	**5.36**	SU	11/14/22	SM4500	TNC

LABORATORY REPORT

EAI ID#: **252302**

Client: **Granite Shore Power**

Client Designation: **Merrimack Station - Coal Ash**

Sample ID:	SB-4	SB-6	SB-14	SB-14				
Lab Sample ID:	252302.02	252302.03	252302.05	252302.05				
Matrix:	aqueous	aqueous	aqueous	aqueous				
Date Sampled:	11/14/22	11/14/22	11/14/22	11/14/22	**Units**	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.46**	**5.53**	**5.74**	**5.74**	SU	11/14/22	SM4500	AJG

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

252302

aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
SB-1	11/14/22 1308	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL HNO_3 (circled) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE (circled)					
SB-4	11/14/22 12:07	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL HNO_3 (circled) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE (circled)					
SB-6	11/14/22 14:09	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL HNO_3 (circled) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE (circled)					
SB-13	11/14/22 0956	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL HNO_3 (circled) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE (circled)					
SB-14	11/14/22 1151	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Fluoride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL HNO_3 (circled) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE (circled)					

aClientID Merrimack Station - Coal Ash
nProjectID 3949 **nYearMonth** 2022.11
Client (Pro Mgr) Allan Palmer
Customer Granite Shore Power
Address 431 River Road
City Bow **NH** 03304
Phone 230-7997
Fax

Results Needed by: Preferred date ____
Notes about project

ReportingOptions
☒ HC ☐ NO FAX ☐ EDD Disk
☐ Fax ☐ No partial FAX ☒ EDD emai

PO# ____
Quote# —

Ice: Y☐ N☐ **Temperature** 2.9 °C

Samples Collected by: EAI FS - TC, AG

Relinquished by	Date/Time	Received by
[signature]	11-14-22/15:35	DAF

Appendix C

Alternative Source Demonstrations

Appendix C.1

February 2022
Alternative Source Demonstration

SANBORN | HEAD
Building Trust. Engineering Success.

Mr. Allan G. Palmer
GSP Merrimack LLC
431 River Road
Bow, NH 03304

February 4, 2022
File No. 2025.12

Re: Alternative Source Demonstration
April 2021 and September 2021 Total Dissolved Solids at SB-1
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Dear Allan:

Sanborn, Head & Associates, Inc. (Sanborn Head) prepared this Alternative Source Demonstration (ASD) for the Merrimack Station Coal Ash Landfill Site (the Site) located in Bow, New Hampshire. A qualified professional engineer certification is provided in Attachment A, and this ASD was prepared in accordance with the Coal Combustion Residual (CCR) Rules (40 CFR Part 257) and is subject to the Limitations provided in Attachment B. A Locus Plan for the Site is provided as Figure 1.

INTRODUCTION

Based on the prediction interval procedure performed by Sanborn Head, a statistically significant increase (SSI) compared to background groundwater concentrations was identified at monitoring well SB-1 for total dissolved solids (TDS).[1] As such, pursuant to 40 CFR Part 257.94(e)(2), within 90 days of detecting the SSI, the owner or operator may provide a written demonstration from a qualified professional engineer that: (i) a source other than the CCR unit caused the SSI; or (ii) the SSI resulted from either an error in sampling, analysis, or statistical evaluation; or natural variation in groundwater chemistry.

Groundwater analytical data are provided in Table 1, and groundwater elevation data are provided in Table 2. The locations of the monitoring wells in relation to the landfill are indicated on the Facility Plan, Figure 2.

BACKGROUND

The TDS SSI identified at SB-1 is based on samples collected in April 2021 and a confirmatory sample collected in September 2021. Using a weight-of-evidence approach, we conclude that the SSI is not sourced from the CCR unit based on the following findings:

- TDS concentrations are less than TDS concentrations detected at the site upgradient monitoring well.
- TDS concentrations are within the range of naturally occurring concentrations.

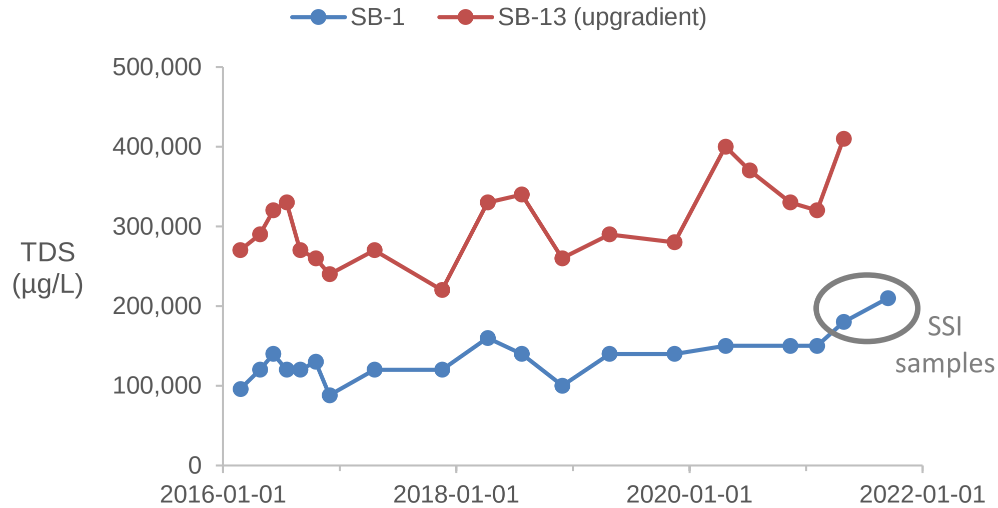
1 The April 2021 laboratory analytical data were received on June 11, 2021. Confirmatory sampling, which is used with the "1-of-2" retesting strategy, was completed in September 2021. The SSI was detected in statistical analyses completed November 9, 2021.

- TDS is a measure that encompasses other Appendix III parameters. If TDS increases because of a CCR source, then we would also expect other Appendix III parameters to increase. However, concentrations of those Appendix III analytes are consistent with historical data, indicating the TDS SSI is not sourced from CCR impacts to groundwater at SB-1.
- A comparison of major ion signatures indicate the TDS SSI is not sourced from CCR impacts to groundwater at SB-1.

SITE UPGRADIENT CONCENTRATIONS

The SB-1 SSI concentrations are less than historical TDS concentrations at the Site upgradient monitoring well SB-13. A time series plot of SB-1 and SB-13 TDS concentrations is provided below as Exhibit 1.

Exhibit 1: SB-1 TDS Concentrations Are Less Than Site Upgradient Concentrations



The SB-1 April 2021 and September 2021 TDS values constituted an SSI because the TDS concentrations were greater than previous SB-1 TDS concentrations. However, the SB-1 TDS SSI concentrations are well within the range of TDS that could be expected to occur at the site, given the higher TDS concentrations observed at the upgradient monitoring well SB-13.

NATURALLY OCCURRING AND AMBIENT CONCENTRATIONS

TDS occurs naturally in groundwater in the region through dissolution of ion-producing minerals in rock and soil. Human activities, such as road salting, agriculture, and subsurface wastewater discharge, may also contribute to TDS being present in groundwater. Road salt may contribute to variation (seasonally and with precipitation) in TDS concentrations at the Site because two major roadways, New Hampshire Route 3A and Interstate 93, are to the west and southwest (upgradient) of the Site. There is also off-site development upgradient of the Site, including a gravel pit, vehicle storage lot, and commercial/industrial buildings, which may store or use road salt. These off-site features are indicated on Figure 1. Sodium and chloride, the typical constituents of road salt, are the predominant ions in groundwater that comprise TDS for most wells at the Site, including SB-1.

TDS concentrations associated with the SB-1 SSI are within the range of naturally occurring concentrations for comparable groundwaters, as reported in local aquifer, state-wide, and regional studies summarized in Exhibit 2 below.[2,3,4] The local aquifer and state-wide USGS studies are specific to stratified drift aquifers with similar geology to the Site, and the regional study is applicable to the Site because the glacial outwash overburden at the Site is eroded from the underlying crystalline rock and has similar mineralogical composition to the aquifers in the regional USGS study. The TDS data that resulted in the SSI at SB-1 were near, but below, the maximum value detected in the small local study, and they were well within the range of TDS concentrations reported in the state and regional studies.

Exhibit 2: Comparison of Site TDS Concentrations and Literature Values

Study/Location	**TDS (µg/L)**	
SB-1 (SSI data in **bold**)	April 2021: September 2021:	**180,000** **210,000**
USEPA Secondary Maximum Contaminant Level (SMCL)	SMCL:	500,000
Site Upgradient SB-13 Data February 2016 through September 2021 [n=20]	Min: Median: Max:	220,000 305,000 410,000
Local Stratified Drift Aquifers [sample size (n)=16]	Min.: Median: Max.:	33,000 54,000 216,000
New Hampshire Stratified Drift Aquifers [n=252]	Min.: Median: Max.:	17,000 77,000 612,000
Northeast Crystalline Rock Aquifers [n=117]	Min.: Median: Max.:	29,000 126,000 876,000

See text and footnotes for references.

The SB-1 TDS concentrations were lower than the U.S. Environmental Protection Agency (USEPA) Secondary Maximum Contaminant Level (SMCL) for TDS (500,000 µg/L). The USEPA SMCL for TDS is based on aesthetic considerations for public water systems, so it is not applicable to groundwater in this situation but may be used as a reference concentration. There is no ambient groundwater quality standard for TDS in New Hampshire, but like the USEPA value, there is an SMCL of 500,000 µg/L for TDS in public water systems.

OTHER INDICATOR ANALYTES

The CCR Rules for detection monitoring (i.e., the Appendix III indicator analytes) require analysis of boron, calcium, chloride, fluoride, pH, sulfate, and TDS. TDS is a relatively general, non-targeted analysis that measures the amounts of inorganic salts and small amounts of dissolved organic matter present in the sample. TDS is a collective measure that includes the dissolved Appendix III indicator analytes boron, calcium, chloride, fluoride, and sulfate, as

---

2 U.S. Geological Survey. 1997. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Upper Merrimack River Basin, South-Central New Hampshire*; and U.S. Geological Survey. 1995. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire*.

3 U.S. Geological Survey. 1995. *Ground-Water Resources in New Hampshire: Stratified-Drift Aquifers*.

4 U.S. Department of the Interior and U.S. Geological Survey. 2012. *Quality of Water from Crystalline Rock Aquifers in New England, New Jersey, and New York, 1995-2007*.

well as other dissolved constituents (e.g., sodium, alkalinity, magnesium, potassium, and silica). The laboratory method for TDS includes filtering the sample and evaporating the water so that residual solids from the sample can be measured – laboratory TDS measurements do not distinguish between individual analytes or constituents. Compared to other Appendix III indicator analytes, such as sulfate and boron, TDS is less specific to CCR sites. Groundwater analytical data are provided in Table 1.

The TDS SSI was identified for the SB-1 because the TDS concentrations were significantly different from historical concentrations at SB-1. Concentrations of the other Appendix III indicator analytes at SB-1 were similar to historical concentrations at SB-1, and no other SSI was detected for those monitoring events. Because TDS is a collective measure that encompasses other Appendix III parameters, if TDS increases, then it is reasonable to expect to see increases in the other Appendix III parameters. However, the concentrations of the other Appendix III parameters were similar to historical data, indicating the TDS SSI is not sourced from CCR impacts to groundwater at SB-1.

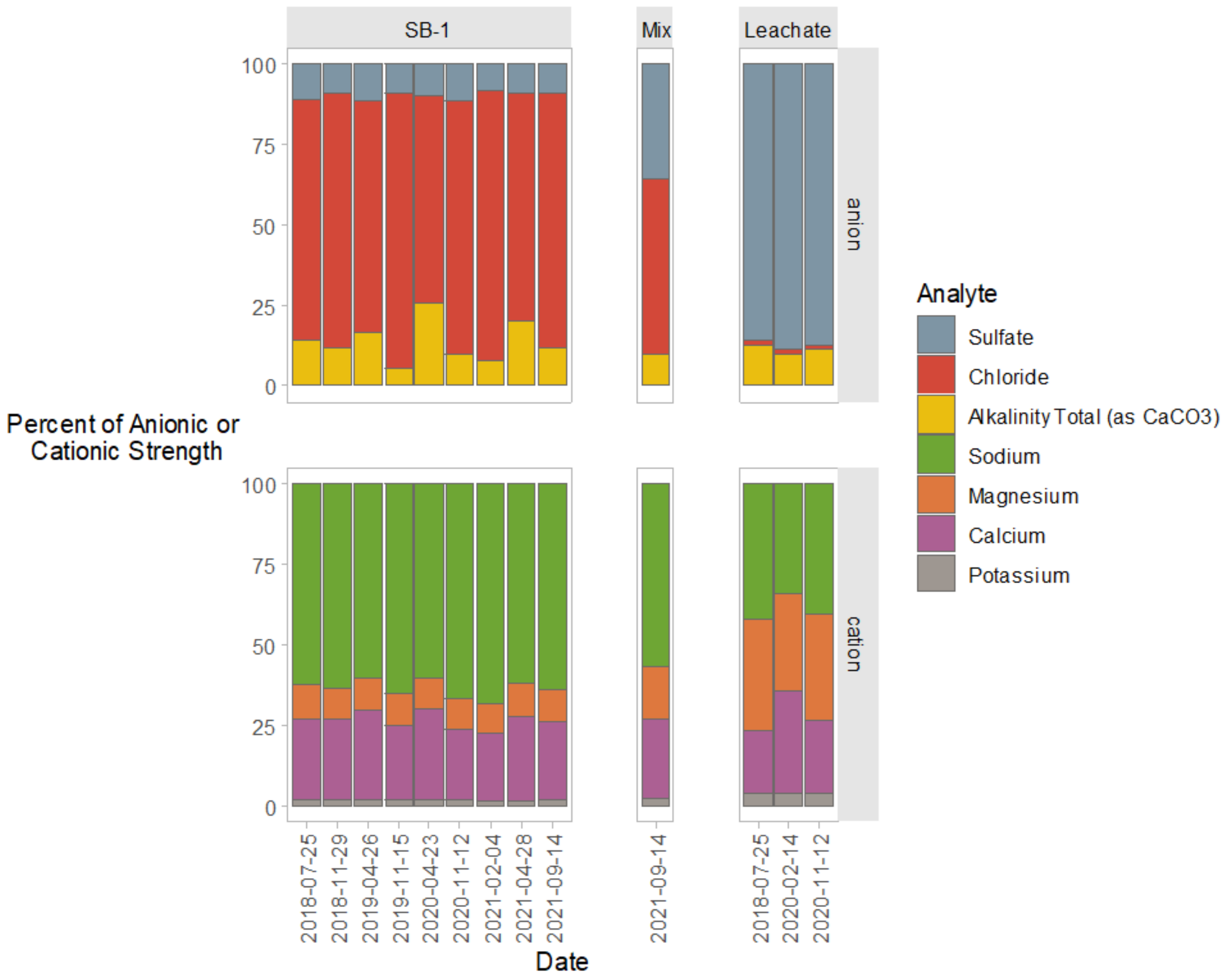
COMPARISON OF MAJOR ION SIGNATURES

Major ion chemistry was analyzed for SB-1 samples since November 2018. Leachate from the Site was also analyzed for major ion chemistry for three samples. These data are presented as plotted values below in Exhibit 3. Based on the major ion analyses, the major ion chemistry data for SB-1 is consistently a sodium – chloride water type, including the April 2021 and September 2021 samples that had TDS SSIs. The leachate is characterized as a [sodium-calcium-magnesium] – sulfate water type.

A calculated, hypothetical mix of a SB-1 background (pre-SSI) sample and a leachate sample is also shown on Exhibit 3. The major ion chemistry for the "mix" is based on the November 2020 SB-1 background sample, which has relatively low TDS, and a leachate sample, which has relatively high TDS. The ratio of background sample to leachate sample was adjusted so that the TDS concentration of the "mix" sample is equal to the TDS concentration for the September 2021 SB-1 SSI sample.[5] The "mix" sample represents a hypothetical SB-1 groundwater *if* the TDS SSI was caused by leachate impacts.

[5] The mixed water calculation was based on a mix of 98% SB-1 background (November 2020 concentrations, with 150,000 µg/L TDS) and 1.9% leachate (February 2020 concentrations, with 3,300,000 µg/L TDS). This mixture would result in 210,000 µg/L of TDS, which is the September 2021 TDS concentration for SB-1 that resulted in the SSI. I.e., 150,000 µg/L×0.98 + 3,300,000 µg/L×0.019 = 210,000 µg/L.

Exhibit 3: Major Ions Signature for SB-1 SSI Samples (April and Sept. 2021) Consistent with SB-1 Historical Data and Inconsistent with Hypothetical SB-1/Leachate Mix



Based on the ionic strengths and mixing model results presented above, the key major ion data are not indicative of impacts from leachate. Sulfate is the predominant major anion in leachate. Because sulfate levels at SB-1, including the April and September 2021 SSI samples, are consistently low and are not similar to the sulfate levels in the hypothetical mix sample, these data indicate the TDS SSI is not sourced from CCR impacts to groundwater at SB-1.

CLOSING

Based on our understanding of the information presented herein, including the Site characteristics, natural variation of regional groundwater chemistry, and the groundwater flow and groundwater chemistry monitoring data, the April 2021 and September 2021 TDS SSI at SB-1 is not sourced from the CCR unit.

Thank you for the opportunity to be of service to GSP Merrimack LLC. We look forward to continuing to work with you on this project.

Sincerely,
SANBORN, HEAD & ASSOCIATES, INC.

Harrison R. Roakes, PE
Project Manager

Eric S. Steinhauser, PE, CPESC, CPSWQ
Senior Vice President

HRR/AEA/ESS:hrr

Enclosures: Table 1 – Groundwater Analytical Results Summary
Table 2 – Groundwater Level Measurements Summary

Figure 1 – Locus Plan
Figure 2 – Facility Plan

Attachment A – Qualified Professional Engineer Certification
Attachment B – Limitations

P:\2000s\2025.12\Source Files\202202 ASD\202202 ASD.docx

TABLES

TABLE 1
Groundwater Analytical Results Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Metals															Miscellaneous Parameters							
		µg/L																			s.u	pCi/L		
		Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Radium 226	Radium 228	Radium 226+228
Drinking Water MCL		6	10	2,000	4	NS	5	NS	100	NS	15*	NS	2	NS	50	2	NS	4,000	NS	NS	NS	NS	NS	5
CCR Alt. Standards		NA	NA	NA	NA	NA	NA	NA	NA	6	15	40	NA	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-1/(AGQS)		6 ‡	5 ‡	2,000 ‡	4 ‡	6,000 ‡	5 ‡	NS ‡	100	NS ‡	15 ‡	NS	2 ‡	NS	50 ‡	2 ‡	NS	4,000	500,000	NS	NS	NS	NS	NS
GW-2		NA	NA	NA	NA	NA	NA	NS	NA	NS	NA	NS	NA	NS	NA	NA	NS	†	†	NS	NS	NS	NS	NS
SB-1	2/24/2016	<1.0	<1.0	14	<1.0	60	<1.0	7,200	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	44,000	<100	8,000	96,000	5.21	0.2 ±0.1	0.6 ±0.6	0.8 ±0.6
	4/25/2016	<1.0	<1.0	18	<1.0	100	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	1.0	<1.0	<1.0	58,000	<100	9,000	120,000	5.72	0.5 ±0.2	0.2 ±0.4	0.7 ±0.4
	6/6/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	55,000	<100	7,000	140,000	5.52	0.6 ±0.3	0.2 ±0.5	0.8 ±0.5
	7/18/2016	<1.0	<1.0	16	<1.0	70	<1.0	8,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	60,000	<100	9,000	120,000	5.35	0.4 ±0.3	0.0 ±0.6	0.4 ±0.6
	8/30/2016	<1.0	<1.0	17	<1.0	<50	<1.0	7,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	49,000	<100	7,000	120,000	5.23	0.4 ±0.3	0.3 ±0.4	0.7 ±0.4
	10/17/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	60,000	<100	6,000	130,000	5.63	0.6 ±0.4	0.0 ±0.4	0.6 ±0.4
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	62,000	<100	6,000	88,000	5.63	1.0 ±0.4	0.8 ±0.5	1.8 ±0.5
	4/19/2017	<1.0	<1.0	16	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	56,000	<100	8,000	120,000	5.81	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
	11/17/2017					50		12,000									68,000	<100	8,000	120,000	5.70			
	1/31/2018 ¢							12,000																
	4/9/2018					67		12,000									55,000	<100	10,000	160,000	5.90			
	7/25/2018 ¢							12,000									63,000		13,000	140,000	5.94			
	11/29/2018					87		13,000									66,000	<100	10,000	100,000	6.07			
	4/26/2019					100		13,000									55,000	<100	12,000	140,000	5.78			
	11/15/2019					59		11,000									68,000	<100	10,000	140,000	5.56			
	4/23/2020					70		14,000									53,000	<100	11,000	150,000	5.94			
	11/12/2020					<50		10,000									64,000	<100	13,000	150,000	5.36			
	2/4/2021 ¢							11,000									78,000		11,000	150,000	5.12			
	4/28/2021					78		14,000									62,000	<100	11,000	180,000	5.42			
	9/14/2021					58		13,000									69,000	<100	11,000	210,000	6.21			
SB-4	2/23/2016	<1.0	<1.0	14	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	95,000	<100	9,000	210,000	5.49	0.3 ±0.1	1.0 ±0.6	1.3 ±0.6
	4/25/2016	<1.0	<1.0	14	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	110,000	<100	8,000	200,000	5.32	0.3 ±0.3	0.0 ±0.4	0.3 ±0.4
	6/6/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	110,000	<100	10,000	230,000	5.62	0.2 ±0.2	0.4 ±0.5	0.6 ±0.5
	7/18/2016	<1.0	<1.0	11	<1.0	<50	<1.0	7,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	11,000	220,000	5.27	0.4 ±0.3	0.4 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	<1.0	10	<1.0	<50	<1.0	6,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	88,000	<100	12,000	210,000	5.72	0.2 ±0.2	0.0 ±0.4	0.2 ±0.4
	10/17/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	10,000	190,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
	11/29/2016	<1.0	1.0	12	<1.0	<50	<1.0	7,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	10,000	180,000	5.79	0.7 ±0.3	0.5 ±0.5	1.2 ±0.5
	4/19/2017	<1.0	<1.0	19	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	120,000	<100	9,000	260,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
	11/17/2017					<50		10,000									77,000	<100	13,000	170,000	5.80			
	4/9/2018					<50		11,000									93,000	<100	12,000	220,000	5.87			
	7/25/2018 ¢							9,800									95,000		11,000	210,000	5.68			
	11/28/2018					<50		12,000									86,000	<100	13,000	83,000	6.28			
	4/26/2019					<50		13,000									94,000	<100	11,000	190,000	5.83			
	11/15/2019					53		11,000									97,000	<100	11,000	230,000	5.75			
	2/14/2020 ¢					<50		11,000									100,000		14,000	190,000	5.85			
	4/23/2020					55		13,000									140,000	<100	11,000	260,000	5.72			
	7/8/2020 ¢					57		11,000									99,000		14,000	240,000	5.59			
	11/12/2020					60		9,600									120,000	<100	18,000	260,000	5.18			
	2/4/2021 ¢					70		8,500									100,000		20,000	240,000	5.22			
	4/28/2021					65		11,000									100,000	<100	16,000	230,000	5.71			
SB-6	2/23/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	80,000	<100	10,000	170,000	5.55	0.1 ±0.07	0.5 ±0.5	0.6 ±0.5
	4/25/2016	<1.0	<1.0	16	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	7,000	220,000	5.55	0.4 ±0.3	0.0 ±0.4	0.4 ±0.4
	6/6/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	8,000	270,000	5.40	0.5 ±0.3	0.0 ±0.5	0.5 ±0.5
	7/18/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	9,000	260,000	5.27	0.5 ±0.3	0.3 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	9,000	280,000	5.71	0.4 ±0.2	0.0 ±0.4	0.4 ±0.4
	10/17/2016	<1.0	<1.0	18	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	260,000	5.78	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	130,000	<100	9,000	230,000	5.77	0.5 ±0.2	0.8 ±0.5	1.3 ±0.5
	4/19/2017	<1.0	<1.0	13	<1.1	<51	<1.1	7,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	9,000	190,000	5.68	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
	11/17/2017					<50		9,900									130,000	<100	11,000	230,000	5.60			
	4/9/2018					<50		7,900									120,000	<100	9,500	240,000	5.57			
	7/25/2018 ¢							11,000									180,000		12,000	310,000	5.44			
	11/28/2018					<50		11,000									150,000	<100	11,000	140,000	5.86			
	4/26/2019					84		13,000									150,000	<100	14,000	210,000	5.78			
	7/11/2019 ¢					80		14,000									170,000		15,000	330,000	5.84			
	11/15/2019					52		10,000									140,000	<100	13,000	280,000	5.75			
	2/14/2020 ¢					<50		5,100									79,000		15,000	130,000	5.73			
	4/23/2020					<50		12,000									160,000	<100	8,100	270,000	5.56			
	11/12/2020					<50		12,000									180,000	<100	9,600	330,000	5.37			
	4/28/2021					<50		11,000									150,000	<100	6,700	290,000	5.58			
SB-13	2/23/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	160,000	<100	6,000	270,000	5.34	0.6 ±0.1	0.3 ±0.6	0.9±0.6
	4/25/2016	<1.0	<1.0	17	<1.0	<50	<1.0	8,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	160,000	<100	7,000	290,000	5.48	0.4 ±0.3	0.1 ±0.4	0.5 ±0.4
	6/6/2016	<1.0	<1.0	20	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	170,000	<100	7,000	320,000	5.50	0.8 ±0.3	0.0 ±0.5	0.8 ±0.5
	7/18/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	160,000	<100	8,000	330,000	5.27	0.8 ±0.3	0.0 ±0.6	0.8 ±0.6
	8/30/2016	<1.0	1.0	20	<1.0	<50	<1.0	8,100	2.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	270,000	5.35	0.8 ±0.3	0.6 ±0.4	1.4 ±0.4
	10/17/2016	<1.0	<1.0	15	<1.0	<50	<1.0	8,800	2.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	260,000	5.06	0.7 ±0.4	0.6 ±0.5	1.3 ±0.5
	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	7,400	1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	8,000	240,000	5.71	0.6 ±0.3	0.7 ±0.5	1.3 ±0.5
	4/19/2017	<1.0	<1.0	16	<1.1	<51	<1.1	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	130,000	<100	8,000	270,000	5.56	0.9 ±0.3	0.3 ±0.5	1.2 ±0.5
	11/17/2017					<50		7,000									110,000	<100	9,000	220,000	5.80			
	4/9/2018					<50		11,000									170,000	<100	8,000	330,000	5.81			
	7/25/2018 ¢							10,000									190,000		8,700	340,000	5.69			
	11/28/2018					<50		13,000									200,000	<100	7,200	260,000	5.77			
	4/26/2019					<50		14,000									200,000	<100	7,100	290,000	5.53			
	11/15/2019					<50		8,100									140,000	<100	8,100	280,000	5.82			
	4/23/2020					<50		14,000									230,000	<100	6,500	400,000	5.47			
	7/8/2020 ¢					<50		14,000									210,000		6,900	370,000	5.41			
	11/12/2020					<50		11,000									180,000	<100	8,000	330,000	4.96			
	2/4/2021 ¢					< 50		11,000									180,000		6,700	320,000	5.32			
	4/28/2021					<50		14,000									240,000	<100	5,900	410,000	5.31			
SB-14	2/24/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,100	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	16,000	<100	4,000	56,000	5.05	0.2 ±0.08	0.0 ±0.5	0.2 ±0.5
	4/25/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	11,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	58,000	<100	3,000	140,000	5.62	0.8 ±0.5	0.2 ±0.1	1.0 ±0.5
	6/6/2016	<1.0	<1.0	6.0	<1.0	<50	<1.0	7,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	32,000	<100	4,000	100,000	5.39	0.5 ±0.2	0.2 ±0.5	0.7 ±0.5
	7/18/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	21,000	<100	5,000	68,000	5.31	0.2 ±0.2	0.3 ±0.5	0.5 ±0.5
	8/30/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	14,000	<100	4,000	71,000	5.81	0.4 ±0.3	0.4 ±0.5	0.8 ±0.5
	10/17/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	4,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	11,000	<100	4,000	29,000	5.55	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
	11/29/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	2,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	7,000	<100	4,000	12,000	5.19	0.2 ±0.4	0.2 ±0.5	0.4 ±0.5
	4/19/2017	<1.0	<1.0	10	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	56,000	<100	5,000	120,000	5.59	0.7 ±0.3	0.1 ±0.5	0.8 ±0.5
	11/17/2017					<50		8,000									18,000	<100	5,000	59,000	5.60			
	4/9/2018					<50		4,200									14,000	<100	8,400	80,000	5.76			
	7/25/2018 ¢							5,100									9,800		6,100	56,000	5.61			
	11/28/2018					<50		4,500									7,800	<100	6,300	<5,000	5.96			
	4/26/2019					<50		8,700									19,000	<100	3,700	91,000	5.74			
	11/15/2019					<50		5,000									12,000	<100	7,800	69,000	5.94			
	4/23/2020					<50		5,500									9,200	<100	5,500	52,000	5.63			
	11/12/2020					<50		4,000									4,700	<100	15,000	68,000	5.10			
	2/4/2021 ¢							7,900									34,000		6,000	95,000	5.30			
	4/28/2021					<50		3,300									4,000	<100	7,100	42,000	5.37			

Notes:

1. Samples were collected by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire on the dates indicated and analyzed by EAI for select metals by USEPA Method 6020. Additional analysis for select wet chemistry parameters were completed by EAI. Analysis for radium 226 and 228 was completed by KNL Environmental Testing, Inc., of Tampa, Florida. Analysis for lithium was completed by SGS Accutest, of Marlborough, Massachussets (Feb. 2016) and Katahdin Analytical Services, of Scarborough, Maine (April 2016 through October 2016).

2. Concentrations are presented in micrograms per liter (µg/L), which are equivalent to parts per billion (ppb), or they are presented in picoCuries per liter (pCi/L) or pH standard units.

3. "<" indicates the analyte was not detected above the indicated laboratory reporting limit.
A blank indicates the sample was not analyzed for this parameter.

4. "GW-1" and "GW-2" 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 equivalent to the Ambient Groundwater Quality Standards (AGQSs) promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water. The GW-2 Groundwater Standards apply to groundwater as a potential source of indoor air contamination.

5. "Drinking Water MCLs" are from the United States Environmental Protection Agency (EPA) website (accessed March 22, 2016). The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are enforceable standards for drinking water systems.
"CCR Alt. Standards" were codified in 40 CFR Part 257.95(h)(2) for cobalt, lead, lithium, and molybdenum. These are alternative risk-based standards for the four constituents without MCLs that may require establishment of a groundwater protection standard under the coal combustion residuals (CCR) rules 40 CFR Part 257(h).

6. "*" indicates an MCL value is not currently available, and the listed value is an action level.
"†" indicates the RCMP lists the value as not currently available.
"‡" indicates the value provided is typically applied to field-filtered samples (i.e., dissolved analytes) for overburden monitoring wells.
"NA" indicates the RCMP lists the value as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the retesting program for identifying statistically significant increases (SSIs).

TABLE 2
Groundwater Level Measurements Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Date	Depths and elevations in feet.																
	SB-1			SB-4			SB-6			SB-13			SB-14			Inferred General Groundwater Flow Rate (feet/day)	Inferred General Groundwater Flow Direction
	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation		
Feb-16	240.85	33.82	207.03	274.26	67.36	206.90	268.77	61.84	206.93	219.86	11.83	208.03	242.70	34.88	207.82	0.5 - 2.7	Northeast
Apr-16	240.85	32.19	208.66	274.26	65.63	208.63	268.77	60.07	208.70	219.86	10.16	209.70	242.70	33.13	209.57	0.5 - 2.5	Northeast
Jun-16	240.85	31.84	209.01	274.26	66.24	208.02	268.77	60.80	207.97	219.86	11.11	208.75	242.70	33.93	208.77	0.4 - 1.9	East
Jul-16	240.85	33.88	206.97	274.26	67.30	206.96	268.77	62.07	206.70	219.86	12.41	207.45	242.70	35.10	207.60	0.4 - 1.9	Northeast
Aug-16	240.85	35.09	205.76	274.26	68.54	205.72	268.77	63.19	205.58	219.86	13.76	206.10	242.70	36.39	206.31	0.3 - 1.4	Northeast
Oct-16	240.85	36.20	204.65	274.26	69.68	204.58	268.77	64.42	204.35	219.86	13.92	205.94	242.70	37.58	205.12	0.8 - 3.9	North-Northeast
Nov-16	240.85	36.40	204.45	274.26	69.93	204.33	268.77	64.69	204.08	219.86	15.14	204.72	242.70	37.80	204.90	0.3 - 1.6	East-Northeast
Apr-17	240.85	32.27	208.58	274.26	65.82	208.44	268.77	60.04	208.73	219.86	9.58	210.28	242.70	32.99	209.71	0.8 - 3.8	North-Northeast
Nov-17	240.85	32.87	207.98	274.26	66.39	207.87	268.77	60.97	207.80	219.86	11.33	208.53	242.70	34.08	208.62	0.4 - 1.8	Northeast
Apr-18	240.85	31.13	209.72	274.26	64.58	209.68	268.77	58.93	209.84	219.86	8.74	211.12	242.70	31.94	210.76	0.6 - 3.2	North-Northeast
Jul-18	240.85	32.60	208.25	274.26	66.01	208.25	268.77	60.84	207.93	219.86	11.13	208.73	242.70	33.78	208.92	0.4 - 2.0	Northeast
Nov-18	240.85	29.99	210.86	274.26	63.59	210.67	268.77	57.92	210.85	219.86	7.66	212.20	242.70	30.82	211.88	0.7 - 3.3	Northeast
Apr-19	240.85	29.83	211.02	274.26	63.34	210.92	268.77	57.60	211.17	219.86	7.51	212.35	242.70	30.72	211.98	0.6 - 2.9	North-Northeast
Jul-19	–	–	–	–	–	–	268.77	58.71	210.06	–	–	–	–	–	–	–	–
Nov-19	240.85	34.48	206.37	274.26	67.96	206.30	268.77	62.66	206.11	219.86	13.21	206.65	242.70	35.85	206.85	0.3 - 1.3	East-Northeast
Feb-20	–	–	–	274.26	66.67	207.59	268.77	61.12	207.65	–	–	–	–	–	–	–	–
Apr-20	240.85	31.84	209.01	274.26	65.34	208.92	268.77	59.73	209.04	219.86	9.62	210.24	242.70	32.75	209.95	0.6 - 3.0	North-Northeast
Jul-20	–	–	–	274.26	66.00	208.26	–	–	–	219.86	11.00	208.86	–	–	–	–	–
Nov-20	240.85	35.72	205.13	274.26	69.23	205.03	268.77	63.92	204.85	219.86	14.48	205.38	242.70	37.09	205.61	0.3 - 1.3	East-Northeast
Feb-21	240.85	33.85	207.00	274.26	67.36	206.90	–	–	–	219.86	12.12	207.74	242.70	34.88	207.82	–	–
Apr-21	240.85	33.37	207.48	274.26	66.88	207.38	268.77	61.31	207.46	219.86	11.43	208.43	242.70	34.38	208.32	0.5 - 2.4	Northeast
Sep-21	240.85	31.11	209.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–

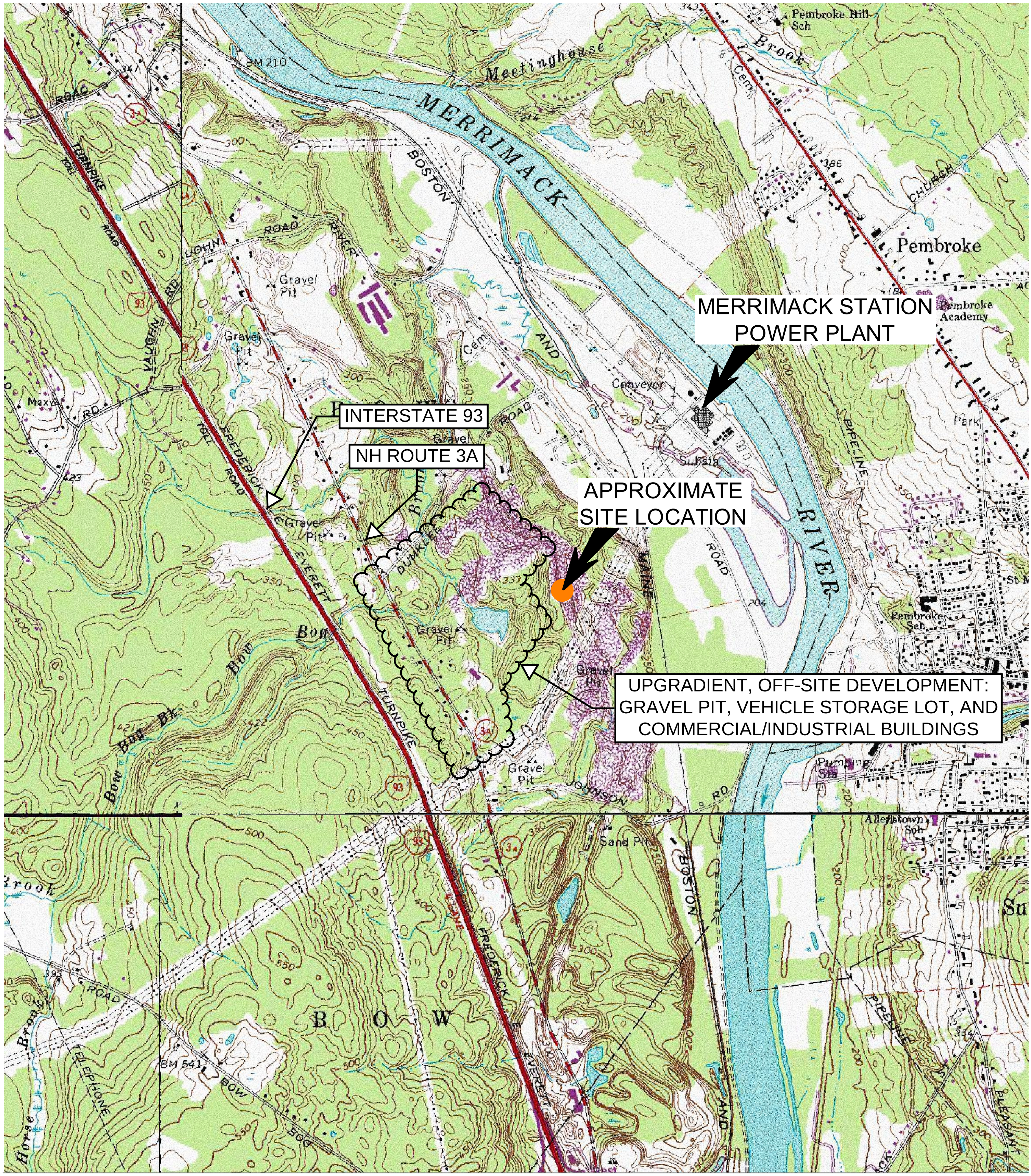
Notes:

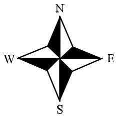
1. Depths to water were obtained from information provided in laboratory reports and field sampling sheets prepared by Eastern Analytical, Inc.

2. Inferred general groundwater flow rates and flow directions are approximate and are based on the limited hydrogeologic and groundwater elevation data available. Other interpretations are possible and actual conditions may vary from those indicated. Note that groundwater elevations, directions, and rates may change due to seasonal or other variations in temperature, precipitation, runoff, or other factors.

3. Approximate groundwater flow rates were calculated using an assumed saturated hydraulic conductivity of 100 to 500 feet per day, and an assumed porosity of 39%. Assumptions are consistent with values typical of medium-grained, clean sand. The calculated groundwater flow rate is equivalent to the average interstitial velocity or the seepage velocity.

FIGURES





NOTES:

BASE MAP TAKEN FROM 7.5 MINUTE USGS QUADRANGLE MAP: BOW, NEW HAMPSHIRE 1967 (PHOTO REVISED 1998)

Drawn By: E. Wright
Designed By: H. Roakes
Reviewed By: Steinhauser
Project No: 2025.10
Date: January 2022

SANBORN HEAD

Figure 1

Locus Plan

Alternative Source Demonstration
SB-1 Total Dissolved Solids

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

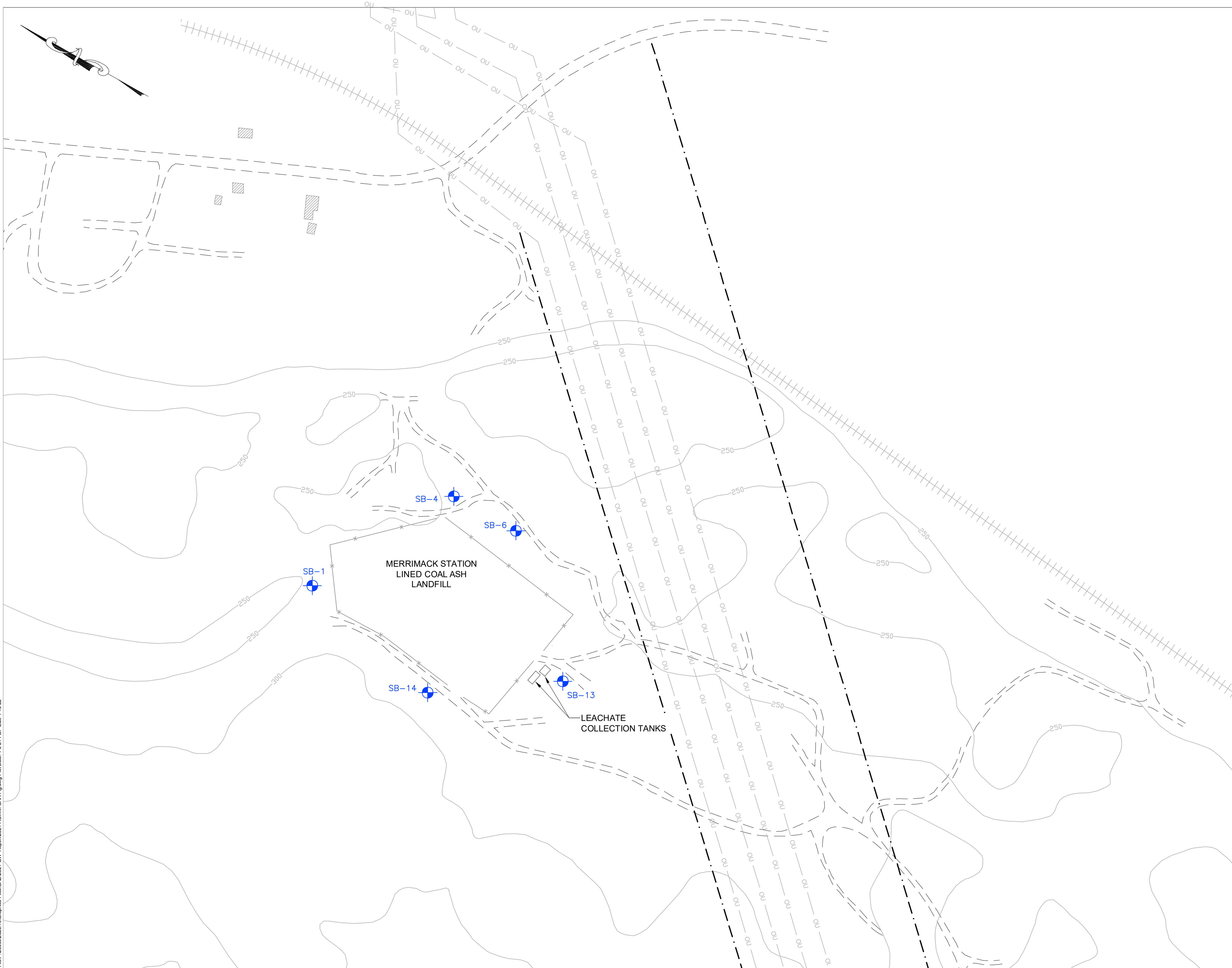


Figure 2

Facility Plan

Alternative Source Demonstration
SB-1 Total Dissolved Solids

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: E. Wright
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.12
Date: January 2022

Notes

1. The base map was developed from a drawing prepared by Public Service Company of New Hampshire's Engineering Division entitled, "Area Plan, Merrimack Station, Bow, N.H." The drawing was dated 5/1/90 and was last revised on 6/28/95.
2. The location of the landfill and the site features shown should be considered approximate.

Legend

- SB-4 Monitoring Well
- Right-Of-Way
- Fence
- Overhead Utilities (OU)
- Elevation Contour (250)

150' 75' 0 150' 300' Feet

SANBORN HEAD

ATTACHMENT A

ATTACHMENT A
QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I certify that the information in this alternative source demonstration (ASD) report, dated February 4, 2022 (the "Report"), is accurate, subject to the assumptions and limitations contained within the Report. The ASD report was prepared by Sanborn, Head & Associates, Inc. for the Merrimack Station Coal Ash Landfill site located in Bow, New Hampshire.

Harrison R. Roakes
Printed Name of Licensed Professional Engineer

Signature

15920	New Hampshire	February 4, 2022
License Number	Licensing State	Date

P:\2000s\2025.12\Source Files\202202 ASD\Att A - Certification\Attachment A - Certification.docx

ATTACHMENT B

ATTACHMENT B
LIMITATIONS

1. The conclusions and recommendations described in this report are based in part on the data obtained from a limited number of groundwater samples from widely-spaced monitoring locations. The monitoring locations indicate conditions only at the specific locations and times, and only to the depths sampled. They do not necessarily reflect variations that may exist between such locations, and the nature and extent of variations between these monitoring locations may not become evident until further study or remediation is initiated. The validity of the conclusions is based in part on assumptions Sanborn Head has made about conditions at the site. If conditions different from those described become evident, it will be necessary to re-evaluate the conclusions of this report.

2. Water level measurements were made in the monitoring well locations at times and under conditions stated within the report. Fluctuations in the levels of the groundwater may occur due to variations in precipitation and other factors not evident at the time measurements were made.

3. Quantitative laboratory analyses were performed as noted within the report. Additional analytes not searched for during the current study may be present in groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Additionally, variations in the types and concentrations of analytes and variations in their distributions within the groundwater may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.

4. The conclusions and recommendations contained in this report are based in part upon various types of chemical data as well as historical and hydrogeologic information developed during previous studies. While Sanborn Head reviewed the data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions, and recommendations presented herein should be modified accordingly.

5. This report was prepared for the exclusive use of GSP Merrimack LLC (GSP) for specific application for 40 CFR Part 257.90 compliance for GSP's Merrimack Station Coal Ash landfill in Bow, New Hampshire, and was prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

P:\2000s\2025.12\Source Files\202202 ASD\Att B - Limitations\Limitations.docx

Appendix C.2

May 2022
Alternative Source Demonstration

SANBORN | HEAD
Building Trust. Engineering Success.

Mr. Allan G. Palmer
GSP Merrimack LLC
431 River Road
Bow, NH 03304

May 31, 2022
File No. 2025.13

Re: Alternative Source Demonstration
November 2021 TDS and Chloride
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Dear Allan:

Sanborn, Head & Associates, Inc. (Sanborn Head) prepared this Alternative Source Demonstration (ASD) for the Merrimack Station Coal Ash Landfill Site (the Site) located in Bow, New Hampshire. A qualified professional engineer certification is provided in Attachment A. This ASD was prepared in accordance with the Coal Combustion Residual (CCR) Rules (40 CFR Part 257) and is subject to the Limitations provided in Attachment B. A Locus Plan for the Site is provided as Figure 1.

INTRODUCTION

Based on the prediction interval procedure performed by Sanborn Head, statistically significant increases (SSIs) compared to background groundwater concentrations were identified for several monitoring well and analyte pairs: total dissolved solids (TDS) at monitoring wells SB-1, SB-4, and SB-6; and chloride at monitoring wells SB-1 and SB-6.[1] As such, pursuant to 40 CFR Part 257.94(e)(2), within 90 days of detecting the SSI, the owner or operator may provide a written demonstration from a qualified professional engineer that: (i) a source other than the CCR unit caused the SSI; or (ii) the SSI resulted from either an error in sampling, analysis, or statistical evaluation; or natural variation in groundwater chemistry.

Groundwater analytical data are provided in Table 1, and groundwater elevation data are provided in Table 2. The locations of the monitoring wells in relation to the landfill are indicated on the Facility Plan, Figure 2.

BACKGROUND

The TDS and chloride SSIs are based on samples collected in November 2021. Using a weight-of-evidence approach, we conclude that the SSIs are not sourced from the CCR unit based on the following findings:

---

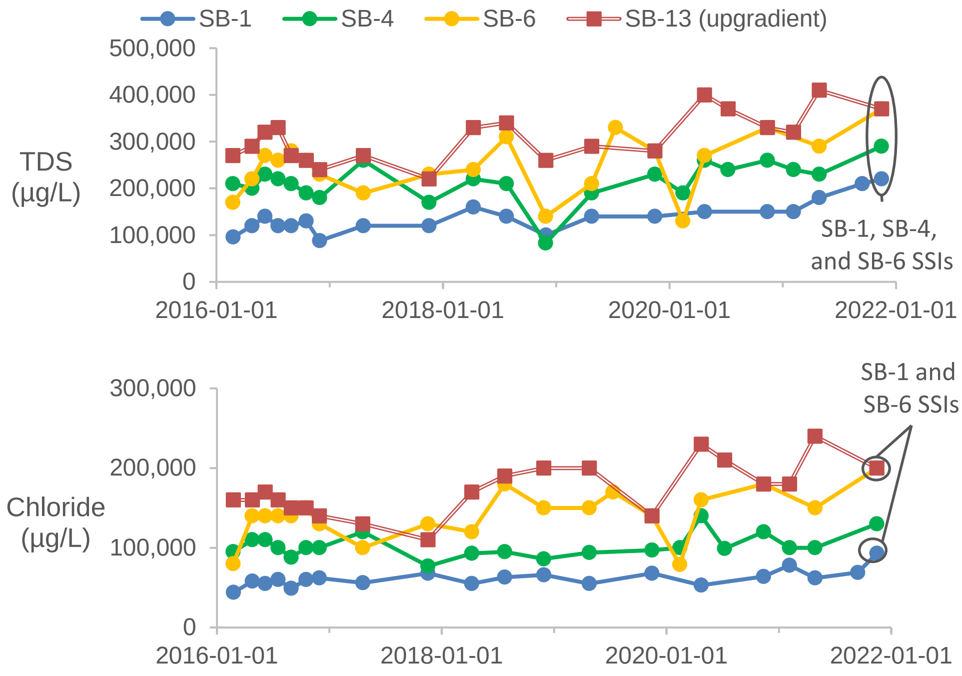
[1] The November 2021 laboratory analytical data were received on December 8, 2021. Confirmatory sampling, which may be used with the "1-of-2" retesting strategy, was elected to not be completed, and the SSI was detected in statistical analyses completed March 2, 2022.

- TDS and chloride concentrations are similar to or less than TDS and chloride concentrations detected at the Site upgradient monitoring well.
- TDS and chloride concentrations are within the range of naturally occurring concentrations.
- Compared to other Appendix III indicator analytes, such as sulfate and boron, TDS and chloride are less specific to CCR sites. Concentrations of the other Appendix III indicator analytes at SB-1, SB-4, and SB-6 were similar to historical concentrations. Because the TDS SSIs are largely from chloride rather than other Appendix III parameters, they are not indicative of CCR impacts to groundwater at SB-1, SB-4, and SB-6.
- A comparison of major ion signatures indicates the TDS and chloride SSIs are not sourced from CCR impacts to groundwater at SB-1, SB-4, and SB-6.

SITE UPGRADIENT CONCENTRATIONS

Time series plots of TDS and chloride concentrations for SB-1, SB-4, SB-6, and upgradient SB-13 are provided below as Exhibit 1. The SB-1, SB-4, and SB-6 SSI concentrations are similar to or less than historical TDS and chloride concentrations at the Site upgradient monitoring well SB-13.

Exhibit 1: SB-1, SB-4, and SB-6 TDS and Chloride Concentrations Compared to Site Upgradient Concentrations



The November 2021 TDS and chloride SSIs were identified as SSIs because they were slightly higher concentrations than previously detected at the respective locations (e.g., the November 2021 TDS concentration at SB-1 was a new maximum for that location). However, the TDS and chloride SSI concentrations are well within the range of concentrations that could be expected to occur at the Site, given the same or higher TDS and chloride concentrations observed at the upgradient monitoring well SB-13.

NATURALLY OCCURRING AND AMBIENT CONCENTRATIONS

TDS and chloride occur naturally in groundwater in the region through dissolution of ion-producing minerals in rock and soil. Human activities, such as road salting, agriculture, and subsurface wastewater discharge, also contribute to TDS and chloride concentrations in groundwater.

Sodium and chloride, the typical constituents of road salt, are the predominant ions in groundwater that comprise TDS for most wells at the Site, including SB-1, SB-4, SB-6, and upgradient SB-13. Road salt may contribute to variation (seasonally and with precipitation) in TDS and chloride concentrations at the Site because two major roadways, New Hampshire Route 3A and Interstate 93, are to the west and southwest (upgradient) of the Site. There is also off-site development upgradient of the Site, including a gravel pit, vehicle storage lots, roadways, and commercial/industrial buildings, which are likely to store or use road salt. These off-site features are indicated on Figure 1.

Additionally, the use of calcium chloride for dust control on gravel roads around the Site was permitted with the New Hampshire Department of Environmental Services in 2001.[2] The period and extent of calcium chloride use at or around the Site is uncertain. Sodium chloride salt may also have been applied or may have been carried onto gravel roads via truck traffic around the Site through years of sand and gravel mining and Site operations.

The TDS and chloride SSI concentrations are within the range of naturally occurring or ambient concentrations for comparable groundwaters, as reported in local aquifer, state-wide, and regional studies summarized in Exhibit 2 below.[3,4,5] The local aquifer and state-wide USGS studies are specific to stratified drift aquifers with similar geology to the Site, and the regional study is applicable to the Site because the glacial outwash overburden at the Site is eroded from the underlying crystalline rock and has similar mineralogical composition to the aquifers in the regional USGS study. The TDS and chloride SSI concentrations at SB-1, SB-4, and SB-6 were mostly greater than the maximum values detected in the small local study,

2 North American Reserve. May 11, 2001. *Notification to Apply Calcium Chloride as Dust Control Agent;* and New Hampshire Department of Environmental Services. May 14, 2001. *Bow – PSNH Pit, Manchester Sand & Gravel, Johnson Road, Nondomestic Discharge Registration (DES# 198400065)*.

3 U.S. Geological Survey. 1997. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Upper Merrimack River Basin, South-Central New Hampshire*; and U.S. Geological Survey. 1995. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire*.

4 U.S. Geological Survey. 1995. *Ground-Water Resources in New Hampshire: Stratified-Drift Aquifers*.

5 U.S. Department of the Interior and U.S. Geological Survey. 2012. *Quality of Water from Crystalline Rock Aquifers in New England, New Jersey, and New York, 1995-2007*.

but they were well within the range of TDS and chloride concentrations reported in the state and regional studies.

Exhibit 2: Comparison of Site TDS and Chloride Concentrations and Literature Values

Study/Location	TDS (µg/L)		Chloride (µg/L)	
SB-1 (SSI data in **bold**)	November 2021:	**220,000**	September 2021: November 2021:	**93,000**
SB-4 (SSI data in **bold**)	November 2021:	**290,000**	November 2021:	130,000
SB-6 (SSI data in **bold**)	November 2021:	**370,000**	November 2021:	**200,000**
USEPA Secondary Maximum Contaminant Level (SMCL)	SMCL:	500,000	SMCL:	250,000
Site Upgradient SB-13 Data February 2016 through November 2021 [sample size (n)=20]	Min: Median: Max:	220,000 305,000 410,000	Min: Median: Max:	110,000 170,000 240,000
Local Stratified Drift Aquifers [n=16]	Minimum: Median: Maximum:	33,000 54,000 216,000	Minimum: Median: Maximum:	1,500 7,450 120,000
New Hampshire Stratified Drift Aquifers [n=252 for TDS, n=256 for chloride]	Minimum: Median: Maximum:	17,000 77,000 612,000	Minimum: Median: Maximum:	300 10,000 300,000
Northeast Crystalline Rock Aquifers [n=117 for TDS, n=1,867 for chloride]	Minimum: Median: 90th percentile: Maximum:	29,000 126,000 323,000 876,000	Minimum: Median: 90th percentile: Maximum:	<2,500 17,000 117,000 1,800,000

See text and footnotes for references.

The SB-1, SB-4, and SB-6 SSI concentrations were lower than the U.S. Environmental Protection Agency (USEPA) Secondary Maximum Contaminant Level (SMCL) for TDS (500,000 µg/L) and chloride (250,000 µg/L). The USEPA SMCL for TDS and chloride are based on aesthetic and corrosion considerations for public water systems, so it is not applicable to groundwater in this situation but may be used as a reference concentration. Neither TDS nor chloride have ambient groundwater quality standards in New Hampshire, but like the USEPA value, there is an SMCL of 500,000 µg/L for TDS and 250,000 µg/L for chloride in public water systems.

OTHER INDICATOR ANALYTES

The CCR Rules for detection monitoring require analysis of boron, calcium, chloride, fluoride, pH, sulfate, and TDS (i.e., the Appendix III indicator analytes). Compared to other Appendix III indicator analytes, such as sulfate and boron, TDS and chloride are less specific to CCR sites, as discussed below.

TDS is a relatively general, non-targeted analysis that measures the amounts of inorganic salts and small amounts of dissolved organic matter present in the sample. TDS is a collective measure that includes the dissolved Appendix III indicator analytes boron, calcium, chloride, fluoride, and sulfate, as well as other dissolved constituents (e.g., sodium, alkalinity, magnesium, potassium, and silica). The laboratory method for TDS includes filtering the sample and evaporating the water so that residual solids from the sample can be measured;

laboratory TDS measurements do not distinguish between individual analytes or constituents.

As discussed in the section above, in respect to naturally occurring and ambient concentrations, chloride concentrations in groundwater may be affected by a variety of human activities. Activities such as road salting and subsurface wastewater discharge may include the use of chloride-containing salts, so those impact signatures can have strong chloride signatures. In contrast, chloride concentrations in leachate from the Site contributes less than 2 percent of TDS in leachate (chloride concentrations range from about 35 to 76 mg/L, and TDS concentrations range from about 3,300 to 7,900 mg/L). With such a weak chloride signature in leachate, increases in TDS associated with chloride are not an indicator of Site impacts.

An analysis of chloride contributions to TDS SSIs, shown in Exhibit 3, indicates that chloride constituted about 30 to 50 percent of the November 2021 TDS increases. Calcium and sulfate, which are other major ion Appendix III indicator analytes, either did not contribute to or subtracted from the TDS increase. These observations implicate chloride as an underlying source of the November 2021 TDS SSIs. Concentrations of the other Appendix III indicator analytes were similar to historical concentrations, and no other SSIs were detected in the November 2021 monitoring event.

Exhibit 3: Analysis of Chloride Contributions to TDS SSIs

		SB-1	SB-4	SB-6	SB-13
November 2020 Background Concentrations (µg/L)	Calcium + Sulfate	23,000	27,600	21,600	19,000
	Chloride	64,000	120,000	180,000	180,000
	TDS	150,000	260,000	330,000	330,000
November 2021 Concentrations (µg/L)	Calcium + Sulfate	23,600	23,000	20,800	18,900
	Chloride	93,000	130,000	200,000	200,000
	TDS	220,000	290,000	370,000	370,000
Concentration Change (µg/L)	Calcium + Sulfate	+600	-4,600	-800	-100
	Chloride	+29,000	+10,000	+20,000	+20,000
	TDS	+70,000	+30,000	+40,000	+40,000
Percent of TDS Change	**Calcium + Sulfate**	**+1%**	**-15%**	**-2%**	**0%**
	Chloride	**+41%**	**+33%**	**+50%**	**+50%**

The November 2020 sampling event was selected for background comparison because it is a recent sampling event with neither chloride nor TDS SSIs.
"Percent of TDS Change" is calculated by dividing the change in analyte(s) by the change in TDS.

Because the TDS SSIs are largely from chloride rather than other Appendix III parameters, the SSIs are not indicative of CCR impacts to groundwater.

COMPARISON OF MAJOR ION SIGNATURES

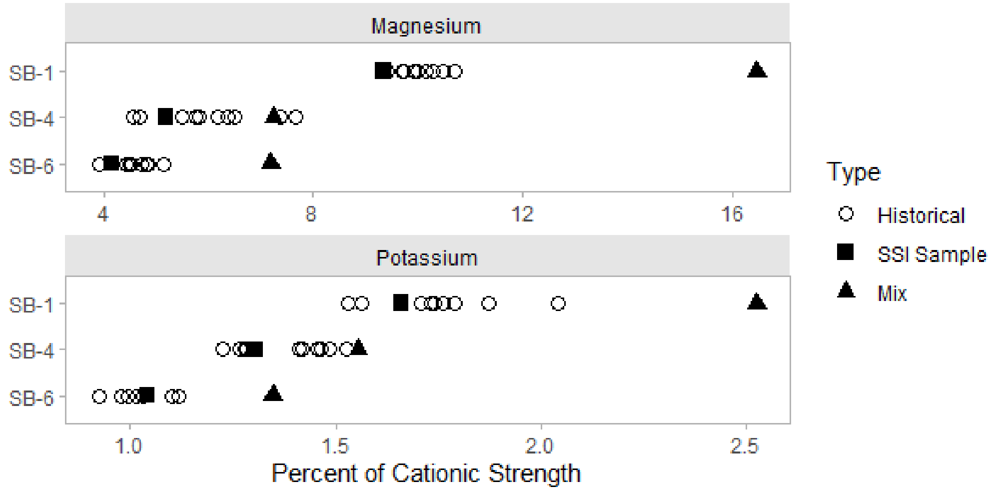
Major ion chemistry was analyzed for samples since July 2018. Leachate from the Site was also analyzed for major ion chemistry for three samples. These data are presented as plotted values in Figures 3, 4, and 5. The major ion chemistry data show that SB-1, SB-4, and SB-6 samples are consistently sodium – chloride water types, including the November 2021 samples that had TDS and chloride SSIs. The leachate is characterized as a [sodium-calcium-magnesium] – sulfate water type.

A calculated, hypothetical mix of background (pre-SSI) samples and a leachate sample are also shown in Figure 3, 4, and 5. The major ion chemistry for the "mix" samples is based on the November 2020 background samples, which have relatively low TDS, and a leachate sample, which has relatively high TDS. The ratio of background sample for each well to leachate sample was adjusted so that the TDS concentration of the "mix" sample is equal to the TDS concentration for the November 2021 TDS SSI sample for that respective well.[6] For each well, the "mix" sample represents a hypothetical SSI groundwater sample *if* the TDS SSI was caused by leachate impacts.

Sulfate is the predominant major anion in leachate and is not a predominant major anion in the Site groundwater, so the hypothetical mix sample shows increased sulfate levels over the background groundwater samples. Because sulfate levels at SB-1, SB-4, and SB-6, including November 2021 SSI samples, are consistently low and are not similar to the sulfate levels in the hypothetical mix sample, these data indicate the TDS and chloride SSIs are not sourced from CCR impacts to groundwater.

For cationic signatures, the leachate has more magnesium and potassium than the Site groundwater. The magnesium and the potassium levels for historical data, the November 2021 SSI data, and the hypothetical mix samples are shown in Exhibit 4 below. The SSI data are consistent with historical data and trend towards overall lower magnesium and potassium levels. This pattern in the SSI data is not consistent with the mix samples, which show higher magnesium and potassium (especially for SB-1 and SB-6).

Exhibit 4: Magnesium and Potassium Signatures



[6] For example, the mixed water calculation was based on a mix of about 98% SB-1 background (November 2020 concentrations, with 150,000 µg/L TDS) and 1.9% leachate (February 2020 concentrations, with 3,300,000 µg/L TDS). This mixture would result in 220,000 µg/L of TDS, which is the November 2021 TDS concentration for SB-1 that resulted in the SSI, i.e., (150,000 µg/L×0.978) + (3,300,000 µg/L×0.022) = 220,000 µg/L. This same approach was repeated for SB-4 and SB-6 using the data from those respective wells.

Based on the contrasting ionic signatures between the hypothetical mix samples and the November 2021 SSI samples, the mixing model results are not indicative of impacts from leachate.

CLOSING

Based on our understanding of the information presented herein, including the Site characteristics, natural variation of regional groundwater chemistry, and the groundwater flow and groundwater chemistry monitoring data, the November 2021 TDS and chloride SSIs are not sourced from the CCR unit.

Thank you for the opportunity to be of service to GSP Merrimack LLC. We look forward to continuing to work with you on this project.

Sincerely,
SANBORN, HEAD & ASSOCIATES, INC.

Harrison R. Roakes, PE
Project Manager

Eric S. Steinhauser, PE, CPESC, CPSWQ
Senior Vice President

HRR/ESS:hrr

Enclosures: Table 1 – Groundwater Analytical Results Summary
Table 2 – Groundwater Level Measurements Summary

Figure 1 – Locus Plan
Figure 2 – Facility Plan
Figure 3 – SB-1 Major Ion Signature
Figure 4 – SB-4 Major Ion Signature
Figure 5 – SB-6 Major Ion Signature

Attachment A – Qualified Professional Engineer Certification
Attachment B – Limitations

P:\2000s\2025.13\Source Files\202205 ASD\202205 ASD.docx

TABLES

TABLE 1
Groundwater Analytical Results Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Metals µg/L															Miscellaneous Parameters							
																					s.u	pCi/L		
		Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Radium 226	Radium 228	Radium 226+228
Drinking Water MCL		6	5	2,000	4	NS	5	NS	100	NS	15*	NS	2	NS	50	2	NS	4,000	NS	NS	NS	NS	NS	5
CCR Alt. Standards		NA	NA	NA	NA	NA	NA	NA	NA	6	15	40	NA	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-1/(AGQS)		6 ‡	5 ‡	2,000 ‡	4 ‡	6,000 ‡	5 ‡	NS ‡	100	NS ‡	15 ‡	NS	2 ‡	NS	50 ‡	2 ‡	NS	4,000	500,000	NS	NS	NS	NS	NS
GW-2		NA	NA	NA	NA	NA	NA	NS	NA	NS	NA	NS	NA	NS	NA	NA	NS	†	†	NS	NS	NS	NS	NS
SB-1	2/24/2016	<1.0	<1.0	14	<1.0	60	<1.0	7,200	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	44,000	<100	8,000	96,000	5.21	0.2 ±0.1	0.6 ±0.6	0.8 ±0.6
SB-1	4/25/2016	<1.0	<1.0	18	<1.0	100	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	1.0	<1.0	<1.0	58,000	<100	9,000	120,000	5.72	0.5 ±0.2	0.2 ±0.4	0.7 ±0.4
SB-1	6/6/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	55,000	<100	7,000	140,000	5.52	0.6 ±0.3	0.2 ±0.5	0.8 ±0.5
SB-1	7/18/2016	<1.0	<1.0	16	<1.0	70	<1.0	8,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	60,000	<100	9,000	120,000	5.35	0.4 ±0.3	0.0 ±0.6	0.4 ±0.6
SB-1	8/30/2016	<1.0	<1.0	17	<1.0	<50	<1.0	7,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	49,000	<100	7,000	120,000	5.23	0.4 ±0.3	0.3 ±0.4	0.7 ±0.4
SB-1	10/17/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	60,000	<100	6,000	130,000	5.63	0.6 ±0.4	0.0 ±0.4	0.6 ±0.4
SB-1	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	62,000	<100	6,000	88,000	5.63	1.0 ±0.4	0.8 ±0.5	1.8 ±0.5
SB-1	4/19/2017	<1.0	<1.0	16	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	56,000	<100	8,000	120,000	5.81	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
SB-1	11/17/2017					50		12,000									68,000	<100	8,000	120,000	5.70			
SB-1	1/31/2018 ¢							12,000																
SB-1	4/9/2018					67		12,000									55,000	<100	10,000	160,000	5.90			
SB-1	7/25/2018 ¢							12,000									63,000		13,000	140,000	5.94			
SB-1	11/29/2018					87		13,000									66,000	<100	10,000	100,000	6.07			
SB-1	4/26/2019					100		13,000									55,000	<100	12,000	140,000	5.78			
SB-1	11/15/2019					59		11,000									68,000	<100	10,000	140,000	5.56			
SB-1	4/23/2020					70		14,000									53,000	<100	11,000	150,000	5.94			
SB-1	11/12/2020					<50		10,000									64,000	<100	13,000	150,000	5.36			
SB-1	2/4/2021 ¢							11,000									78,000		11,000	150,000	5.12			
SB-1	4/28/2021					78		14,000									62,000	<100	11,000	180,000	5.42			
SB-1	9/14/2021					58		13,000									69,000	<100	11,000	210,000	6.21			
SB-1	11/15/2021					<50		14,000									93,000	<100	9,600	220,000	4.99			
SB-4	2/23/2016	<1.0	<1.0	14	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	95,000	<100	9,000	210,000	5.49	0.3 ±0.1	1.0 ±0.6	1.3 ±0.6
SB-4	4/25/2016	<1.0	<1.0	14	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	110,000	<100	8,000	200,000	5.32	0.3 ±0.3	0.0 ±0.4	0.3 ±0.4
SB-4	6/6/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	110,000	<100	10,000	230,000	5.62	0.2 ±0.2	0.4 ±0.5	0.6 ±0.5
SB-4	7/18/2016	<1.0	<1.0	11	<1.0	<50	<1.0	7,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	11,000	220,000	5.27	0.4 ±0.3	0.4 ±0.6	0.8 ±0.6
SB-4	8/30/2016	<1.0	<1.0	10	<1.0	<50	<1.0	6,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	88,000	<100	12,000	210,000	5.72	0.2 ±0.2	0.0 ±0.4	0.2 ±0.4
SB-4	10/17/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	10,000	190,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
SB-4	11/29/2016	<1.0	1.0	12	<1.0	<50	<1.0	7,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	10,000	180,000	5.79	0.7 ±0.3	0.5 ±0.5	1.2 ±0.5
SB-4	4/19/2017	<1.0	<1.0	19	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	120,000	<100	9,000	260,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
SB-4	11/17/2017					<50		10,000									77,000	<100	13,000	170,000	5.80			
SB-4	4/9/2018					<50		11,000									93,000	<100	12,000	220,000	5.87			
SB-4	7/25/2018 ¢							9,800									95,000		11,000	210,000	5.68			
SB-4	11/28/2018					<50		12,000									86,000	<100	13,000	83,000	6.28			
SB-4	4/26/2019					<50		13,000									94,000	<100	11,000	190,000	5.83			
SB-4	11/15/2019					53		11,000									97,000	<100	11,000	230,000	5.75			
SB-4	2/14/2020 ¢					<50		11,000									100,000		14,000	190,000	5.85			
SB-4	4/23/2020					55		13,000									140,000	<100	11,000	260,000	5.72			
SB-4	7/8/2020 ¢					57		11,000									99,000		14,000	240,000	5.59			
SB-4	11/12/2020					60		9,600									120,000	<100	18,000	260,000	5.18			
SB-4	2/4/2021 ¢					70		8,500									100,000		20,000	240,000	5.22			
SB-4	4/28/2021					65		11,000									100,000	<100	16,000	230,000	5.71			
SB-4	11/15/2021					<50		11,000									130,000	<100	12,000	290,000	5.16			
SB-6	2/23/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	80,000	<100	10,000	170,000	5.55	0.1 ±0.07	0.5 ±0.5	0.6 ±0.5
SB-6	4/25/2016	<1.0	<1.0	16	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	7,000	220,000	5.55	0.4 ±0.3	0.0 ±0.4	0.4 ±0.4
SB-6	6/6/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	8,000	270,000	5.40	0.5 ±0.3	0.0 ±0.5	0.5 ±0.5
SB-6	7/18/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	9,000	260,000	5.27	0.5 ±0.3	0.3 ±0.6	0.8 ±0.6
SB-6	8/30/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	9,000	280,000	5.71	0.4 ±0.2	0.0 ±0.4	0.4 ±0.4
SB-6	10/17/2016	<1.0	<1.0	18	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	260,000	5.78	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
SB-6	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	130,000	<100	9,000	230,000	5.77	0.5 ±0.2	0.8 ±0.5	1.3 ±0.5
SB-6	4/19/2017	<1.0	<1.0	13	<1.1	<51	<1.1	7,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	100,000	<100	9,000	190,000	5.68	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
SB-6	11/17/2017					<50		9,900									130,000	<100	11,000	230,000	5.60			
SB-6	4/9/2018					<50		7,900									120,000	<100	9,500	240,000	5.57			
SB-6	7/25/2018 ¢							11,000									180,000		12,000	310,000	5.44			
SB-6	11/28/2018					<50		11,000									150,000	<100	11,000	140,000	5.86			
SB-6	4/26/2019					84		13,000									150,000	<100	14,000	210,000	5.78			
SB-6	7/11/2019 ¢					80		14,000									170,000		15,000	330,000	5.84			
SB-6	11/15/2019					52		10,000									140,000	<100	13,000	280,000	5.75			
SB-6	2/14/2020 ¢					<50		5,100									79,000		15,000	130,000	5.73			
SB-6	4/23/2020					<50		12,000									160,000	<100	8,100	270,000	5.56			
SB-6	11/12/2020					<50		12,000									180,000	<100	9,600	330,000	5.37			
SB-6	4/28/2021					<50		11,000									150,000	<100	6,700	290,000	5.58			
SB-6	11/15/2021					<50		12,000									200,000	<100	8,800	370,000	5.27			
SB-13	2/23/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	160,000	<100	6,000	270,000	5.34	0.6 ±0.1	0.3 ±0.6	0.9±0.6
SB-13	4/25/2016	<1.0	<1.0	17	<1.0	<50	<1.0	8,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	160,000	<100	7,000	290,000	5.48	0.4 ±0.3	0.1 ±0.4	0.5 ±0.4
SB-13	6/6/2016	<1.0	<1.0	20	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	170,000	<100	7,000	320,000	5.50	0.8 ±0.3	0.0 ±0.5	0.8 ±0.5
SB-13	7/18/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	160,000	<100	8,000	330,000	5.27	0.8 ±0.3	0.0 ±0.6	0.8 ±0.6
SB-13	8/30/2016	<1.0	1.0	20	<1.0	<50	<1.0	8,100	2.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	270,000	5.35	0.8 ±0.3	0.6 ±0.4	1.4 ±0.4
SB-13	10/17/2016	<1.0	<1.0	15	<1.0	<50	<1.0	8,800	2.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	150,000	<100	8,000	260,000	5.06	0.7 ±0.4	0.6 ±0.5	1.3 ±0.5
SB-13	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	7,400	1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	140,000	<100	8,000	240,000	5.71	0.6 ±0.3	0.7 ±0.5	1.3 ±0.5
SB-13	4/19/2017	<1.0	<1.0	16	<1.1	<51	<1.1	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	130,000	<100	8,000	270,000	5.56	0.9 ±0.3	0.3 ±0.5	1.2 ±0.5
SB-13	11/17/2017					<50		7,000									110,000	<100	9,000	220,000	5.80			
SB-13	4/9/2018					<50		11,000									170,000	<100	8,000	330,000	5.81			
SB-13	7/25/2018 ¢							10,000									190,000		8,700	340,000	5.69			
SB-13	11/28/2018					<50		13,000									200,000	<100	7,200	260,000	5.77			
SB-13	4/26/2019					<50		14,000									200,000	<100	7,100	290,000	5.53			
SB-13	11/15/2019					<50		8,100									140,000	<100	8,100	280,000	5.82			
SB-13	4/23/2020					<50		14,000									230,000	<100	6,500	400,000	5.47			
SB-13	7/8/2020 ¢					<50		14,000									210,000		6,900	370,000	5.41			
SB-13	11/12/2020					<50		11,000									180,000	<100	8,000	330,000	4.96			
SB-13	2/4/2021 ¢					< 50		11,000									180,000		6,700	320,000	5.32			
SB-13	4/28/2021					<50		14,000									240,000	<100	5,900	410,000	5.31			
SB-13	11/15/2021					<50		11,000									200,000	<100	7,900	370,000	5.02			
SB-14	2/24/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,100	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0	<1.0	<1.0	16,000	<100	4,000	56,000	5.05	0.2 ±0.08	0.0 ±0.5	0.2 ±0.5
SB-14	4/25/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	11,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	58,000	<100	3,000	140,000	5.62	0.8 ±0.5	0.2 ±0.1	1.0 ±0.5
SB-14	6/6/2016	<1.0	<1.0	6.0	<1.0	<50	<1.0	7,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	32,000	<100	4,000	100,000	5.39	0.5 ±0.2	0.2 ±0.5	0.7 ±0.5
SB-14	7/18/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	21,000	<100	5,000	68,000	5.31	0.2 ±0.2	0.3 ±0.5	0.5 ±0.5
SB-14	8/30/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	14,000	<100	4,000	71,000	5.81	0.4 ±0.3	0.4 ±0.5	0.8 ±0.5
SB-14	10/17/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	4,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	11,000	<100	4,000	29,000	5.55	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
SB-14	11/29/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	2,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	7,000	<100	4,000	12,000	5.19	0.2 ±0.4	0.2 ±0.5	0.4 ±0.5
SB-14	4/19/2017	<1.0	<1.0	10	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0	<1.0	<1.0	56,000	<100	5,000	120,000	5.59	0.7 ±0.3	0.1 ±0.5	0.8 ±0.5
SB-14	11/17/2017					<50		8,000									18,000	<100	5,000	59,000	5.60			
SB-14	4/9/2018					<50		4,200									14,000	<100	8,400	80,000	5.76			
SB-14	7/25/2018 ¢							5,100									9,800		6,100	56,000	5.61			
SB-14	11/28/2018					<50		4,500									7,800	<100	6,300	<5,000	5.96			
SB-14	4/26/2019					<50		8,700									19,000	<100	3,700	91,000	5.74			
SB-14	11/15/2019					<50		5,000									12,000	<100	7,800	69,000	5.94			
SB-14	4/23/2020					<50		5,500									9,200	<100	5,500	52,000	5.63			
SB-14	11/12/2020					<50		4,000									4,700	<100	15,000	68,000	5.10			
SB-14	2/4/2021 ¢							7,900									34,000		6,000	95,000	5.30			
SB-14	4/28/2021					<50		3,300									4,000	<100	7,100	42,000	5.37			
SB-14	11/15/2021					<50		3,400									9,300	<100	16,000	64,000	5.55			

Notes:

1. Samples were collected by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire on the dates indicated and analyzed by EAI for select metals by USEPA Method 6020. Additional analysis for select wet chemistry parameters were completed by EAI. Analysis for radium 226 and 228 was completed by KNL Environmental Testing, Inc., of Tampa, Florida. Analysis for lithium was completed by SGS Accutest, of Marlborough, Massachussets (Feb. 2016) and Katahdin Analytical Services, of Scarborough, Maine (April 2016 through October 2016).

2. Concentrations are presented in micrograms per liter (µg/L), which are equivalent to parts per billion (ppb), or they are presented in picoCuries per liter (pCi/L) or pH standard units.

3. "<" indicates the analyte was not detected above the indicated laboratory reporting limit.
A blank indicates the sample was not analyzed for this parameter.

4. "GW-1" and "GW-2" 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 equivalent to the Ambient Groundwater Quality Standards (AGQSs) promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water. The GW-2 Groundwater Standards apply to groundwater as a potential source of indoor air contamination.

5. "Drinking Water MCLs" are from the United States Environmental Protection Agency (EPA) website (accessed March 22, 2016). The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are enforceable standards for drinking water systems.
"CCR Alt. Standards" were codified in 40 CFR Part 257.95(h)(2) for cobalt, lead, lithium, and molybdenum. These are alternative risk-based standards for the four constituents without MCLs that may require establishment of a groundwater protection standard under the coal combustion residuals (CCR) rules 40 CFR Part 257(h).

6. "*" indicates an MCL value is not currently available, and the listed value is an action level.
"†" indicates the RCMP lists the value as not currently available.
"‡" indicates the value provided is typically applied to field-filtered samples (i.e., dissolved analytes) for overburden monitoring wells.
"NA" indicates the RCMP lists the value as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the retesting program for identifying statistically significant increases (SSIs).

TABLE 2
Groundwater Level Measurements Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Date	Depths and elevations in feet.																
	SB-1			SB-4			SB-6			SB-13			SB-14			Inferred General Groundwater Flow Rate (feet/day)	Inferred General Groundwater Flow Direction
	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation		
Feb-16	240.85	33.82	207.03	274.26	67.36	206.90	268.77	61.84	206.93	219.86	11.83	208.03	242.70	34.88	207.82	0.5 - 2.7	Northeast
Apr-16	240.85	32.19	208.66	274.26	65.63	208.63	268.77	60.07	208.70	219.86	10.16	209.70	242.70	33.13	209.57	0.5 - 2.5	Northeast
Jun-16	240.85	31.84	209.01	274.26	66.24	208.02	268.77	60.80	207.97	219.86	11.11	208.75	242.70	33.93	208.77	0.4 - 1.9	East
Jul-16	240.85	33.88	206.97	274.26	67.30	206.96	268.77	62.07	206.70	219.86	12.41	207.45	242.70	35.10	207.60	0.4 - 1.9	Northeast
Aug-16	240.85	35.09	205.76	274.26	68.54	205.72	268.77	63.19	205.58	219.86	13.76	206.10	242.70	36.39	206.31	0.3 - 1.4	Northeast
Oct-16	240.85	36.20	204.65	274.26	69.68	204.58	268.77	64.42	204.35	219.86	13.92	205.94	242.70	37.58	205.12	0.8 - 3.9	North-Northeast
Nov-16	240.85	36.40	204.45	274.26	69.93	204.33	268.77	64.69	204.08	219.86	15.14	204.72	242.70	37.80	204.90	0.3 - 1.6	East-Northeast
Apr-17	240.85	32.27	208.58	274.26	65.82	208.44	268.77	60.04	208.73	219.86	9.58	210.28	242.70	32.99	209.71	0.8 - 3.8	North-Northeast
Nov-17	240.85	32.87	207.98	274.26	66.39	207.87	268.77	60.97	207.80	219.86	11.33	208.53	242.70	34.08	208.62	0.4 - 1.8	Northeast
Apr-18	240.85	31.13	209.72	274.26	64.58	209.68	268.77	58.93	209.84	219.86	8.74	211.12	242.70	31.94	210.76	0.6 - 3.2	North-Northeast
Jul-18	240.85	32.60	208.25	274.26	66.01	208.25	268.77	60.84	207.93	219.86	11.13	208.73	242.70	33.78	208.92	0.4 - 2.0	Northeast
Nov-18	240.85	29.99	210.86	274.26	63.59	210.67	268.77	57.92	210.85	219.86	7.66	212.20	242.70	30.82	211.88	0.7 - 3.3	Northeast
Apr-19	240.85	29.83	211.02	274.26	63.34	210.92	268.77	57.60	211.17	219.86	7.51	212.35	242.70	30.72	211.98	0.6 - 2.9	North-Northeast
Jul-19	–	–	–	–	–	–	268.77	58.71	210.06	–	–	–	–	–	–	–	–
Nov-19	240.85	34.48	206.37	274.26	67.96	206.30	268.77	62.66	206.11	219.86	13.21	206.65	242.70	35.85	206.85	0.3 - 1.3	East-Northeast
Feb-20	–	–	–	274.26	66.67	207.59	268.77	61.12	207.65	–	–	–	–	–	–	–	–
Apr-20	240.85	31.84	209.01	274.26	65.34	208.92	268.77	59.73	209.04	219.86	9.62	210.24	242.70	32.75	209.95	0.6 - 3.0	North-Northeast
Jul-20	–	–	–	274.26	66.00	208.26	–	–	–	219.86	11.00	208.86	–	–	–	–	–
Nov-20	240.85	35.72	205.13	274.26	69.23	205.03	268.77	63.92	204.85	219.86	14.48	205.38	242.70	37.09	205.61	0.3 - 1.3	East-Northeast
Feb-21	240.85	33.85	207.00	274.26	67.36	206.90	–	–	–	219.86	12.12	207.74	242.70	34.88	207.82	–	–
Apr-21	240.85	33.37	207.48	274.26	66.88	207.38	268.77	61.31	207.46	219.86	11.43	208.43	242.70	34.38	208.32	0.5 - 2.4	Northeast
Sep-21	240.85	31.11	209.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nov-21	240.85	31.65	209.20	274.26	65.17	209.09	268.77	59.72	209.05	219.86	10.04	209.82	242.70	32.78	209.92	0.4 - 1.9	Northeast

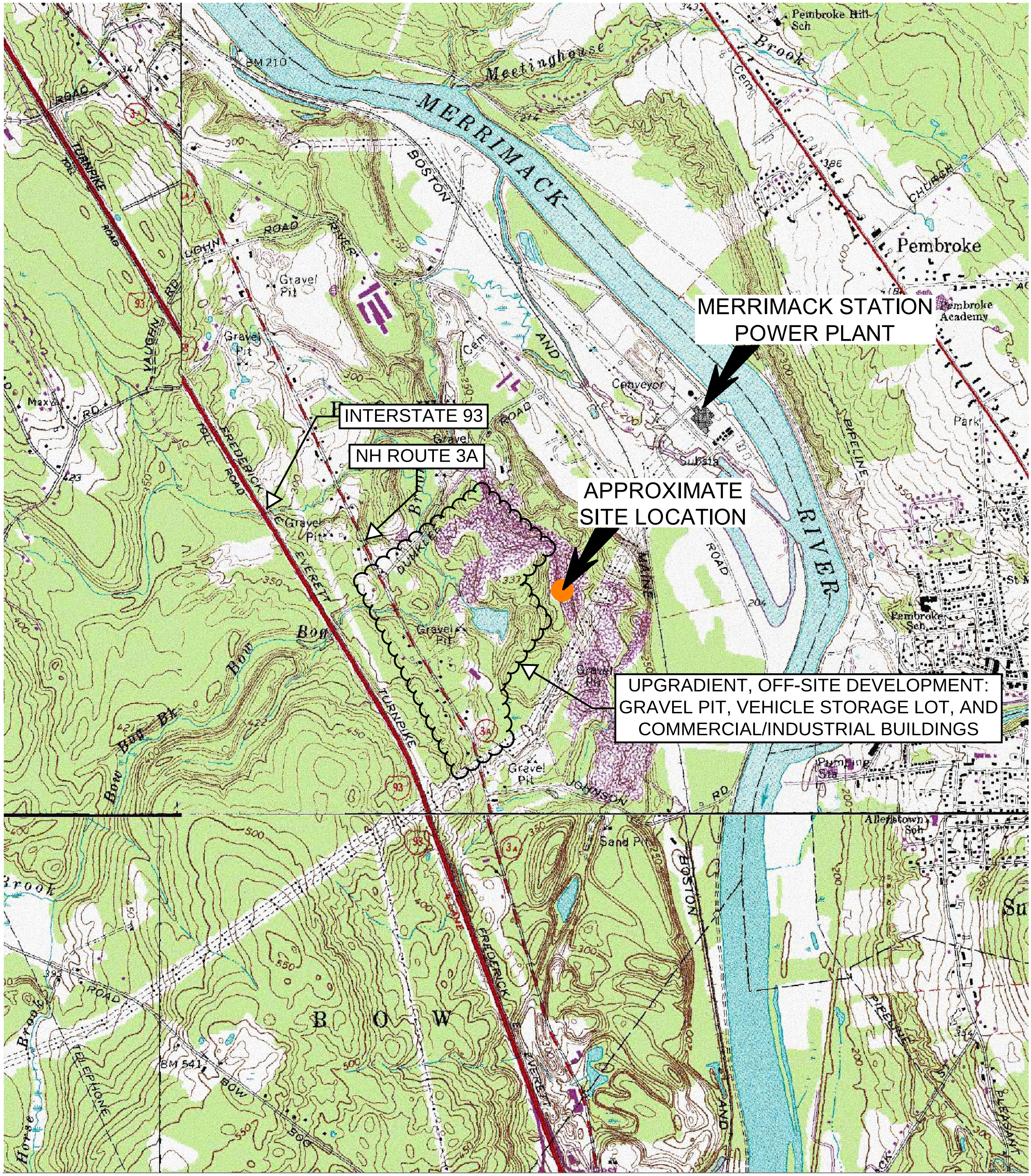
Notes:

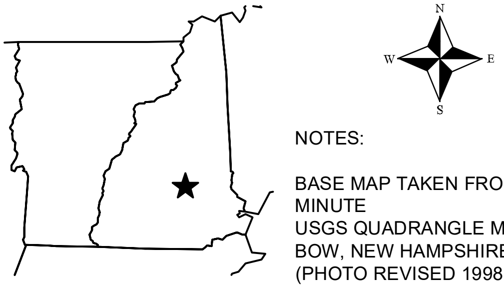
1. Depths to water were obtained from information provided in laboratory reports and field sampling sheets prepared by Eastern Analytical, Inc.

2. Inferred general groundwater flow rates and flow directions are approximate and are based on the limited hydrogeologic and groundwater elevation data available. Other interpretations are possible and actual conditions may vary from those indicated. Note that groundwater elevations, directions, and rates may change due to seasonal or other variations in temperature, precipitation, runoff, or other factors.

3. Approximate groundwater flow rates were calculated using an assumed saturated hydraulic conductivity of 100 to 500 feet per day, and an assumed porosity of 39%. Assumptions are consistent with values typical of medium-grained, clean sand. The calculated groundwater flow rate is equivalent to the average interstitial velocity or the seepage velocity.

FIGURES





NOTES:

BASE MAP TAKEN FROM 7.5 MINUTE USGS QUADRANGLE MAP: BOW, NEW HAMPSHIRE 1967 (PHOTO REVISED 1998)

Drawn By: E. Wright
Designed By: H. Roakes
Reviewed By: Steinhauser
Project No: 2025.13
Date: May 2022

1000 0 2000 Feet

SANBORN HEAD

Figure 1

Locus Plan

Alternative Source Demonstration
November 2021 Sampling

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

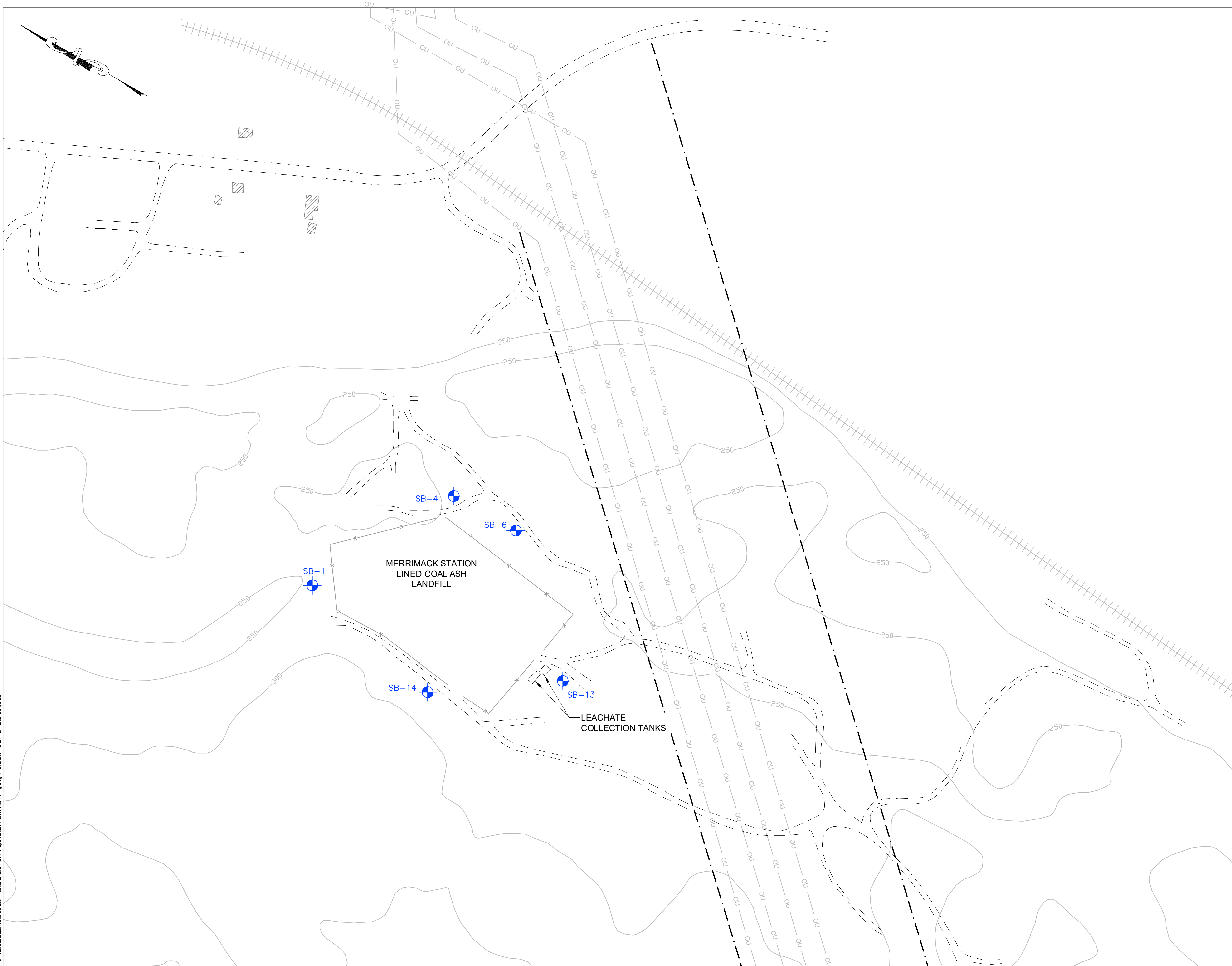


Figure 2

Facility Plan

Alternative Source Demonstration
November 2021 Sampling

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: E. Wright
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.13
Date: May 2022

Notes

1. The base map was developed from a drawing prepared by Public Service Company of New Hampshire's Engineering Division entitled, "Area Plan, Merrimack Station, Bow, N.H." The drawing was dated 5/1/90 and was last revised on 6/28/95.
2. The location of the landfill and the site features shown should be considered approximate.

Legend

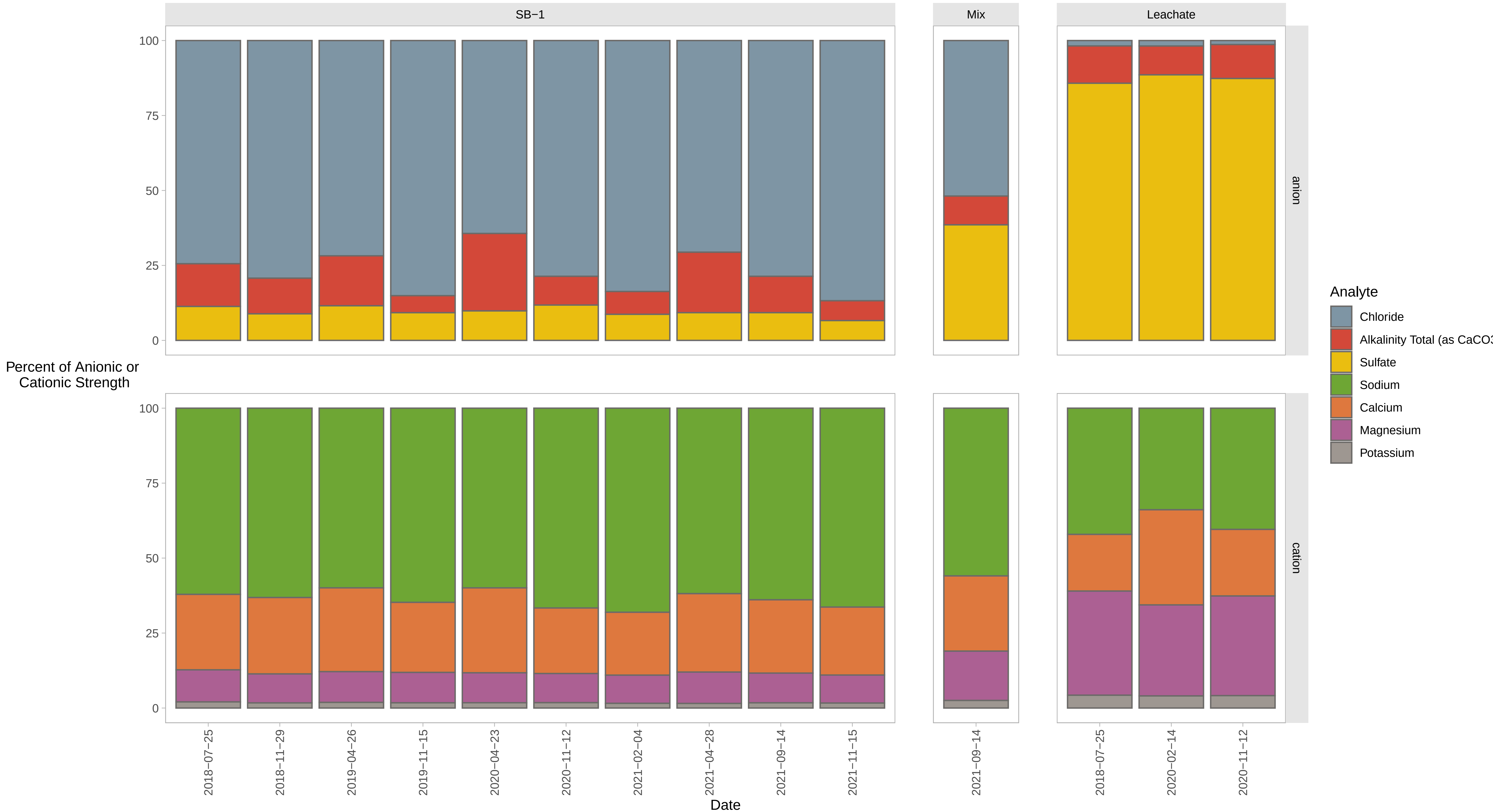
SB-4 Monitoring Well
Right-Of-Way
Fence
OU Overhead Utilities
250 Elevation Contour

150' 75' 0 150' 300' Feet

SANBORN HEAD

Figure 3 − SB−1 Major Ion Signature

Samples With Project−Specific Major Ion List Analyzed

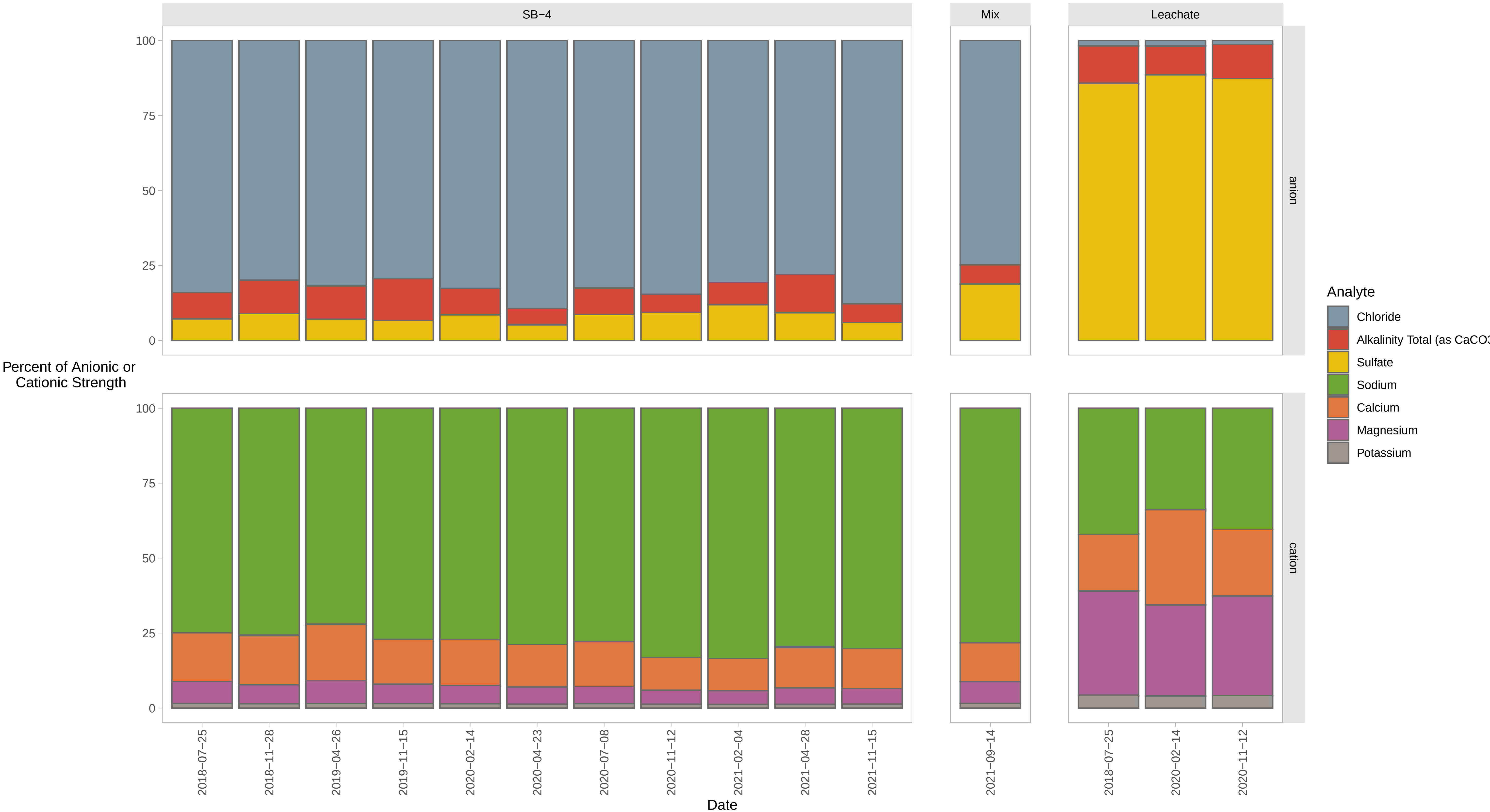


Notes:
Only samples with analysis of project−specific major ions are plotted.
The hypothetical mix sample is based on the well and leachate samples collected on November 12, 2020.
See text for additional assumptions and details.

Sanborn, Head & Associates, Inc. | P:/2000s/2025.13/Work/202204 ASD

Figure 4 − SB−4 Major Ion Signature

Samples With Project−Specific Major Ion List Analyzed

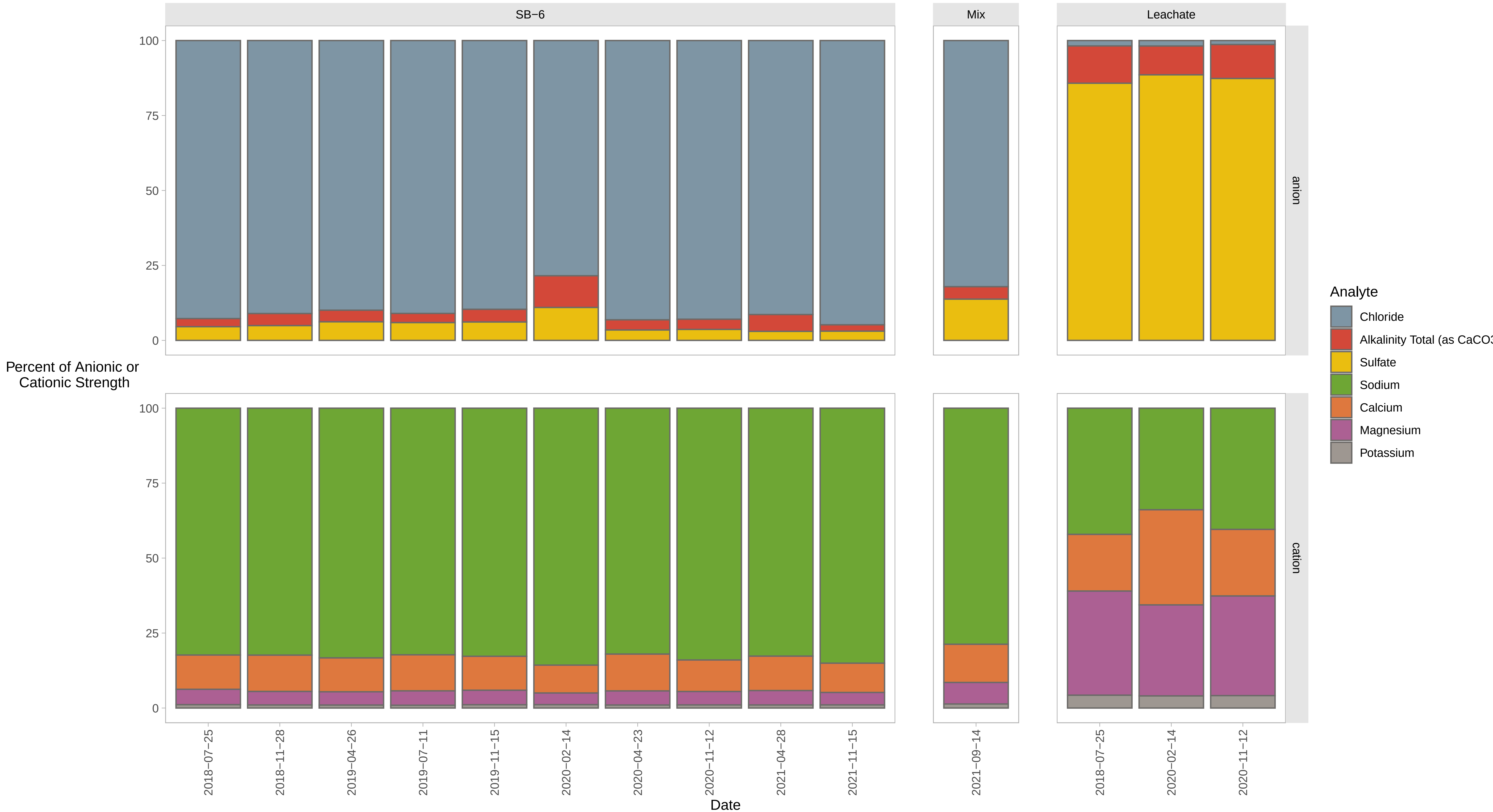


Notes:
Only samples with analysis of project−specific major ions are plotted.
The hypothetical mix sample is based on the well and leachate samples collected on November 12, 2020.
See text for additional assumptions and details.

Sanborn, Head & Associates, Inc. | P:/2000s/2025.13/Work/202204 ASD

Figure 5 − SB−6 Major Ion Signature

Samples With Project−Specific Major Ion List Analyzed



Notes:
Only samples with analysis of project−specific major ions are plotted.
The hypothetical mix sample is based on the well and leachate samples collected on November 12, 2020.
See text for additional assumptions and details.

Sanborn, Head & Associates, Inc. | P:/2000s/2025.13/Work/202204 ASD

ATTACHMENT A

ATTACHMENT A
QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I certify that the information in this alternative source demonstration (ASD) report, dated May 21, 2022 (the "Report"), is accurate, subject to the assumptions and limitations contained within the Report. The ASD report was prepared by Sanborn, Head & Associates, Inc. for the Merrimack Station Coal Ash Landfill site located in Bow, New Hampshire.

Harrison R. Roakes
Printed Name of Licensed Professional Engineer

Signature

15920	New Hampshire	5/31/2022
License Number	Licensing State	Date

ATTACHMENT B

ATTACHMENT B
LIMITATIONS

1. The conclusions and recommendations described in this report are based in part on the data obtained from a limited number of groundwater samples from widely-spaced monitoring locations. The monitoring locations indicate conditions only at the specific locations and times, and only to the depths sampled. They do not necessarily reflect variations that may exist between such locations, and the nature and extent of variations between these monitoring locations may not become evident until further study or remediation is initiated. The validity of the conclusions is based in part on assumptions Sanborn Head has made about conditions at the site. If conditions different from those described become evident, it will be necessary to re-evaluate the conclusions of this report.

2. Water level measurements were made in the monitoring well locations at times and under conditions stated within the report. Fluctuations in the levels of the groundwater may occur due to variations in precipitation and other factors not evident at the time measurements were made.

3. Quantitative laboratory analyses were performed as noted within the report. Additional analytes not searched for during the current study may be present in groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Additionally, variations in the types and concentrations of analytes and variations in their distributions within the groundwater may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.

4. The conclusions and recommendations contained in this report are based in part upon various types of chemical data as well as historical and hydrogeologic information developed during previous studies. While Sanborn Head reviewed the data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions, and recommendations presented herein should be modified accordingly.

5. This report was prepared for the exclusive use of GSP Merrimack LLC (GSP) for specific application for 40 CFR Part 257.90 compliance for GSP's Merrimack Station Coal Ash landfill in Bow, New Hampshire, and was prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

P:\2000s\2025.13\Source Files\202205 ASD\Att B - Limitations\Limitations.docx

Appendix C.3

November 2022
Alternative Source Demonstration

SANBORN HEAD

Mr. Allan G. Palmer
GSP Merrimack LLC
431 River Road
Bow, NH 03304

November 3, 2022
File No. 2025.13

Re: Alternative Source Demonstration – April 2022 Sampling
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Dear Allan:

Sanborn, Head & Associates, Inc. (Sanborn Head) prepared this Alternative Source Demonstration (ASD) for the Merrimack Station Coal Ash Landfill Site (the Site) located in Bow, New Hampshire. A qualified professional engineer certification is provided in Attachment A. This ASD was prepared in accordance with the Coal Combustion Residual (CCR) Rules (40 CFR Part 257) and is subject to the Limitations provided in Attachment B. A Locus Plan for the Site is provided as Figure 1

INTRODUCTION

Based on the prediction interval procedure performed by Sanborn Head, statistically significant increases (SSIs) compared to background groundwater concentrations were identified for calcium, chloride, and total dissolved solids (TDS) at monitoring well SB-1.[1] As such, pursuant to 40 CFR Part 257.94(e)(2), within 90 days of detecting the SSI, the owner or operator may provide a written demonstration from a qualified professional engineer that: (i) a source other than the CCR unit caused the SSI; or (ii) the SSI resulted from either an error in sampling, analysis, or statistical evaluation; or natural variation in groundwater chemistry.

Groundwater analytical data are provided in Table 1, and groundwater elevation data are provided in Table 2. The locations of the monitoring wells in relation to the landfill are indicated on the Facility Plan, Figure 2.

BACKGROUND

The calcium, chloride, and TDS SSIs are based on a sample collected from SB-1 in April 2022. Using a weight-of-evidence approach, we conclude that the SSIs are not sourced from the CCR unit based on the following findings:

- Calcium, chloride, and TDS concentrations are similar to or less than calcium, chloride, and TDS concentrations detected at the Site upgradient monitoring well.
- Calcium, chloride, and TDS concentrations are within the range of naturally occurring concentrations.

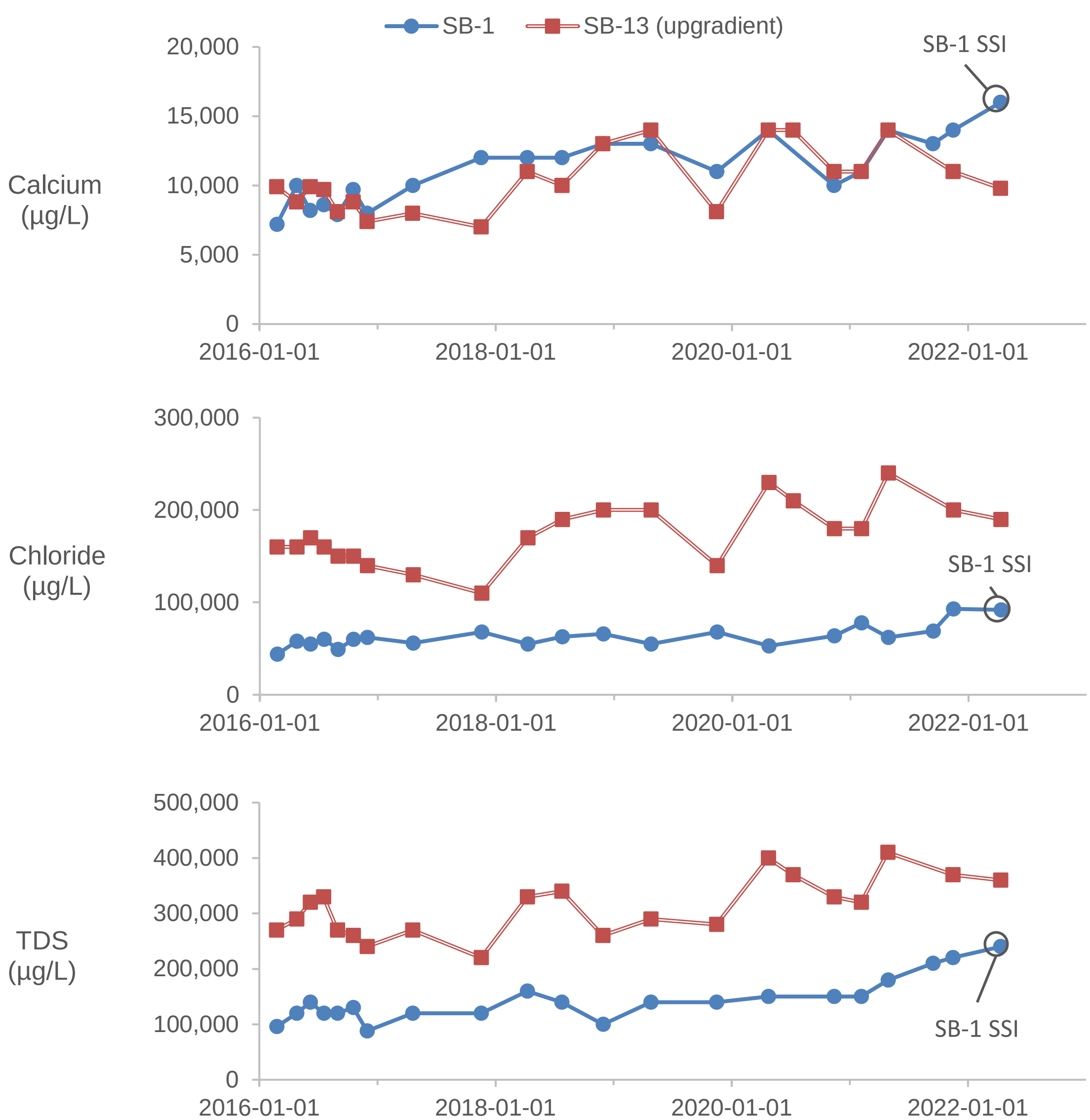
[1] The April 2022 laboratory analytical data were received on April 29, 2022. Confirmatory sampling, which may be used with the “1-of-2” retesting strategy, was elected to not be completed, and the SSIs were assumed on August 5, 2022.

- If the SSIs were from CCR impacts to groundwater, then the TDS SSI should be caused by increases in calcium, chloride, and other Appendix III analytes, such as sulfate and boron. Because other Appendix III analytes, except chloride, do not contribute substantially to the TDS SSI, the TDS SSI is not consistent with CCR impacts to groundwater at SB-1.
- A comparison of major ion signatures indicates the calcium, chloride, and TDS SSIs are not sourced from CCR impacts to groundwater at SB-1.

SITE UPGRADIENT CONCENTRATIONS

Time series plots of calcium, chloride, and TDS concentrations for SB-1 and upgradient SB-13 are provided below as Exhibit 1. The SB-1 SSI concentrations are similar to or less than historical calcium, chloride, and TDS concentrations at the Site upgradient monitoring well SB-13.

Exhibit 1: SB-1 Calcium, Chloride, and TDS Concentrations Compared to Site Upgradient Concentrations



The April 2022 calcium, chloride, and TDS SSIs were identified as SSIs because they were higher concentrations than previously detected at SB-1. However, the calcium, chloride, and TDS SSI concentrations are well within the range of concentrations that could be expected to occur at the Site, given similar or higher calcium, chloride, and TDS concentrations observed at the upgradient monitoring well SB-13.

NATURALLY OCCURRING AND AMBIENT CONCENTRATIONS

Calcium, chloride, and TDS occur naturally in groundwater in the region through rain, atmospheric deposition, and dissolution of ion-producing minerals in rock and soil. Human activities, such as road salting, agriculture, and subsurface wastewater discharge, also contribute to calcium, chloride, and TDS concentrations in groundwater.

Sodium and chloride, the typical constituents of road salt, are the predominant ions in groundwater that comprise TDS for most wells at the Site, including SB-1 and upgradient SB-13. Road salt may contribute to variation (seasonally and with precipitation) in chloride and TDS concentrations at the Site because two major roadways, New Hampshire Route 3A and Interstate 93, are to the west and southwest (upgradient) of the Site. There is also off-site development upgradient of the Site, including a gravel pit, vehicle storage lots, roadways, and commercial/industrial buildings, which are likely to store or use road salt. These off-site features are indicated on Figure 1.

Additionally, the use of calcium chloride for dust control on gravel roads around the Site was permitted by the New Hampshire Department of Environmental Services in 2001.[2] The period and extent of calcium chloride use at or around the Site is uncertain. Sodium chloride salt also may have been applied or may have been carried onto gravel roads via truck traffic around the Site through years of sand and gravel mining and landfill operations.

The calcium, chloride, and TDS SSI concentrations are within the range of naturally occurring or ambient concentrations for comparable groundwaters, as reported in local aquifer, state-wide, and regional studies summarized in Exhibit 2 below.[3,4,5] The local aquifer and state-wide USGS studies are specific to stratified drift aquifers with similar geology to the Site, and the regional study is applicable to the Site because the glacial outwash overburden at the Site is eroded from the underlying crystalline rock and has similar mineralogical composition to the aquifers in the regional USGS study. The calcium, chloride, and TDS SSI concentrations at SB-1 were mostly greater than the maximum values detected in the small local study, but they were well within the range of calcium, chloride, and TDS concentrations reported in the state and regional studies.

---

2 North American Reserve. May 11, 2001. *Notification to Apply Calcium Chloride as Dust Control Agent*; and New Hampshire Department of Environmental Services. May 14, 2001. *Bow – PSNH Pit, Manchester Sand & Gravel, Johnson Road, Nondomestic Discharge Registration (DES# 198400065)*.

3 U.S. Geological Survey. 1997. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Upper Merrimack River Basin, South-Central New Hampshire*; and U.S. Geological Survey. 1995. *Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire*.

4 U.S. Geological Survey. 1995. *Ground-Water Resources in New Hampshire: Stratified-Drift Aquifers*.

5 U.S. Department of the Interior and U.S. Geological Survey. 2012. *Quality of Water from Crystalline Rock Aquifers in New England, New Jersey, and New York, 1995-2007*.

Exhibit 2: Comparison of Site Calcium, Chloride, and TDS Concentrations and Literature Values

Study/Location	Calcium (µg/L)		Chloride (µg/L)		TDS (µg/L)	
SB-1 (SSI data in **bold**)	April 2022:	**16,000**	April 2022:	**92,000**	April 2022:	**240,000**
USEPA Secondary Maximum Contaminant Level (SMCL)	SMCL:	None	SMCL:	250,000	SMCL:	500,000
Site Upgradient SB-13 Data February 2016 through April 2022 [sample size (n)=21]	Min: Median: Max:	7,000 9,900 14,000	Min: Median: Max:	110,000 170,000 240,000	Min: Median: Max:	220,000 320,000 410,000
Local Stratified Drift Aquifers [n=16]	Minimum: Median: Maximum:	3,400 4,650 8,600	Minimum: Median: Maximum:	1,500 7,450 120,000	Minimum: Median: Maximum:	33,000 54,000 216,000
New Hampshire Stratified Drift Aquifers [n=256 for calcium and chloride, n=252 for TDS]	Minimum: Median: Maximum:	40 7,600 87,000	Minimum: Median: Maximum:	300 10,000 300,000	Minimum: Median: Maximum:	17,000 77,000 612,000
Northeast Crystalline Rock Aquifers [n=117 for calcium and TDS, n=1,867 for chloride]	Minimum: Median: 90^{th} percentile: Maximum:	2,700 19,800 53,400 98,500	Minimum: Median: 90^{th} percentile: Maximum:	<2,500 17,000 117,000 1,800,000	Minimum: Median: 90^{th} percentile: Maximum:	29,000 126,000 323,000 876,000

See text and footnotes for references.

The SB-1 SSI concentrations were lower than the U.S. Environmental Protection Agency (USEPA) Secondary Maximum Contaminant Level (SMCL) for chloride (250,000 µg/L) and TDS (500,000 µg/L). The USEPA SMCL for chloride and TDS are based on aesthetic and corrosion considerations for public water systems, so it is not applicable to groundwater in this situation but may be used as a reference concentration. Calcium does not have a USEPA SMCL except that it contributes to TDS. Neither calcium, chloride, nor TDS have ambient groundwater quality standards in New Hampshire, but like the USEPA values, there is a New Hampshire SMCL of 500,000 µg/L for TDS and 250,000 µg/L for chloride in public water systems.

OTHER INDICATOR ANALYTES

The CCR Rules for detection monitoring require analysis of boron, calcium, chloride, fluoride, pH, sulfate, and TDS (i.e., the Appendix III indicator analytes). If the SSIs were from CCR impacts to groundwater, then the TDS SSI should be caused by increases in calcium, chloride, and other Appendix III analytes, such as sulfate and boron. Because other Appendix III analytes, except chloride, do not contribute substantially to the TDS SSI, the TDS SSI is not consistent with CCR impacts to groundwater at SB-1.

TDS is a relatively general, non-targeted analysis that measures the amounts of inorganic salts and small amounts of dissolved organic matter present in the sample. TDS is a collective measure that includes the dissolved Appendix III indicator analytes boron, calcium, chloride, fluoride, and sulfate, as well as other dissolved constituents (e.g., sodium, alkalinity, magnesium, potassium, and silica). The laboratory method for TDS includes filtering the sample and evaporating the water so that residual solids from the sample can be measured; laboratory TDS measurements do not distinguish between individual analytes or constituents.

As discussed above and with respect to naturally occurring and ambient concentrations, chloride concentrations in groundwater may be affected by a variety of human activities. Activities such as road salting and subsurface wastewater discharge may include the use of chloride-containing salts, so those impact signatures can have strong chloride signatures. In contrast, chloride concentrations in Site leachate typically contribute about 10 percent or less of TDS.[6] With such a weak chloride signature in leachate, increases in TDS associated with chloride are not an indicator of Site impacts.

An analysis of chloride contributions to the TDS SSI, shown in Exhibit 3, indicates that chloride constituted about 31 percent of the April 2022 TDS at SB-1. Calcium and sulfate, which are other major ion Appendix III indicator analytes, contributed to only 6 percent of the TDS increase. The remaining change in TDS is largely from parameters not included in CCR Appendix III detection monitoring analytes, such as magnesium, sodium, and alkalinity. These observations implicate chloride as a primary underlying source of the April 2022 TDS SSIs.

Exhibit 3: Analysis of Appendix III Analyte Contributions to TDS SSI at SB-1

SB-1 November 2020 Background Concentrations (µg/L)	Calcium	10,000
	Sulfate	13,000
	Boron	<50
	Fluoride	<100
	Chloride	64,000
	TDS	150,000
SB-1 April 2022 Concentrations (µg/L)	Calcium	16,000
	Sulfate	12,000
	Boron	81
	Fluoride	<100
	Chloride	92,000
	TDS	240,000
SB-1 Concentration Change (µg/L)	Calcium	+6,000
	Sulfate	-1,000
	Boron	~31
	Fluoride	~0
	Chloride	+28,000
	TDS	+90,000
SB-1 Percent of TDS Change	**Calcium**	**+7%**
	Sulfate	**-1%**
	Boron	**~+0.03%**
	Fluoride	**~0%**
	Chloride	**+31%**

The November 2020 sampling event was selected for background comparison because it is a recent sampling event with neither chloride nor TDS SSIs.
"Percent of TDS Change" is calculated by dividing the change in analyte by the change in TDS.

[6] For three of four leachate samples with major ions analyzed, chloride concentrations ranged from about 35 to 76 mg/L, TDS concentrations ranged from about 3,300 to 7,900 mg/L, and chloride contributed about 0.9 to 1.1 percent of TDS. The fourth sample had 390 mg/L chloride, 3,700 mg/L TDS, and chloride as 11 percent of TDS.

Because the TDS SSI is not caused by Appendix III analytes, except chloride, the SSI is not consistent with CCR impacts to groundwater.

COMPARISON OF MAJOR ION SIGNATURES

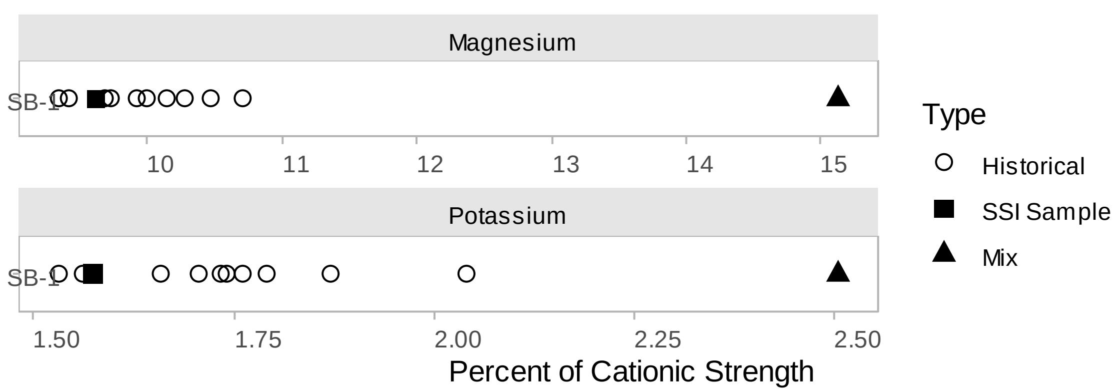
Major ion chemistry was analyzed for samples since July 2018. Leachate from the Site was also analyzed for major ion chemistry for four samples. These data are presented as plotted values in Figure 3. The major ion chemistry data show that SB-1 samples are consistently sodium-chloride water types, including the April 2022 samples that had calcium, chloride, and TDS SSIs. The leachate is characterized as a [sodium-calcium-magnesium]–sulfate water type.

A calculated, hypothetical mix of background (pre-SSI) samples and a leachate sample are also shown in Figure 3. The major ion chemistry for the “mix” samples is based on the November 2020 background sample, which has relatively low TDS, and the April 2022 leachate sample, which has relatively high TDS. The ratio of background sample to leachate sample was adjusted so that the TDS concentration of the “mix" sample is equal to the TDS concentration for the April 2022 TDS SSI sample. The “mix” sample represents a hypothetical SSI groundwater sample if the TDS SSI was caused by leachate impacts.

Sulfate is the predominant major anion in leachate and is not a predominant major anion in Site groundwater, so the hypothetical mix sample shows increased sulfate levels over the background groundwater samples. Because sulfate levels at SB-1, including April 2022 SSI sample, are consistently low and are not similar to the sulfate levels in the hypothetical mix sample, these data indicate the calcium, chloride, and TDS SSIs are not sourced from CCR impacts to groundwater.

For cationic signatures, the leachate has more magnesium and potassium than Site groundwater. The magnesium and the potassium levels for historical data, the April 2022 SSI data, and the hypothetical mix sample are shown in Exhibit 4. The SSI data is consistent with historical data and has overall lower magnesium and potassium levels. This pattern in the SSI data is not consistent with the mix sample, which show higher magnesium and potassium.

Exhibit 4: Magnesium and Potassium Signatures



Based on the contrasting ionic signatures between the hypothetical mix samples and the April 2022 SSI sample, the mixing model results are not indicative of impacts from leachate.

CLOSING

Based on our understanding of the information presented herein, including the Site characteristics, natural variation of regional groundwater chemistry, and the groundwater flow and groundwater chemistry monitoring data, the April 2022 calcium, chloride, and TDS SSIs are not sourced from the CCR unit.

Thank you for the opportunity to be of service to GSP Merrimack LLC. We look forward to continuing to work with you on this project.

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

Harrison R. Roakes, PE
Project Manager

Eric S. Steinhauser, PE, CPESC, CPSWQ
Senior Vice President and Principal

HRR/ESS: hrr

Encl. Table 1 – Groundwater Analytical Results Summary
Table 2 – Groundwater Level Measurements Summary

Figure 1 – Locus Plan
Figure 2 – Facility Plan
Figure 3 – SB-1 Major Ion Signature

Attachment A – Qualified Professional Engineer Certification
Attachment B – Limitations

P:\2000s\2025.13\Source Files\202211 ASD\202211 ASD.docx

Tables

TABLE 1
Groundwater Analytical Results Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Silica	Selenium	Thallium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Radium 226	Radium 228	Radium 226+228
		Metals																Miscellaneous Parameters							
		µg/L																				s.u	pCi/L		
	Drinking Water MCL	6	5	2,000	4	NS	5	NS	100	NS	15*	NS	2	NS	NS	50	2	NS	4,000	NS	NS	NS	NS	NS	5
	CCR Alt. Standards	NA	NA	NA	NA	NA	NA	NA	NA	6	15	40	NA	100		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GW-1/(AGQS)	6 ‡	5 ‡	2,000 ‡	4 ‡	6,000 ‡	5 ‡	NS ‡	100	NS ‡	15 ‡	NS	2 ‡	NS	NS	50 ‡	2 ‡	NS	4,000	500,000	NS	NS	NS	NS	NS
	GW-2	NA	NA	NA	NA	NA	NA	NS	NA	NS	NA	NS	NA	NS	NS	NA	NA	NS	†	†	NS	NS	NS	NS	NS
SB-1	2/24/2016	<1.0	<1.0	14	<1.0	60	<1.0	7,200	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	44,000	<100	8,000	96,000	5.21	0.2 ±0.1	0.6 ±0.6	0.8 ±0.6
SB-1	4/25/2016	<1.0	<1.0	18	<1.0	100	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	1.0		<1.0	<1.0	58,000	<100	9,000	120,000	5.72	0.5 ±0.2	0.2 ±0.4	0.7 ±0.4
SB-1	6/6/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	55,000	<100	7,000	140,000	5.52	0.6 ±0.3	0.2 ±0.5	0.8 ±0.5
SB-1	7/18/2016	<1.0	<1.0	16	<1.0	70	<1.0	8,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	60,000	<100	9,000	120,000	5.35	0.4 ±0.3	0.0 ±0.6	0.4 ±0.6
SB-1	8/30/2016	<1.0	<1.0	17	<1.0	<50	<1.0	7,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	49,000	<100	7,000	120,000	5.23	0.4 ±0.3	0.3 ±0.4	0.7 ±0.4
SB-1	10/17/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	60,000	<100	6,000	130,000	5.63	0.6 ±0.4	0.0 ±0.4	0.6 ±0.4
SB-1	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	62,000	<100	6,000	88,000	5.63	1.0 ±0.4	0.8 ±0.5	1.8 ±0.5
SB-1	4/19/2017	<1.0	<1.0	16	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	56,000	<100	8,000	120,000	5.81	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
SB-1	11/17/2017					50		12,000										68,000	<100	8,000	120,000	5.70			
SB-1	1/31/2018 ¢							12,000																	
SB-1	4/9/2018					67		12,000										55,000	<100	10,000	160,000	5.90			
SB-1	7/25/2018 ¢							12,000										63,000		13,000	140,000	5.94			
SB-1	11/29/2018					87		13,000										66,000	<100	10,000	100,000	6.07			
SB-1	4/26/2019					100		13,000										55,000	<100	12,000	140,000	5.78			
SB-1	11/15/2019					59		11,000										68,000	<100	10,000	140,000	5.56			
SB-1	4/23/2020					70		14,000										53,000	<100	11,000	150,000	5.94			
SB-1	11/12/2020					<50		10,000										64,000	<100	13,000	150,000	5.36			
SB-1	2/4/2021 ¢							11,000										78,000		11,000	150,000	5.12			
SB-1	4/28/2021					78		14,000										62,000	<100	11,000	180,000	5.42			
SB-1	9/14/2021 ¢					58		13,000							14,000			69,000	<100	11,000	210,000	6.21			
SB-1	11/15/2021					<50		14,000							13,000			93,000	<100	9,600	220,000	4.99			
SB-1	4/11/2022					81		16,000										92,000	<100	12,000	240,000	5.75			
SB-4	2/23/2016	<1.0	<1.0	14	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	95,000	<100	9,000	210,000	5.49	0.3 ±0.1	1.0 ±0.6	1.3 ±0.6
SB-4	4/25/2016	<1.0	<1.0	14	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	110,000	<100	8,000	200,000	5.32	0.3 ±0.3	0.0 ±0.4	0.3 ±0.4
SB-4	6/6/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	110,000	<100	10,000	230,000	5.62	0.2 ±0.2	0.4 ±0.5	0.6 ±0.5
SB-4	7/18/2016	<1.0	<1.0	11	<1.0	<50	<1.0	7,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	11,000	220,000	5.27	0.4 ±0.3	0.4 ±0.6	0.8 ±0.6
SB-4	8/30/2016	<1.0	<1.0	10	<1.0	<50	<1.0	6,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	88,000	<100	12,000	210,000	5.72	0.2 ±0.2	0.0 ±0.4	0.2 ±0.4
SB-4	10/17/2016	<1.0	<1.0	12	<1.0	<50	<1.0	8,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	10,000	190,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
SB-4	11/29/2016	<1.0	1.0	12	<1.0	<50	<1.0	7,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	10,000	180,000	5.79	0.7 ±0.3	0.5 ±0.5	1.2 ±0.5
SB-4	4/19/2017	<1.0	<1.0	19	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	120,000	<100	9,000	260,000	5.71	0.3 ±0.3	0.0 ±0.5	0.3 ±0.5
SB-4	11/17/2017					<50		10,000										77,000	<100	13,000	170,000	5.80			
SB-4	4/9/2018					<50		11,000										93,000	<100	12,000	220,000	5.87			
SB-4	7/25/2018 ¢							9,800										95,000		11,000	210,000	5.68			
SB-4	11/28/2018					<50		12,000										86,000	<100	13,000	83,000	6.28			
SB-4	4/26/2019					<50		13,000										94,000	<100	11,000	190,000	5.83			
SB-4	11/15/2019					53		11,000										97,000	<100	11,000	230,000	5.75			
SB-4	2/14/2020 ¢					<50		11,000										100,000		14,000	190,000	5.85			
SB-4	4/23/2020					55		13,000										140,000	<100	11,000	260,000	5.72			
SB-4	7/8/2020 ¢					57		11,000										99,000		14,000	240,000	5.59			
SB-4	11/12/2020					60		9,600										120,000	<100	18,000	260,000	5.18			
SB-4	2/4/2021 ¢					70		8,500										100,000		20,000	240,000	5.22			
SB-4	4/28/2021					65		11,000										100,000	<100	16,000	230,000	5.71			
SB-4	11/15/2021					<50		11,000							12,000			130,000	<100	12,000	290,000	5.16			
SB-4	4/11/2022					55		13,000										110,000	<100	20,000	250,000	5.68			
SB-6	2/23/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	80,000	<100	10,000	170,000	5.55	0.1 ±0.07	0.5 ±0.5	0.6 ±0.5
SB-6	4/25/2016	<1.0	<1.0	16	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	7,000	220,000	5.55	0.4 ±0.3	0.0 ±0.4	0.4 ±0.4
SB-6	6/6/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	8,000	270,000	5.40	0.5 ±0.3	0.0 ±0.5	0.5 ±0.5
SB-6	7/18/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,200	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	9,000	260,000	5.27	0.5 ±0.3	0.3 ±0.6	0.8 ±0.6
SB-6	8/30/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	9,000	280,000	5.71	0.4 ±0.2	0.0 ±0.4	0.4 ±0.4
SB-6	10/17/2016	<1.0	<1.0	18	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	260,000	5.78	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
SB-6	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	8,100	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	130,000	<100	9,000	230,000	5.77	0.5 ±0.2	0.8 ±0.5	1.3 ±0.5
SB-6	4/19/2017	<1.0	<1.0	13	<1.1	<51	<1.1	7,400	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	100,000	<100	9,000	190,000	5.68	0.4 ±0.3	0.2 ±0.5	0.6 ±0.5
SB-6	11/17/2017					<50		9,900										130,000	<100	11,000	230,000	5.60			
SB-6	4/9/2018					<50		7,900										120,000	<100	9,500	240,000	5.57			
SB-6	7/25/2018 ¢							11,000										180,000		12,000	310,000	5.44			
SB-6	11/28/2018					<50		11,000										150,000	<100	11,000	140,000	5.86			
SB-6	4/26/2019					84		13,000										150,000	<100	14,000	210,000	5.78			
SB-6	7/11/2019 ¢					80		14,000										170,000		15,000	330,000	5.84			
SB-6	11/15/2019					52		10,000										140,000	<100	13,000	280,000	5.75			
SB-6	2/14/2020 ¢					<50		5,100										79,000		15,000	130,000	5.73			
SB-6	4/23/2020					<50		12,000										160,000	<100	8,100	270,000	5.56			
SB-6	11/12/2020					<50		12,000										180,000	<100	9,600	330,000	5.37			
SB-6	4/28/2021					<50		11,000										150,000	<100	6,700	290,000	5.58			
SB-6	11/15/2021					<50		12,000							12,000			200,000	<100	8,800	370,000	5.27			
SB-6	4/11/2022					<50		10,000										170,000	<100	9,400	330,000	5.80			
SB-13	2/23/2016	<1.0	<1.0	17	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	160,000	<100	6,000	270,000	5.34	0.6 ±0.1	0.3 ±0.6	0.9±0.6
SB-13	4/25/2016	<1.0	<1.0	17	<1.0	<50	<1.0	8,800	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	160,000	<100	7,000	290,000	5.48	0.4 ±0.3	0.1 ±0.4	0.5 ±0.4
SB-13	6/6/2016	<1.0	<1.0	20	<1.0	<50	<1.0	9,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	170,000	<100	7,000	320,000	5.50	0.8 ±0.3	0.0 ±0.5	0.8 ±0.5
SB-13	7/18/2016	<1.0	<1.0	18	<1.0	<50	<1.0	9,700	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	160,000	<100	8,000	330,000	5.27	0.8 ±0.3	0.0 ±0.6	0.8 ±0.6
SB-13	8/30/2016	<1.0	1.0	20	<1.0	<50	<1.0	8,100	2.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	270,000	5.35	0.8 ±0.3	0.6 ±0.4	1.4 ±0.4
SB-13	10/17/2016	<1.0	<1.0	15	<1.0	<50	<1.0	8,800	2.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	150,000	<100	8,000	260,000	5.06	0.7 ±0.4	0.6 ±0.5	1.3 ±0.5
SB-13	11/29/2016	<1.0	<1.0	16	<1.0	<50	<1.0	7,400	1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	140,000	<100	8,000	240,000	5.71	0.6 ±0.3	0.7 ±0.5	1.3 ±0.5
SB-13	4/19/2017	<1.0	<1.0	16	<1.1	<51	<1.1	8,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	130,000	<100	8,000	270,000	5.56	0.9 ±0.3	0.3 ±0.5	1.2 ±0.5
SB-13	11/17/2017					<50		7,000										110,000	<100	9,000	220,000	5.80			
SB-13	4/9/2018					<50		11,000										170,000	<100	8,000	330,000	5.81			
SB-13	7/25/2018 ¢							10,000										190,000		8,700	340,000	5.69			
SB-13	11/28/2018					<50		13,000										200,000	<100	7,200	260,000	5.77			
SB-13	4/26/2019					<50		14,000										200,000	<100	7,100	290,000	5.53			
SB-13	11/15/2019					<50		8,100										140,000	<100	8,100	280,000	5.82			
SB-13	4/23/2020					<50		14,000										230,000	<100	6,500	400,000	5.47			
SB-13	7/8/2020 ¢					<50		14,000										210,000		6,900	370,000	5.41			
SB-13	11/12/2020					<50		11,000										180,000	<100	8,000	330,000	4.96			
SB-13	2/4/2021 ¢					< 50		11,000										180,000		6,700	320,000	5.32			
SB-13	4/28/2021					<50		14,000										240,000	<100	5,900	410,000	5.31			
SB-13	11/15/2021					<50		11,000							12,000			200,000	<100	7,900	370,000	5.02			
SB-13	4/11/2022					<50		9,800										190,000	<100	9,700	360,000	5.47			
SB-14	2/24/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,100	<1.0	<1.0	<1.0	<1,000	<0.10	<1.0		<1.0	<1.0	16,000	<100	4,000	56,000	5.05	0.2 ±0.08	0.0 ±0.5	0.2 ±0.5
SB-14	4/25/2016	<1.0	<1.0	9.0	<1.0	<50	<1.0	11,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	58,000	<100	3,000	140,000	5.62	0.8 ±0.5	0.2 ±0.1	1.0 ±0.5
SB-14	6/6/2016	<1.0	<1.0	6.0	<1.0	<50	<1.0	7,600	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	32,000	<100	4,000	100,000	5.39	0.5 ±0.2	0.2 ±0.5	0.7 ±0.5
SB-14	7/18/2016	<1.0	<1.0	3.0	<1.0	<50	<1.0	6,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	21,000	<100	5,000	68,000	5.31	0.2 ±0.2	0.3 ±0.5	0.5 ±0.5
SB-14	8/30/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	5,300	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	14,000	<100	4,000	71,000	5.81	0.4 ±0.3	0.4 ±0.5	0.8 ±0.5
SB-14	10/17/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	4,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	11,000	<100	4,000	29,000	5.55	0.2 ±0.3	0.0 ±0.5	0.2 ±0.5
SB-14	11/29/2016	<1.0	<1.0	2.0	<1.0	<50	<1.0	2,900	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	7,000	<100	4,000	12,000	5.19	0.2 ±0.4	0.2 ±0.5	0.4 ±0.5
SB-14	4/19/2017	<1.0	<1.0	10	<1.0	<50	<1.0	10,000	<1.0	<1.0	<1.0	<100	<0.10	<1.0		<1.0	<1.0	56,000	<100	5,000	120,000	5.59	0.7 ±0.3	0.1 ±0.5	0.8 ±0.5
SB-14	11/17/2017					<50		8,000										18,000	<100	5,000	59,000	5.60			
SB-14	4/9/2018					<50		4,200										14,000	<100	8,400	80,000	5.76			
SB-14	7/25/2018 ¢							5,100										9,800		6,100	56,000	5.61			
SB-14	11/28/2018					<50		4,500										7,800	<100	6,300	<5,000	5.96			
SB-14	4/26/2019					<50		8,700										19,000	<100	3,700	91,000	5.74			
SB-14	11/15/2019					<50		5,000										12,000	<100	7,800	69,000	5.94			
SB-14	4/23/2020					<50		5,500										9,200	<100	5,500	52,000	5.63			
SB-14	11/12/2020					<50		4,000										4,700	<100	15,000	68,000	5.10			
SB-14	2/4/2021 ¢							7,900										34,000		6,000	95,000	5.30			
SB-14	4/28/2021					<50		3,300										4,000	<100	7,100	42,000	5.37			
SB-14	11/15/2021					<50		3,400							11,000			9,300	<100	16,000	64,000	5.55			
SB-14	4/11/2022					<50		4,400										12,000	<100	9,600	44,000	5.76			

Notes:
1. Samples were collected by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire on the dates indicated and analyzed by EAI for select metals by USEPA Method 6020. Additional analysis for select wet chemistry parameters were completed by EAI. Analysis for radium 226 and 228 was completed by KNL Environmental Testing, Inc., of Tampa, Florida. Analysis for lithium was completed by SGS Accutest, of Marlborough, Massachussets (Feb. 2016) and Katahdin Analytical Services, of Scarborough, Maine (April 2016 through October 2016).

2. Concentrations are presented in micrograms per liter (µg/L), which are equivalent to parts per billion (ppb), or they are presented in picoCuries per liter (pCi/L) or pH standard units.

3. "<" indicates the analyte was not detected above the indicated laboratory reporting limit.
A blank indicates the sample was not analyzed for this parameter.

4. "GW-1" and "GW-2" 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 equivalent to the Ambient Groundwater Quality Standards (AGQSs) promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water. The GW-2 Groundwater Standards apply to groundwater as a potential source of indoor air contamination.

5. "Drinking Water MCLs" are from the United States Environmental Protection Agency (EPA) website (accessed March 22, 2016). The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are enforceable standards for drinking water systems.
"CCR Alt. Standards" were codified in 40 CFR Part 257.95(h)(2) for cobalt, lead, lithium, and molybdenum. These are alternative risk-based standards for the four constituents without MCLs that may require establishment of a groundwater protection standard under the coal combustion residuals (CCR) rules 40 CFR Part 257(h).

6. "*" indicates an MCL value is not currently available, and the listed value is an action level.
"†" indicates the RCMP lists the value as not currently available.
"‡" indicates the value provided is typically applied to field-filtered samples (i.e., dissolved analytes) for overburden monitoring wells.
"NA" indicates the RCMP lists the value as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the retesting program for identifying statistically significant increases (SSIs).

TABLE 2
Groundwater Level Measurements Summary
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Date	Depths and elevations in feet.																
	SB-1			SB-4			SB-6			SB-13			SB-14			Inferred General Groundwater Flow Rate (feet/day)	Inferred General Groundwater Flow Direction
	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation	Reference Elevation	Depth to Water	Water Elevation		
Feb-16	240.85	33.82	207.03	274.26	67.36	206.90	268.77	61.84	206.93	219.86	11.83	208.03	242.70	34.88	207.82	0.5 - 2.7	Northeast
Apr-16	240.85	32.19	208.66	274.26	65.63	208.63	268.77	60.07	208.70	219.86	10.16	209.70	242.70	33.13	209.57	0.5 - 2.5	Northeast
Jun-16	240.85	31.84	209.01	274.26	66.24	208.02	268.77	60.80	207.97	219.86	11.11	208.75	242.70	33.93	208.77	0.4 - 1.9	East
Jul-16	240.85	33.88	206.97	274.26	67.30	206.96	268.77	62.07	206.70	219.86	12.41	207.45	242.70	35.10	207.60	0.4 - 1.9	Northeast
Aug-16	240.85	35.09	205.76	274.26	68.54	205.72	268.77	63.19	205.58	219.86	13.76	206.10	242.70	36.39	206.31	0.3 - 1.4	Northeast
Oct-16	240.85	36.20	204.65	274.26	69.68	204.58	268.77	64.42	204.35	219.86	13.92	205.94	242.70	37.58	205.12	0.8 - 3.9	North-Northeast
Nov-16	240.85	36.40	204.45	274.26	69.93	204.33	268.77	64.69	204.08	219.86	15.14	204.72	242.70	37.80	204.90	0.3 - 1.6	East-Northeast
Apr-17	240.85	32.27	208.58	274.26	65.82	208.44	268.77	60.04	208.73	219.86	9.58	210.28	242.70	32.99	209.71	0.8 - 3.8	North-Northeast
Nov-17	240.85	32.87	207.98	274.26	66.39	207.87	268.77	60.97	207.80	219.86	11.33	208.53	242.70	34.08	208.62	0.4 - 1.8	Northeast
Apr-18	240.85	31.13	209.72	274.26	64.58	209.68	268.77	58.93	209.84	219.86	8.74	211.12	242.70	31.94	210.76	0.6 - 3.2	North-Northeast
Jul-18	240.85	32.60	208.25	274.26	66.01	208.25	268.77	60.84	207.93	219.86	11.13	208.73	242.70	33.78	208.92	0.4 - 2.0	Northeast
Nov-18	240.85	29.99	210.86	274.26	63.59	210.67	268.77	57.92	210.85	219.86	7.66	212.20	242.70	30.82	211.88	0.7 - 3.3	Northeast
Apr-19	240.85	29.83	211.02	274.26	63.34	210.92	268.77	57.60	211.17	219.86	7.51	212.35	242.70	30.72	211.98	0.6 - 2.9	North-Northeast
Jul-19	–	–	–	–	–	–	268.77	58.71	210.06	–	–	–	–	–	–	–	–
Nov-19	240.85	34.48	206.37	274.26	67.96	206.30	268.77	62.66	206.11	219.86	13.21	206.65	242.70	35.85	206.85	0.3 - 1.3	East-Northeast
Feb-20	–	–	–	274.26	66.67	207.59	268.77	61.12	207.65	–	–	–	–	–	–	–	–
Apr-20	240.85	31.84	209.01	274.26	65.34	208.92	268.77	59.73	209.04	219.86	9.62	210.24	242.70	32.75	209.95	0.6 - 3.0	North-Northeast
Jul-20	–	–	–	274.26	66.00	208.26	–	–	–	219.86	11.00	208.86	–	–	–	–	–
Nov-20	240.85	35.72	205.13	274.26	69.23	205.03	268.77	63.92	204.85	219.86	14.48	205.38	242.70	37.09	205.61	0.3 - 1.3	East-Northeast
Feb-21	240.85	33.85	207.00	274.26	67.36	206.90	–	–	–	219.86	12.12	207.74	242.70	34.88	207.82	–	–
Apr-21	240.85	33.37	207.48	274.26	66.88	207.38	268.77	61.31	207.46	219.86	11.43	208.43	242.70	34.38	208.32	0.5 - 2.4	Northeast
Sep-21	240.85	31.11	209.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nov-21	240.85	31.65	209.20	274.26	65.17	209.09	268.77	59.72	209.05	219.86	10.04	209.82	242.70	32.78	209.92	0.4 - 1.9	Northeast
Apr-22	240.85	31.10	209.75	274.26	64.61	209.65	268.77	59.12	209.65	219.86	9.22	210.64	242.70	32.05	210.65	0.5 - 2.5	Northeast

Notes:

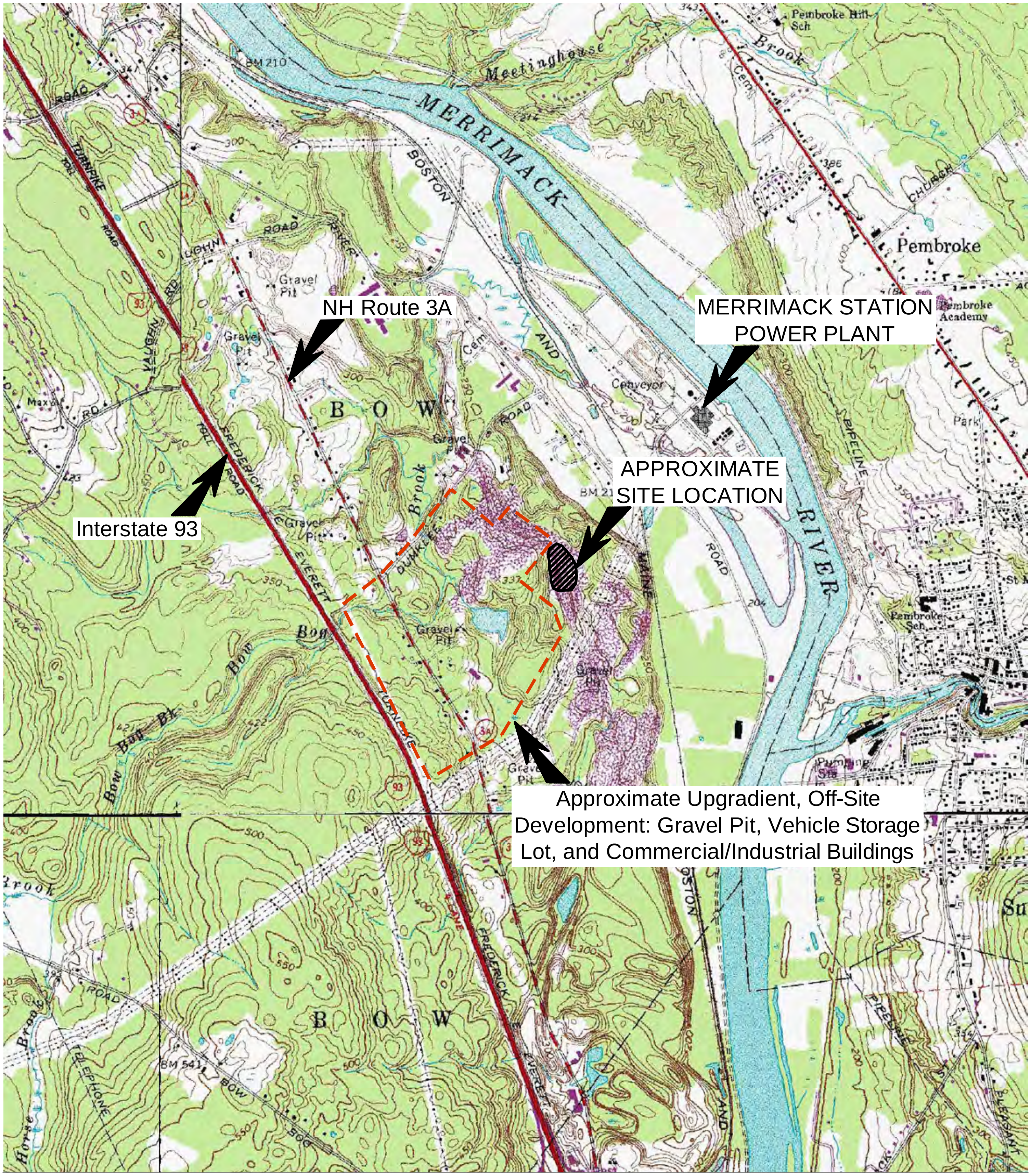
1. Depths to water were obtained from information provided in laboratory reports and field sampling sheets prepared by Eastern Analytical, Inc.

2. Inferred general groundwater flow rates and flow directions are approximate and are based on the limited hydrogeologic and groundwater elevation data available. Other interpretations are possible and actual conditions may vary from those indicated. Note that groundwater elevations, directions, and rates may change due to seasonal or other variations in temperature, precipitation, runoff, or other factors.

3. Approximate groundwater flow rates were calculated using an assumed saturated hydraulic conductivity of 100 to 500 feet per day, and an assumed porosity of 39%. Assumptions are consistent with values typical of medium-grained, clean sand. The calculated groundwater flow rate is equivalent to the average interstitial velocity or the seepage velocity.

Figures

File: P:\2000s\2025.13\Graphics Files\CAD\2022 November Report\Nov22 Locus.dwg User: ddombrowsky Plot Date: 10-28-22 5:02 AM



N
W
E
S

NOTES:

BASE MAP TAKEN FROM 7.5 MINUTE USGS QUADRANGLE MAP: BOW, NEW HAMPSHIRE 1967 (PHOTO REVISED 1998)

Drawn By: D. Dombrowsky
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.13
Date: November 2022

1000 0 2000 Feet

SANBORN HEAD

Figure 1
Locus Plan

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

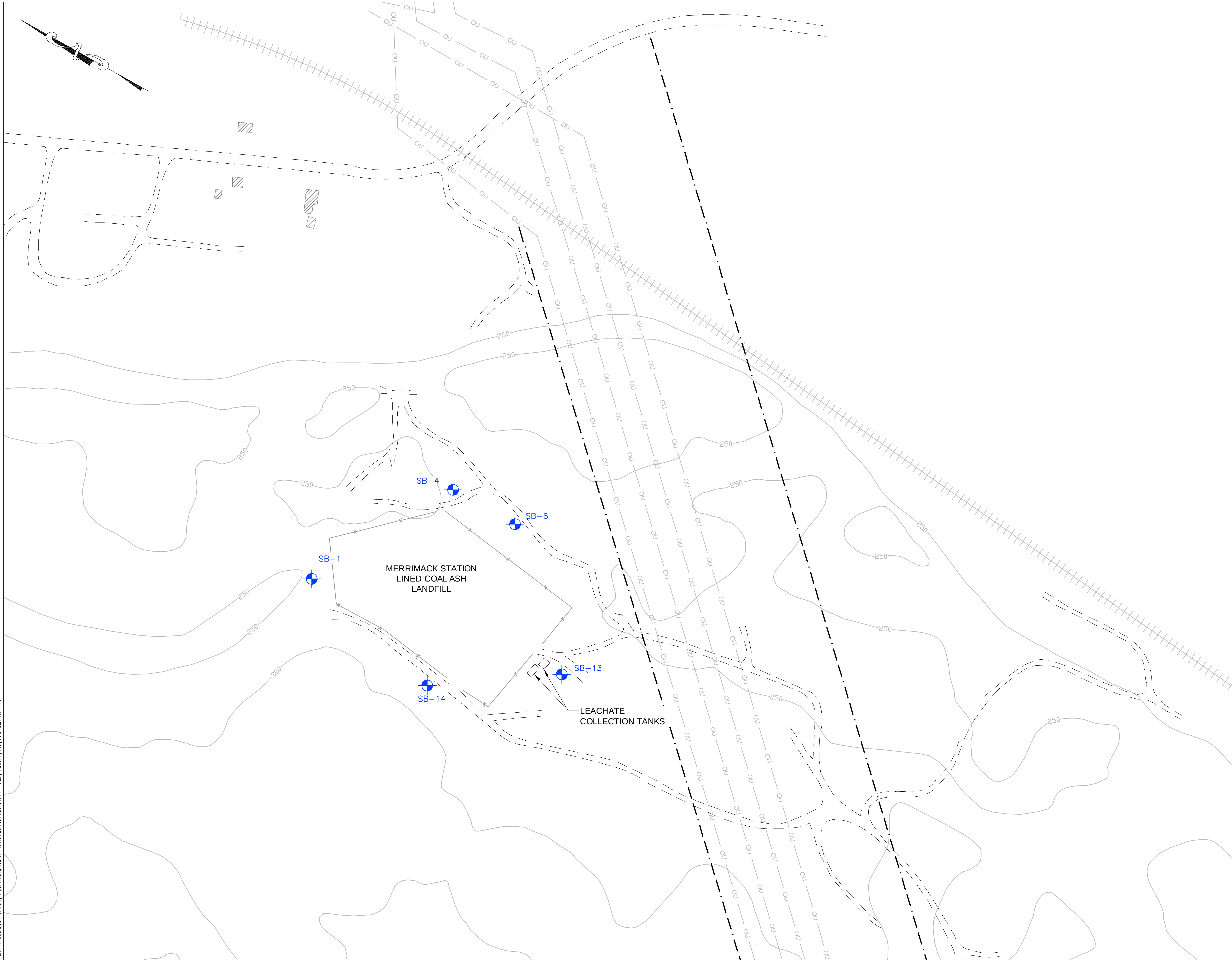


Figure 2

Facility Plan

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: D. Dombrowsky
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.13
Date: November 2022

Notes

1. The base map was developed from a drawing prepared by Public Service Company of New Hampshire's Engineering Division entitled, "Area Plan, Merrimack Station, Bow, N.H." The drawing was dated 5/1/90 and was last revised on 6/28/95.

2. The location of the landfill and the site features shown should be considered approximate.

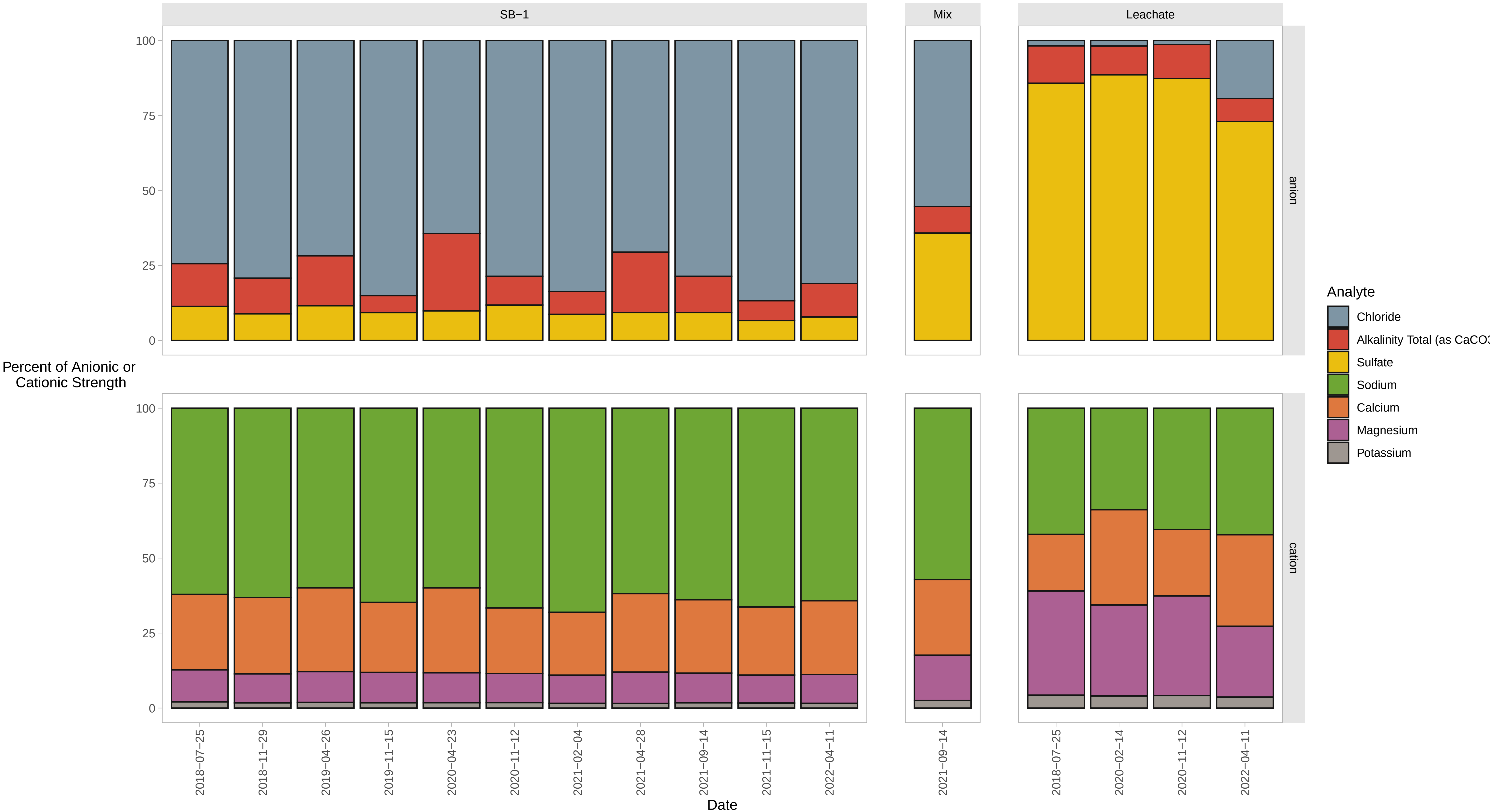
Legend

SB–4 Monitoring Well
Right-Of-Way
Fence
OU Overhead Utilities
250 Elevation Contour

150' 75' 0 150' 300' Feet

SANBORN HEAD

Figure 3 − SB−1 Major Ion Signature Samples
With Project−Specific Major Ion List Analyzed



Notes:
Only samples with analysis of project−specific major ions are plotted.
The hypothetical mix sample is based on the well and leachate samples collected on April 11, 2022.
See text for additional assumptions and details.

Sanborn, Head & Associates, Inc. | P:/2000s/2025.13/Work/202211 ASD

Attachment A

Qualified Professional Engineer Certification

ATTACHMENT A

QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I certify that the information in this alternative source demonstration (ASD) report, dated November 3, 2022 (the "Report"), is accurate, subject to the assumptions and limitations contained within the Report. The ASD report was prepared by Sanborn, Head & Associates, Inc. for the Merrimack Station Coal Ash Landfill site located in Bow, New Hampshire.

Harrison R. Roakes
Printed Name of Licensed Professional Engineer

Signature

License Number	Licensing State	Date
15920	New Hampshire	11/3/2022

Appendix B

Limitations

ATTACHMENT B
LIMITATIONS

1. The conclusions and recommendations described in this report are based in part on the data obtained from a limited number of groundwater samples from widely-spaced monitoring locations. The monitoring locations indicate conditions only at the specific locations and times, and only to the depths sampled. They do not necessarily reflect variations that may exist between such locations, and the nature and extent of variations between these monitoring locations may not become evident until further study or remediation is initiated. The validity of the conclusions is based in part on assumptions Sanborn Head has made about conditions at the site. If conditions different from those described become evident, it will be necessary to re-evaluate the conclusions of this report.
2. Water level measurements were made in the monitoring well locations at times and under conditions stated within the report. Fluctuations in the levels of the groundwater may occur due to variations in precipitation and other factors not evident at the time measurements were made.
3. Quantitative laboratory analyses were performed as noted within the report. Additional analytes not searched for during the current study may be present in groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Additionally, variations in the types and concentrations of analytes and variations in their distributions within the groundwater may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
4. Quantitative laboratory analyses were performed as noted within the report. Additional analytes not searched for during the current study may be present in groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Additionally, variations in the types and concentrations of analytes and variations in their distributions within the groundwater may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
5. This report was prepared for the exclusive use of GSP Merrimack LLC (GSP) for specific application for 40 CFR Part 257.90 compliance for GSP's Merrimack Station Coal Ash landfill in Bow, New Hampshire, and was prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

P:\2000s\2025.13\Source Files\202211 ASD\Att B - Limitations\Limitations.docx