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Sanborn, Head & Associates, Inc.

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2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

MERRIMACK STATION COAL ASH LANDFILL

Bow, New Hampshire

Prepared for GSP Merrimack LLC
File No. 2025.08
January 2020

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Building Trust. Engineering Success.

Mr. Allan Palmer
GSP Merrimack LLC
431 River Road
Bow, New Hampshire 03304

January 28, 2020
File No. 2025.08

Re: 2020 Annual Groundwater Monitoring and Corrective Action Report
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Dear Allan:

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 2020 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, 2019 through December 31, 2019.

REPORT REQUIREMENTS

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

- A map, aerial image, or diagram showing the Site and the background (or upgradient) and downgradient monitoring wells that are part of the groundwater monitoring program for the Site;
- Locations of the monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;
- Monitoring data obtained under 40 CFR Parts 257.90 through 257.98, including:
  - the number of groundwater samples that were collected for analysis for each background and downgradient well;
  - the dates the samples were collected; and
  - whether the sample was required by the detection monitoring or assessment monitoring programs;
- 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); and
- Other information required to be included in the annual report as specified in 40 CFR Parts 257.90 through 257.98, including;

- 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
- 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)).

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 for nearly 40 years 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-006, dated March 16, 2017, 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, available in the Site's operating record), 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.

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 sampling and analysis 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 January 19, 2010.

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 2019 and November 2019. Additional samples were collected on July 11, 2019 as part of a resampling routine for the April 2019 monitoring round. 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 analytical laboratory reports are provided in Attachment B. The groundwater level measurements and inferred general groundwater flow directions are summarized in Table 2.

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 July 11, 2019. The certification is available in the Site's operating record. Statistical analysis of the November 2019 data is ongoing and future statistical analyses of additional groundwater monitoring data reviewed by Sanborn Head under 40 CFR Part 257.93 may result in a change to the statistical method used, and future certifications will need to be revised accordingly.

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 November 2018 and April 2019 monitoring rounds, SSIs over background levels were identified. As such, pursuant to 40 CFR Part 257.94(e)(2), within 90 days of detecting the SSI, Sanborn Head prepared Alternative Source Demonstrations (ASDs) that demonstrated, based on a weight-of-evidence approach, that the SSIs were due to natural variation in groundwater

flow. The SSIs and corresponding ASDs are summarized in Exhibit 1, below. The ASDs are provided as Attachment A.

Exhibit 1: Alternative Source Demonstrations Completed in 2019

Sampling & Resampling Dates	SSI Location and Parameter	ASD Date
November 29, 2018	SB-1: Calcium and sulfate SB-4: Calcium SB-14: Sulfate	May 28, 2019
April 26, 2019 & July 11, 2019	SB-6: Sulfate	October 22, 2019

Data for the November 2019 groundwater detection monitoring round are included in Table 1; however, the statistical analysis for the November 2019 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 laboratory analyses were received December 6, 2019, and the statistical analysis is due by March 5, 2020.

CONCLUSION

We understand that GSP Merrimack LLC will be responsible for placing this Annual Report in the Site's operating record by January 31, 2020. The next Annual Report will be due January 31, 2021 for the time period from January 1, 2020 through December 31, 2020. Should you require additional information, please contact Harrison Roakes of Sanborn Head at (603) 415-6126.

Sincerely,
SANBORN, HEAD & ASSOCIATES, INC.

Harrison R. Roakes, P.E.
Project Manager

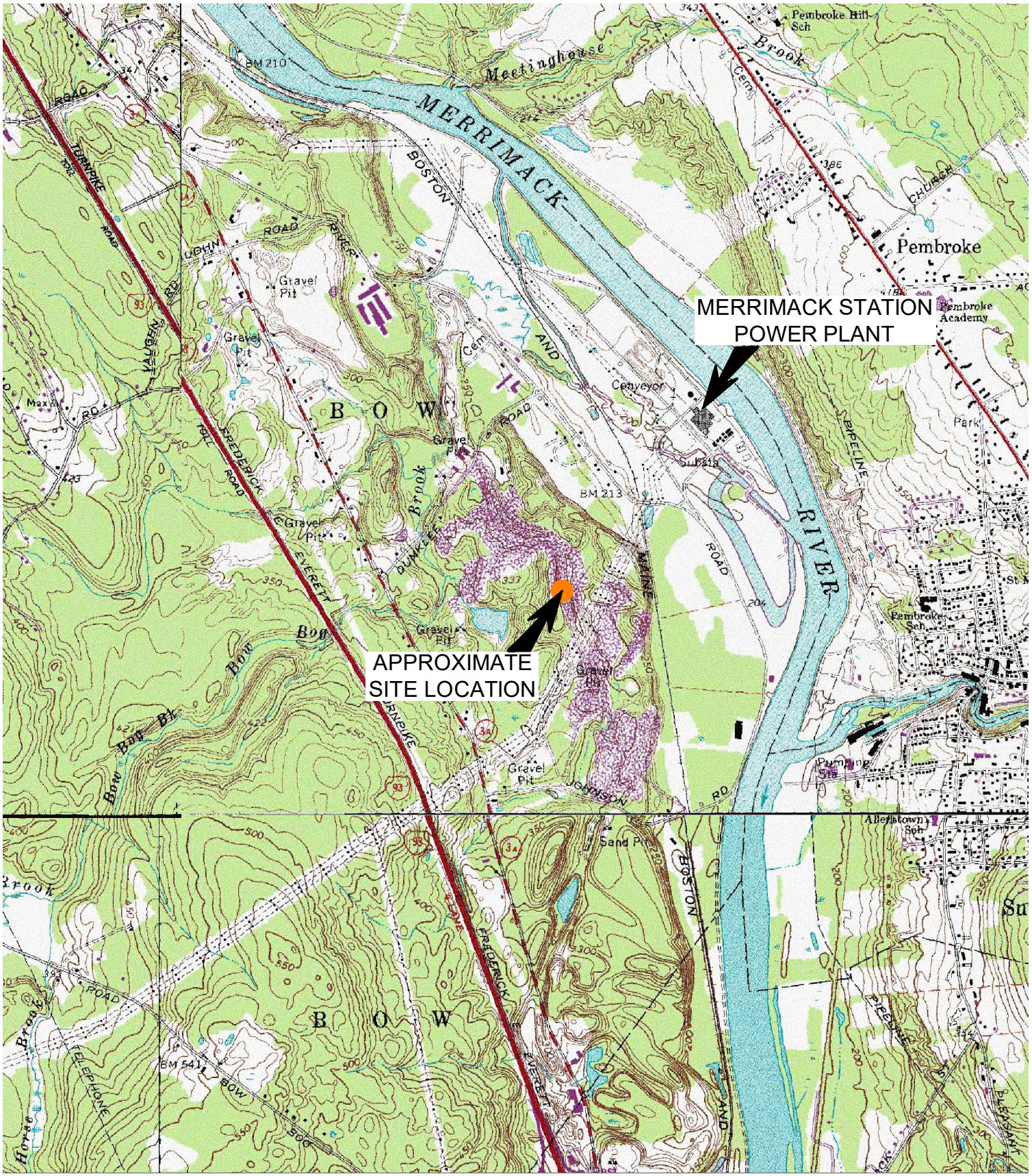
Eric S. Steinhauser, P.E., CPESC, CPSWQ
Senior Vice President

HRR/ESS: hrr

Enclosures:

	Figure 1	Locus Plan
	Figure 2	Facility Plan
	Table 1	Groundwater Analytical Results Summary
	Table 2	Groundwater Level Measurements Summary
	Attachment A	Alternative Source Demonstrations
	Attachment B	Analytical Laboratory Reports

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: Steinhauser
Project No: 2025.08
Date: January 2020

1000 0 2000 Feet

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Figure 1

Locus Plan

2020 Annual Groundwater Monitoring and Corrective Action Report

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

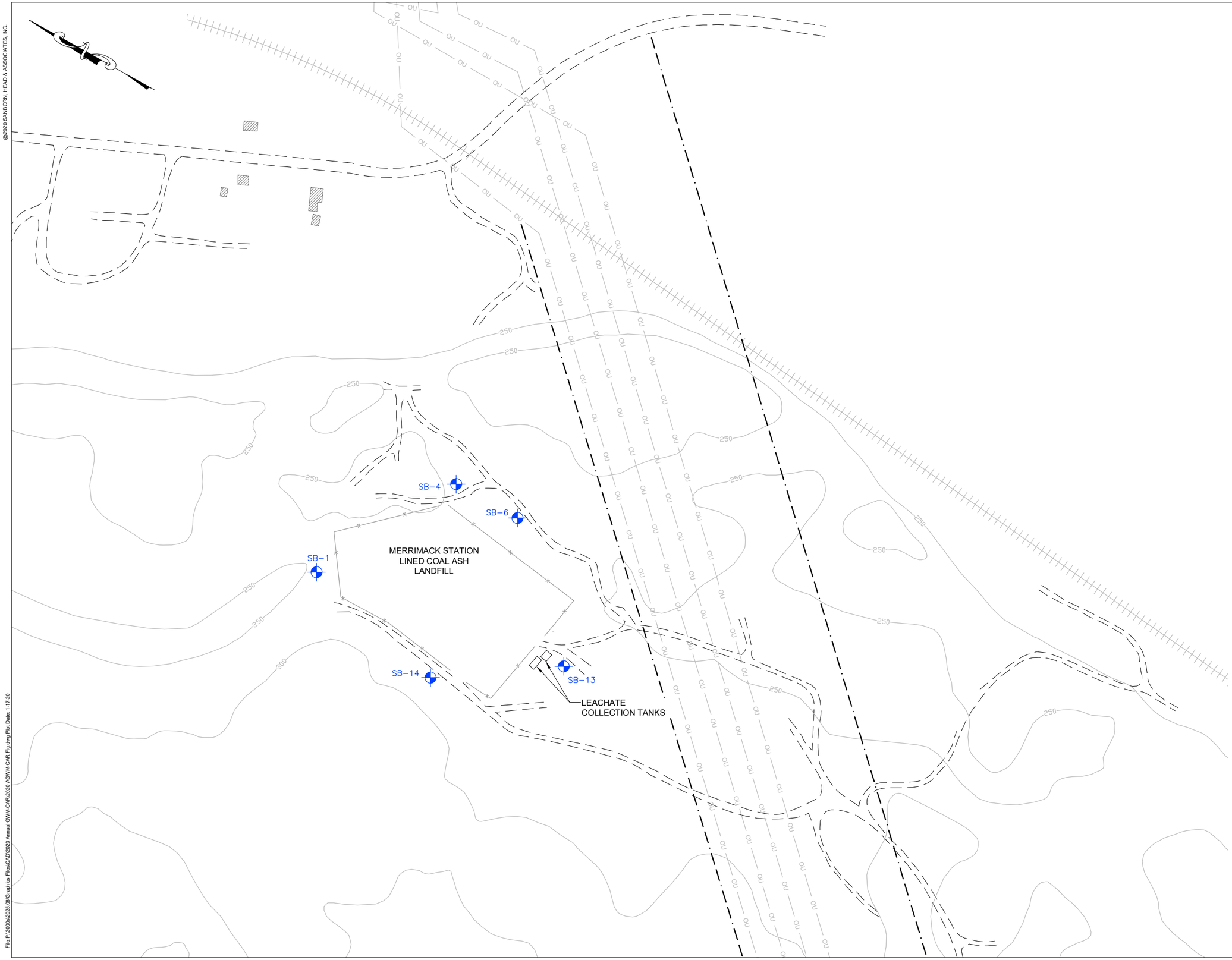

Figure 2

Facility Plan

2020 Annual Groundwater Monitoring and Corrective Action Report

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: D. Dombrowsky
Designed By: H. Roakes
Reviewed By: E. Steinhauser
Project No: 2025.08
Date: January 2020

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

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File:P:\2000s\2025.08\Graphics Files\CAD\2020 Annual GWM-CAR\2020 AGWMCAR Fig.dwg Plot Date: 1-17-20

TABLES

TABLE 1
Groundwater Analytical Results Summary
2020 Annual Groundwater Monitoring and Corrective Action Report
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Metals																						
		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
GW-1/(AGQS)		6 ‡	10 ‡	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			
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			
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			

TABLE 1
Groundwater Analytical Results Summary
2020 Annual Groundwater Monitoring and Corrective Action Report
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Location	Date	Metals																						
		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
GW-1/(AGQS)		6 ‡	10 ‡	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-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			
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			

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 and September 2018 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.

6. "†" indicates the RCMP lists the value as not currently available.
"‡" indicates the value provided is the corresponding "dissolved metal" NHDES standard for reference only; NHDES standards for total metals are listed in the RCMP.
"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 resampling program for identifying statistically significant increases (SSIs).

TABLE 2
Groundwater Level Measurements Summary
2020 Annual Groundwater Monitoring and Corrective Action Report
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

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.

ATTACHMENT A

ALTERNATIVE SOURCE DEMONSTATIONS

May 2019

SANBORN HEAD

Building Trust. Engineering Success.

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

May 28, 2019
File No. 2025.08

Re: Alternative Source Demonstration
Data Collected November 2018
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. This ASD was prepared in accordance with the Coal Combustion Residual (CCR) Rules (40 CFR Part 257). This report is subject to the Limitations provided in Attachment A.

INTRODUCTION

Based on the prediction interval procedure performed by Sanborn Head, statistically significant increases (SSIs) compared to background were identified at monitoring wells SB-1 (calcium and sulfate), SB-4 (calcium), and SB-14 (sulfate).[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.

Using a weight-of-evidence approach, we conclude that the SSIs are due to natural variation in groundwater chemistry based on the following findings.

- Detected concentrations of sulfate and calcium are within the range of naturally occurring concentrations.
- Groundwater flow conditions and groundwater chemistry naturally vary over time at the site. The variation in groundwater chemistry data that resulted in SSIs at SB-1, SB-4, and SB-14 are consistent with the natural variation in groundwater chemistry observed at the site.

[1] The Fall 2018 laboratory analytical data were received on December 12, 2018. The site operator elected not to collect confirmatory samples, which were allowed with the "1-of-2" retesting strategy, and the SSIs were determined on February 27, 2019. The statistical analyses are summarized in the Statistical Method Selection Certification, dated May 4, 2018.

- Comparison of major ions in groundwater and in landfill leachate do not indicate leachate impacts to groundwater at the site.

Groundwater chemistry data are provided in Table 1, and monitoring well locations are depicted in Figures 1.A through 1.G.

NATURALLY OCCURING CONCENTRATIONS

The concentrations of calcium and sulfate associated with the SSIs are within the range of naturally occurring concentrations for comparable groundwaters, as reported in local, state-wide, and regional studies, summarized in Exhibit 1, below.[2,3,4] The local 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.

Exhibit 1: Comparison of Site Calcium and Sulfate Concentrations to Literature Values

Study/Location	Calcium (µg/L)		Sulfate (µg/L)	
Local Stratified Drift Aquifers [sample size (n)=16]	Min.: Median: Max.:	3,400 4,650 8,600	Min.: Median: Max.:	1,000 7,500 14,000
New Hampshire Stratified Drift Aquifers [n=255]	Min.: Median: Max.:	40 7,600 87,000	Min.: Median: Max.:	<100 7,800 79,000
Northeast Crystalline Rock Aquifers [n=117]	Min.: Median: Max.:	2,700 19,800 98,500	Min.: Median: Max.:	310 13,420 68,480
SB-1 (SSI data in **bold**)	April 2018: July 2018: Nov. 2018:	**12,000** **12,000** **13,000**	April 2018: July 2018: Nov. 2018:	**10,000** **13,000** **10,000**
SB-4 (SSI data in **bold**)	April 2018: July 2018: Nov. 2018:	11,000 9,800 **12,000**	April 2018: July 2018: Nov. 2018:	12,000 11,000 13,000
SB-13 (site upgradient well –SSI methodology not applicable)	April 2018: July 2018: Nov. 2018:	11,000 10,000 13,000	April 2018: July 2018: Nov. 2018:	8,000 8,700 7,200
SB-14 (SSI data in **bold**)	April 2018: July 2018: Nov. 2018:	4,200 5,100 4,500	April 2018: July 2018: Nov. 2018:	**8,400** **6,100** **6,300**

[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*.

Calcium

Calcium occurs naturally in groundwater in the region through dissolution of calcium-producing minerals (e.g., calcite). Although the calcium concentrations at SB-1 and SB-4 were greater than the concentrations in the local study, the SSI concentrations were equal to or less than the concentration detected at the upgradient well SB-13 in November 2018, well within the range of values for New Hampshire wells, and were less than the regional median concentration. There is no New Hampshire Ambient Groundwater Quality Standard (AGQS) or United States Environmental Protection Agency (USEPA) maximum contaminant level (MCL) for calcium because it is not considered a health risk at concentrations commonly detected in groundwater and drinking water.

Sulfate

Sulfate occurs naturally in groundwater in the region through dissolution of sulfate-producing minerals (e.g., sulfide minerals). The sulfate data that resulted in SSIs at SB-1 and SB-14 were within the range of sulfate concentrations reported in the local and state studies, and the SSI concentrations were less than the median reported in the regional study. Additionally, the sulfate concentrations detected at the site were much less than the New Hampshire Ambient Groundwater Quality Standard (AGQS) for sulfate of 500,000 µg/L. The AGQSs are intended to be protective of groundwater as a source of drinking water.

NATURAL VARIATION DUE TO GROUNDWATER FLOW

Groundwater flow conditions (i.e., groundwater flow direction, flow rate, and elevations) at the site vary over time. The overall flow direction at the site is predominantly to the northeast with a shallow hydraulic gradient (i.e., on the order of 0.001 feet per foot [ft/ft]), although flow direction can change to either more northerly (i.e., north-northeast) or more easterly (i.e., east). Tabulated flow conditions for each monitoring event are provided as Table 2, and groundwater contour maps representative of the varying flow were prepared for June 2016, November 2016, April 2017, November 2017, April 2018, July 2018, and November 2018 (provided as Figures 1.A through 1.G, respectively). These tabulated values and groundwater contour maps demonstrate the variability in groundwater flow conditions observed at the site.

Trends in groundwater elevations and trends in groundwater chemistry (e.g., concentrations of calcium and sulfate) are correlated, as discussed below in the context of each individual SSI. These fluctuations are not indicative of impacts from the CCR unit because both upgradient and downgradient monitoring wells show similar temporal changes in groundwater chemistry. Fluctuations are more likely associated with natural sources of groundwater chemistry variation, like mineralogical composition of the upgradient aquifer material, groundwater age, or precipitation and infiltrate characteristics.

In addition to natural sources of groundwater chemistry fluctuation that may be associated with changes in groundwater flow conditions, anthropogenic activities in the area are another potential source of variation in the groundwater chemistry at the site. One potential source is the ongoing sand and gravel mining occurring upgradient and cross-gradient of the site. Mining activities in the area include approximately 30 acres of non-vegetated area and

a drainage feature recently installed directly upgradient/cross-gradient of SB-1 (aerial photographs indicate the apparent vegetated swale was installed between April 2016 and September 2017).

Calcium (SSI at SB-1 and SB-4)

Natural variability in calcium concentrations was observed at the site, including at the two wells most upgradient of SB-1 and SB-4 (i.e., SB-13 and SB-14). A timeseries plot of groundwater elevations and calcium concentrations at the site monitoring wells, included as Figure 2A, relates variation in groundwater elevations and calcium concentrations over time. For example, there was a relatively steady, downward trend in both groundwater elevation and calcium concentrations at most site wells (including upgradient wells) from April 2016 through December 2016. When groundwater elevations increased in April 2017 through July 2018, there was an increase in calcium concentrations and variability. These data demonstrate that, considering the variability in calcium concentrations at upgradient wells, the variability in calcium concentrations at SB-1 and SB-4 that resulted in an SSI was consistent with natural variation at the site.

Sulfate (SSI at SB-14)

Sulfate concentrations at the most upgradient monitoring well SB-13 ranged from 6,000 to 9,000 µg/L during the CCR monitoring period, with a median concentration of 8,000 µg/L. The sulfate concentration detected at SB-14 in November 2018 that resulted in the SSI was 6,300 µg/L. For the three most recent monitoring events, when SSIs were detected at SB-14, sulfate concentrations at SB-14 were greater than the maximum concentrations detected in the first eight samples collected, which were considered the background data. Groundwater contour maps for the monitoring rounds corresponding to the SSI data (i.e., Figure 1.E for April 2018, Figure 1.F for July 2018, and Figure 1.G for November 2018) indicate SB-14 and SB-13 were cross gradient to each other and indicate they were both upgradient or cross gradient of the landfill. Based on the hydrologic conditions at the time of sampling and the comparable sulfate concentrations measured at the site upgradient well SB-13, the variability in sulfate concentrations at SB-14 that resulted in an SSI was consistent with natural variation at the site.

Sulfate (SSI at SB-1)

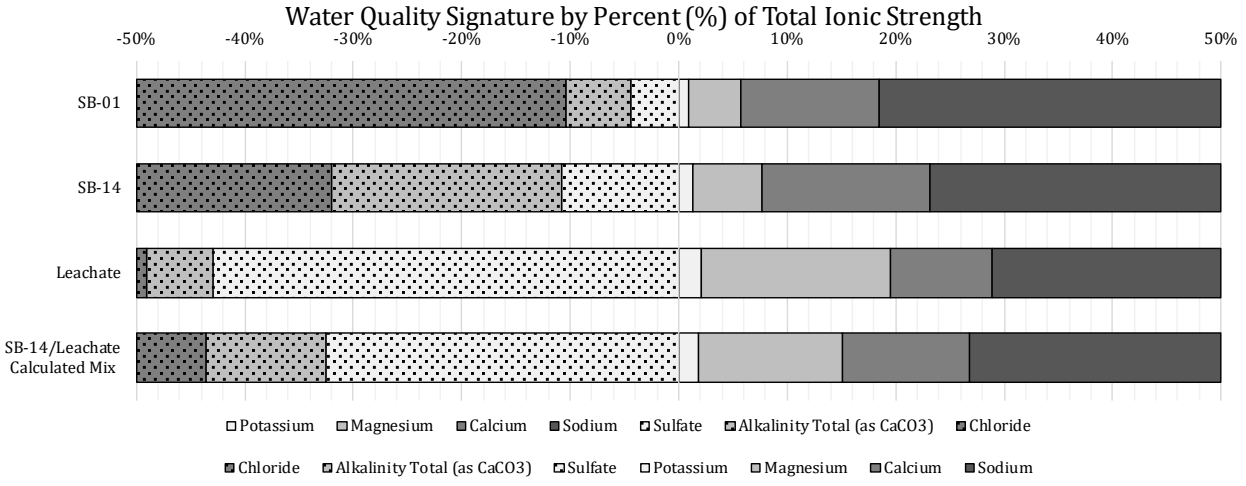
Natural variability in sulfate concentrations was observed at the site, including the two wells most upgradient of SB-1 (i.e., SB-13 and SB-14). The timeseries plot of groundwater elevations and sulfate concentrations at these wells, included as Figure 2B, relates variation in groundwater elevations and sulfate concentrations over time. For the three most recent monitoring events, sulfate concentrations at SB-14 were greater than the maximum concentrations detected in the first eight samples collected at SB-14. The sulfate data that resulted in an SSI at SB-1 follow a similar pattern of increased sulfate in the latest three monitoring rounds. Considering the variability in sulfate concentrations at upgradient wells, particularly during the last three monitoring events, the variability in sulfate concentrations at SB-1 that resulted in an SSI was consistent with natural variation at the site.

COMPARISON OF GENERAL WATER CHEMISTRY

Additional analyses were completed in July and November 2018 to collect information on the major ion chemistry at the five site monitoring wells. The results of the November 2018 analyses are presented as plotted values on Figure 3, along with major ion chemistry data for the leachate collection system collected in July 2018. Based on the major ion analyses, the leachate was characterized as a sodium-magnesium-sulfate water type. The November 2018 and July 2018 data major ion chemistry data were similar, with groundwater samples for SB-1, SB-4, SB-6, and SB-13 considered sodium-chloride water types. Monitoring well SB-14, the monitoring well with the least total dissolved solids (TDS), was sodium-potassium dominant but did not have a dominant anion type.

To better characterize the SSIs of sulfate and calcium at SB-1, the major ion chemistry at SB-1 was compared with the major ion chemistry at an upgradient well and of the leachate. Although SB-13 is the monitoring well most upgradient of the landfill, based on groundwater elevation contours for the November 2018 monitoring round, SB-14 was the most upgradient well to SB-1 at the time the major ion chemistry samples were collected. The percent contributions for each major cation and anion for SB-1, SB-14, the leachate, and a hypothetical, calculated mix of SB-14 groundwater and leachate are presented in Exhibit 2, below. The relative percent contributions for the hypothetical mix of SB-14 water and leachate were based on a mix of waters that would result in a TDS concentration equivalent to the TDS concentration measured at SB-1.[5]

Exhibit 2: Percent (%) of Total Ionic Strength for Major Anions (-) and Cations (+) at SB-1, SB-14, in Leachate, and for a Hypothetical Leachate/Groundwater Mix



[5] The mixed water calculation was based on a mix of 98.93% SB-14 (TDS = 56,000 µg/L) and 1.07% leachate (TDS = 7,900,000 µg/L), resulting in a TDS concentration equivalent to that measured at SB-1 (TDS = 140,000 µg/L). The July 2018 TDS values were used rather than the November 2018 TDS values because of apparently erroneous, laboratory-provided TDS values for the November 2018 monitoring round.

Based on the relative percent contribution of total ionic strength by major ion presented above, the greater concentrations at SB-1 are not indicative of impacts from leachate. This conclusion is supported by the follow observations.

- In the leachate, sulfate is the dominant anion and chloride concentrations are relatively low. Magnesium and sodium are the most dominant cations.

- If groundwater from SB-14 and leachate are present in a hypothetical mixture at the ratio described previously (i.e., 98.93:1.07), assuming the waters mix conservatively and no third end-member is present in the mixture, then the relative concentration of sulfate in the sample would increase and the relative concentration of chloride would decrease. Similarly, we would expect the relative concentration of magnesium to increase.

- Trends in relative concentrations between SB-1 and SB-14 were opposite of those that might indicate leachate impacts to groundwater at SB-1: a) the relative concentration of sulfate decreased compared to SB-14; b) the relative concentration of chloride increased compared to SB-14; and c) the relative concentration of magnesium decreased compared to SB-14.

CLOSING

Detected concentrations of sulfate and calcium are within the naturally occurring range, the SSIs are consistent with natural variation in groundwater flow conditions and general groundwater chemistry at the site, and a comparison of major ions in groundwater and in landfill leachate do not indicate leachate impacts to groundwater.

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 SSIs at SB-1 (calcium and sulfate), SB-4 (calcium), and SB-14 (sulfate) are due to natural variation in groundwater flow.

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, P.E.
Project Manager

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

HRR/AEA/ESS:hrr

Enclosures: Table 1 – Groundwater Analytical Results Summary
Table 2 – Groundwater Level Measurements Summary
Figures 1.A through 1.G –Groundwater Contours
(June 2016 through November 2018)
Figure 2.A – Calcium Timeseries
Figure 2.B – Sulfate Timeseries
Figure 3 – Water Chemistry Signatures
Attachment A – Limitations
Attachment B – Qualified Professional Engineer Certification
(appended January 7, 2020)

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

Location	Date	Metals µg/L															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
GW-1		6 ‡	10 ‡	2,000 ‡	4 ‡	620 ‡	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	5.2	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	5.7	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	5.5	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	5.4	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	5.2	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	5.6	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	5.6	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	5.8	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	5.7			
	1/31/2018 ¢							12,000																
	4/9/2018					67		12,000									55,000	<100	10,000	160,000	5.9			
	7/25/2018 ¢							12,000									63,000		13,000	140,000	5.9			
	11/29/2018					87		13,000									66,000	<100	10,000	100,000	6.1			
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	5.5	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	5.3	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	5.6	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	5.3	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	5.7	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	5.7	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	5.8	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	5.7	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	5.8			
	4/9/2018					<50		11,000									93,000	<100	12,000	220,000	5.9			
	7/25/2018 ¢							9,800									95,000		11,000	210,000	5.7			
	11/28/2018					<50		12,000									86,000	<100	13,000	83,000	6.3			
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	5.6	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	5.6	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	5.4	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	5.3	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	5.7	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	5.8	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	5.8	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	5.7	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	5.6			
	4/9/2018					<50		7,900									120,000	<100	9,500	240,000	5.6			
	7/25/2018 ¢							11,000									180,000		12,000	310,000	5.4			
	11/28/2018					<50		11,000									150,000	<100	11,000	140,000	5.9			
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	5.3	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	5.5	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	5.5	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	5.3	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	5.4	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	5.1	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	5.7	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	5.6	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	5.8			
	4/9/2018					<50		11,000									170,000	<100	8,000	330,000	5.8			
	7/25/2018 ¢							10,000									190,000		8,700	340,000	5.7			
	11/28/2018					<50		13,000									200,000	<100	7,200	260,000	5.8			
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	5.1	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	5.6	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	5.4	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	5.3	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	5.8	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	5.6	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	5.2	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	5.6	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	5.6			
	4/9/2018					<50		4,200									14,000	<100	8,400	80,000	5.8			
	7/25/2018 ¢							5,100									9,800		6,100	56,000	5.6			
	11/28/2018					<50		4,500									7,800	<100	6,300	<5,000	6.0			

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

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 amendment). 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.

6. "†" indicates the RCMP lists as not currently available.
"‡" indicates the value provided is the corresponding "dissolved metal" NHDES standard for reference only; NHDES standards for total metals are listed in the RCMP.
"NA" indicates the RCMP lists as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the resampling program for identifying statistically significant increases (SSIs).

7. **Bold** values exceed the AGQS/GW-1 Groundwater Standard.
Italic values exceed the GW-2 Groundwater Standard.

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

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.

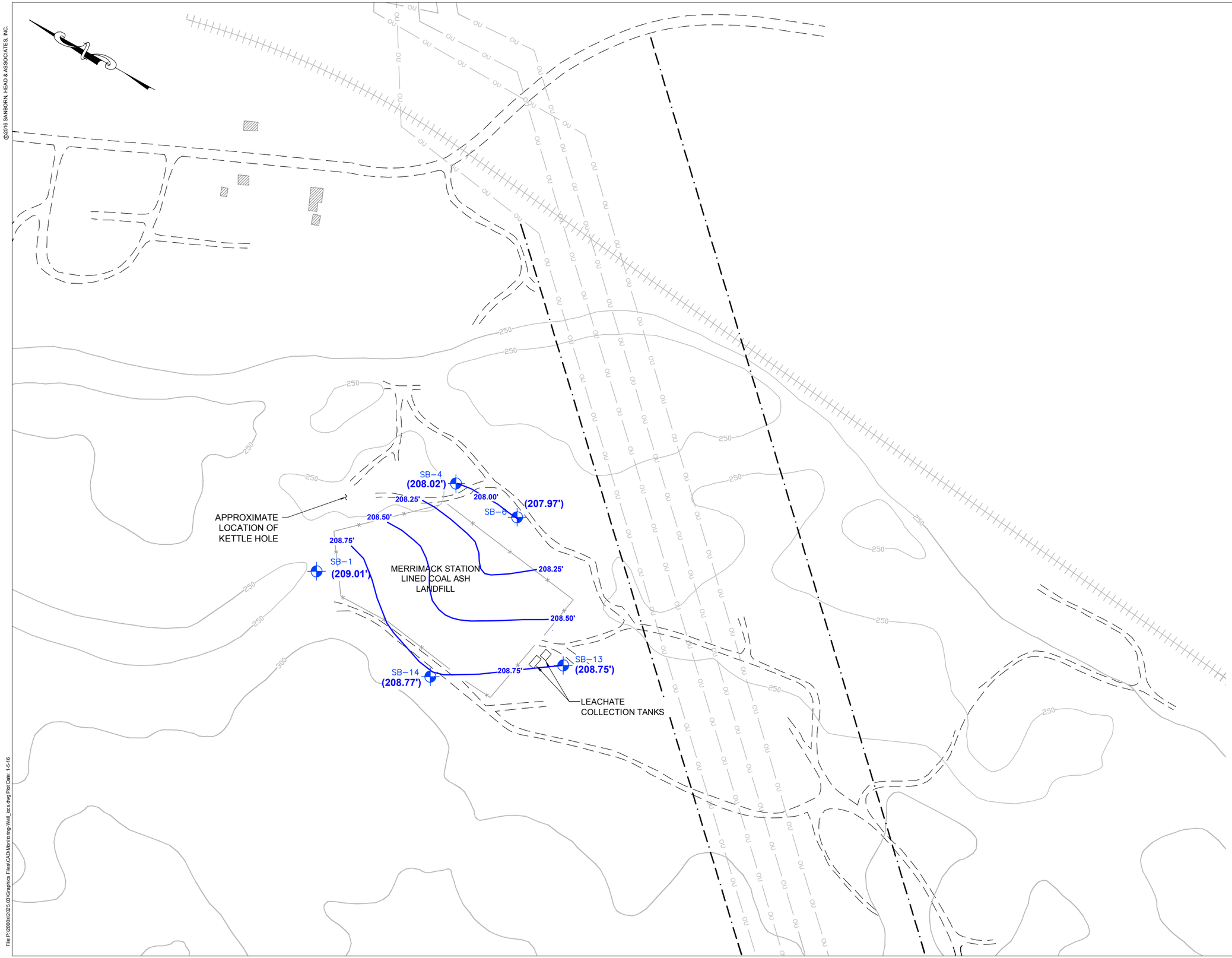


Figure 1.A

June 2016 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on June 6, 2016.

Legend

- SB–4 — Monitoring Well
- (209.01') — Groundwater Elevation Measured on June 6, 2016
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.50' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitring Well_locs.dwg Plot Date: 1-5-16

SB–4
(204.33')

204.20'
SB–6
(204.08')

APPROXIMATE
LOCATION OF
KETTLE HOLE

204.40'

204.20'

SB–1
(204.45')

MERRIMACK STATION
LINED COAL ASH
LANDFILL

204.40'

204.60'

204.60'

204.80'

SB–14
(204.90')

204.80'

SB–13
(204.72')

LEACHATE
COLLECTION TANKS

250 250 250 250 250 250 250 250 250 250 250 300

OU

Figure 1.B

November 2016 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 29, 2016.

Legend

- SB–4 — Monitoring Well
- (204.45') — Groundwater Elevation Measured on Nov. 29, 2016
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 204.60' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitring Well_locs.dwg Plot Date: 1-5-16

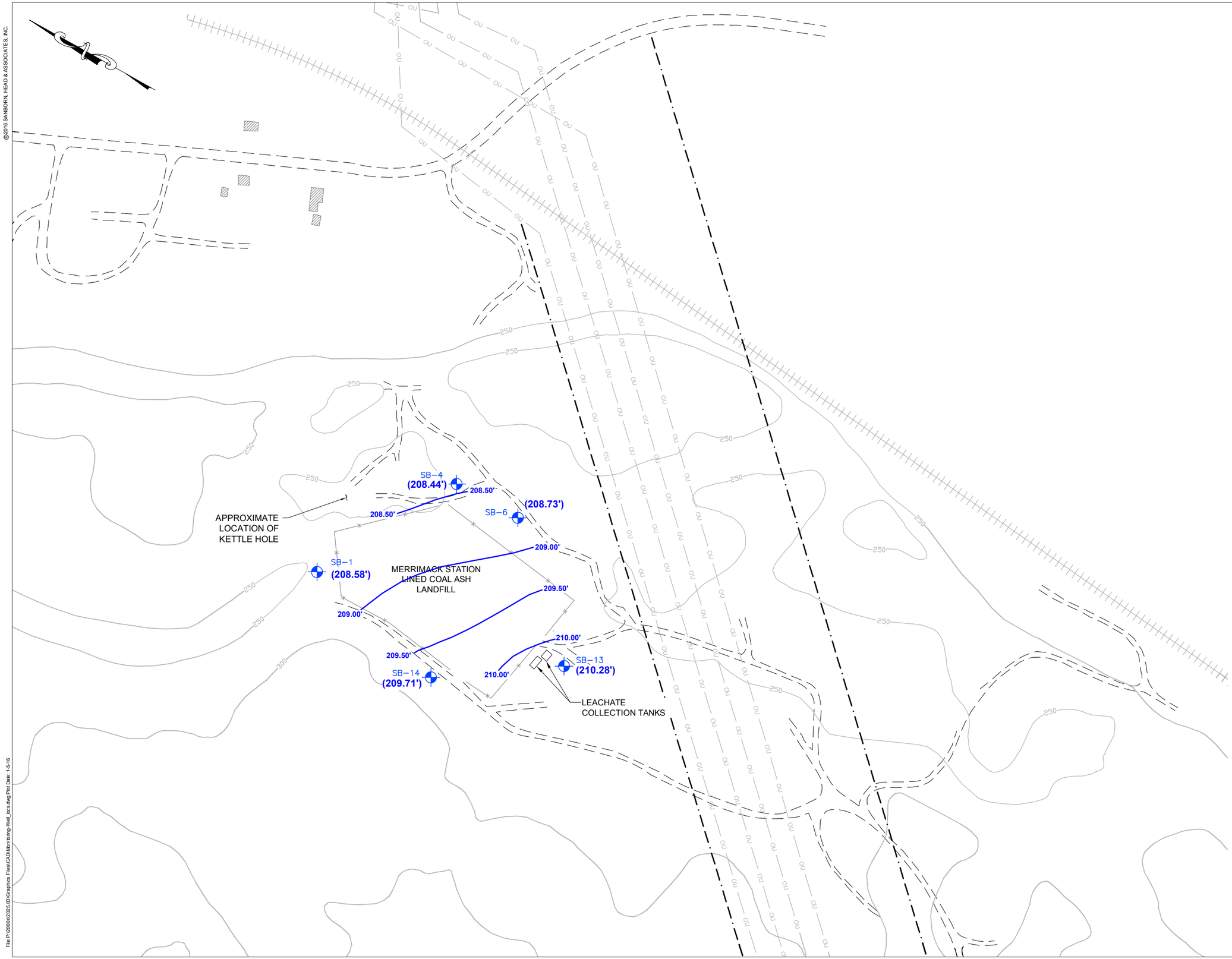


Figure 1.C

April 2017 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on April 19, 2017.

Legend

- SB–4 — Monitoring Well
- (208.58') — Groundwater Elevation Measured on April 19, 2017
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 209.50' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

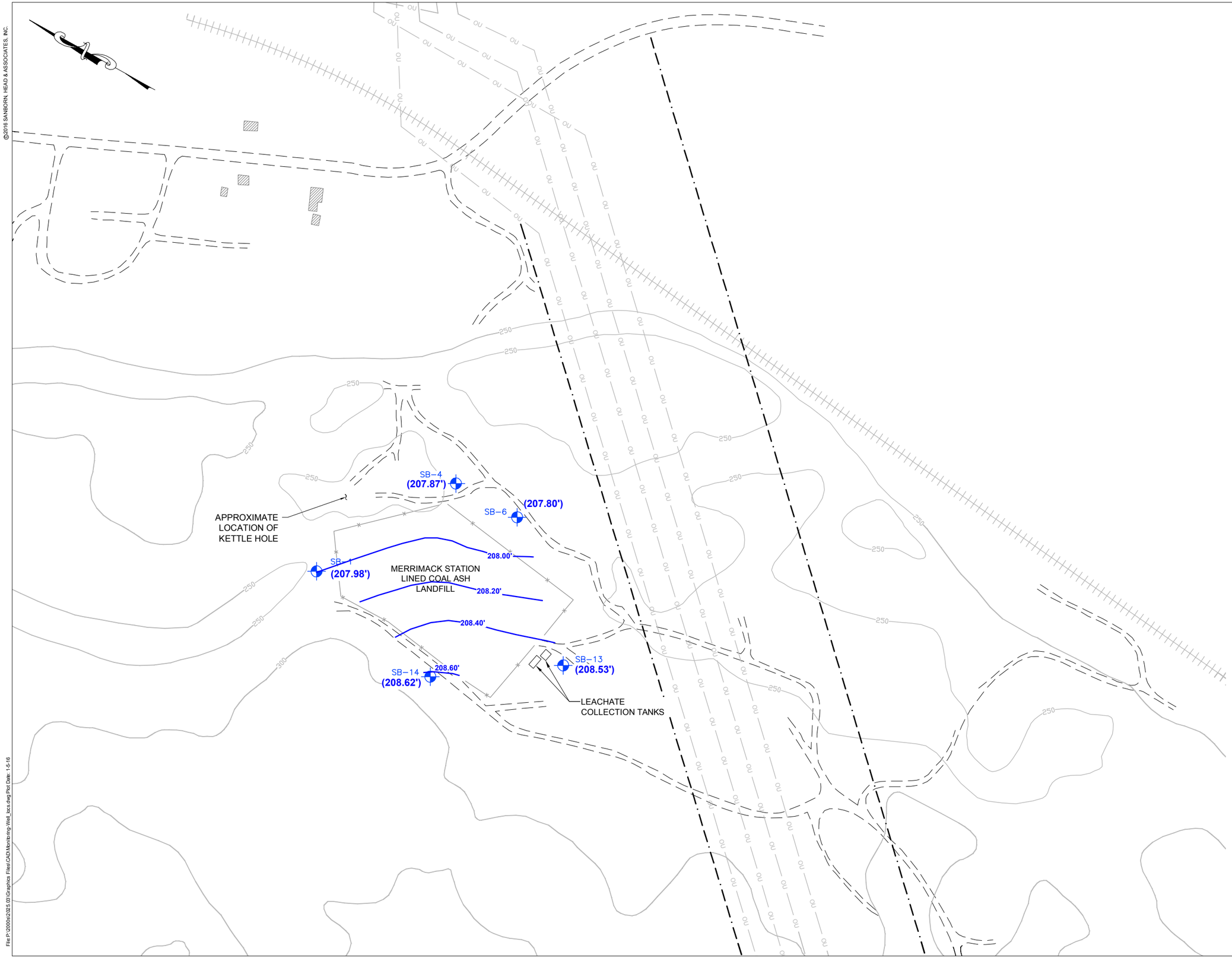


Figure 1.D

November 2017 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 17, 2017.

Legend

- SB-4 — Monitoring Well
- (207.98') — Groundwater Elevation Measured on Nov. 17, 2017
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.20' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

Figure 1.E

April 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on April 9, 2018.

Legend

- SB-4 — Monitoring Well
- (207.98') — Groundwater Elevation Measured on April 9, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.20' — Groundwater Contour (dashed where less constrained)

SB-4 (209.68')
SB-6 (209.84')
SB-1 (209.72')
SB-13 (211.12')
SB-14 (210.76')
APPROXIMATE LOCATION OF KETTLE HOLE
MERRIMACK STATION LINED COAL ASH LANDFILL
LEACHATE COLLECTION TANKS
210.00'
210.50'
211.00'

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

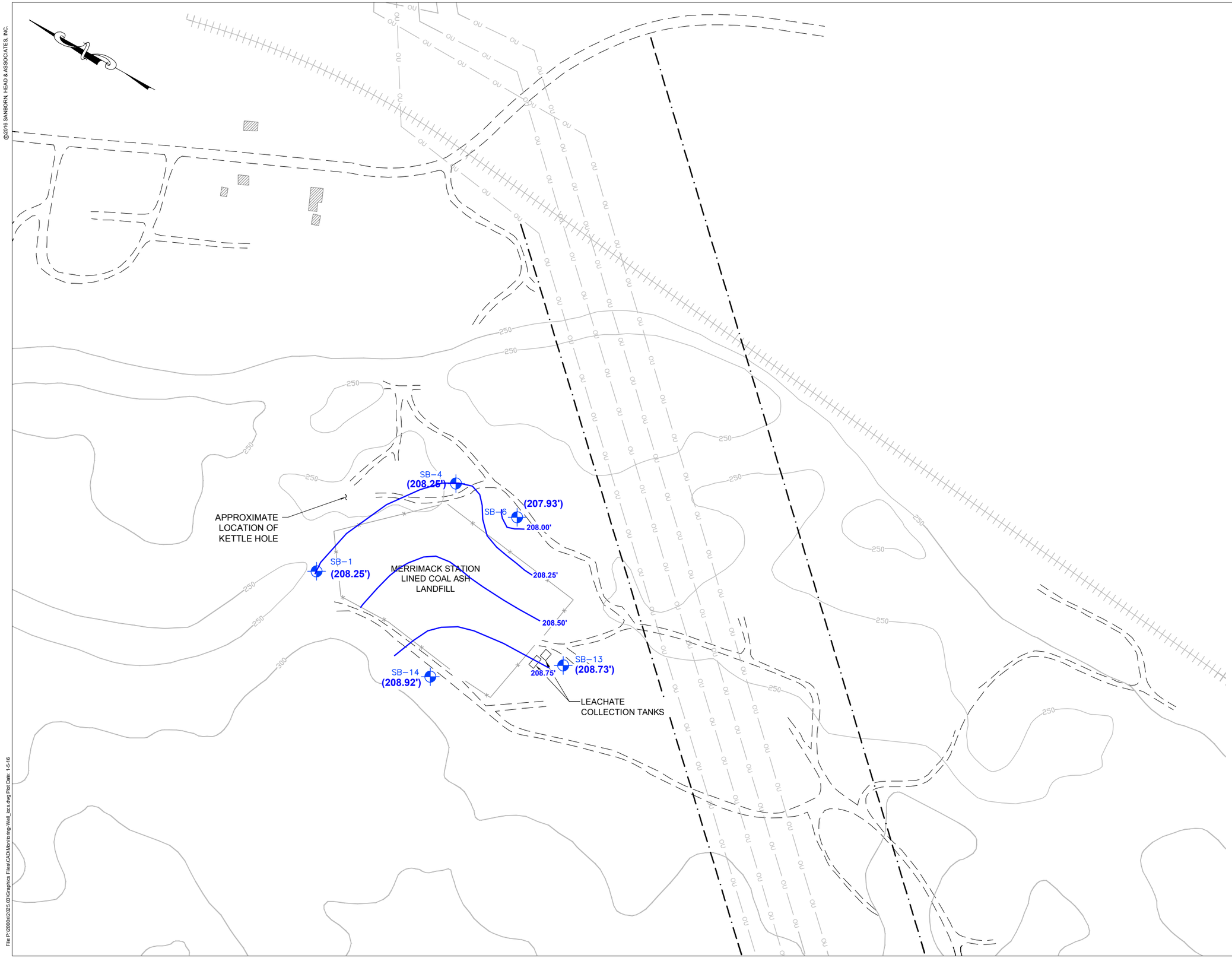


Figure 1.F

July 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: October 2018

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on July 25, 2018.

Legend

- SB-4 — Monitoring Well
- (207.93') — Groundwater Elevation Measured on July 25, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.25' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

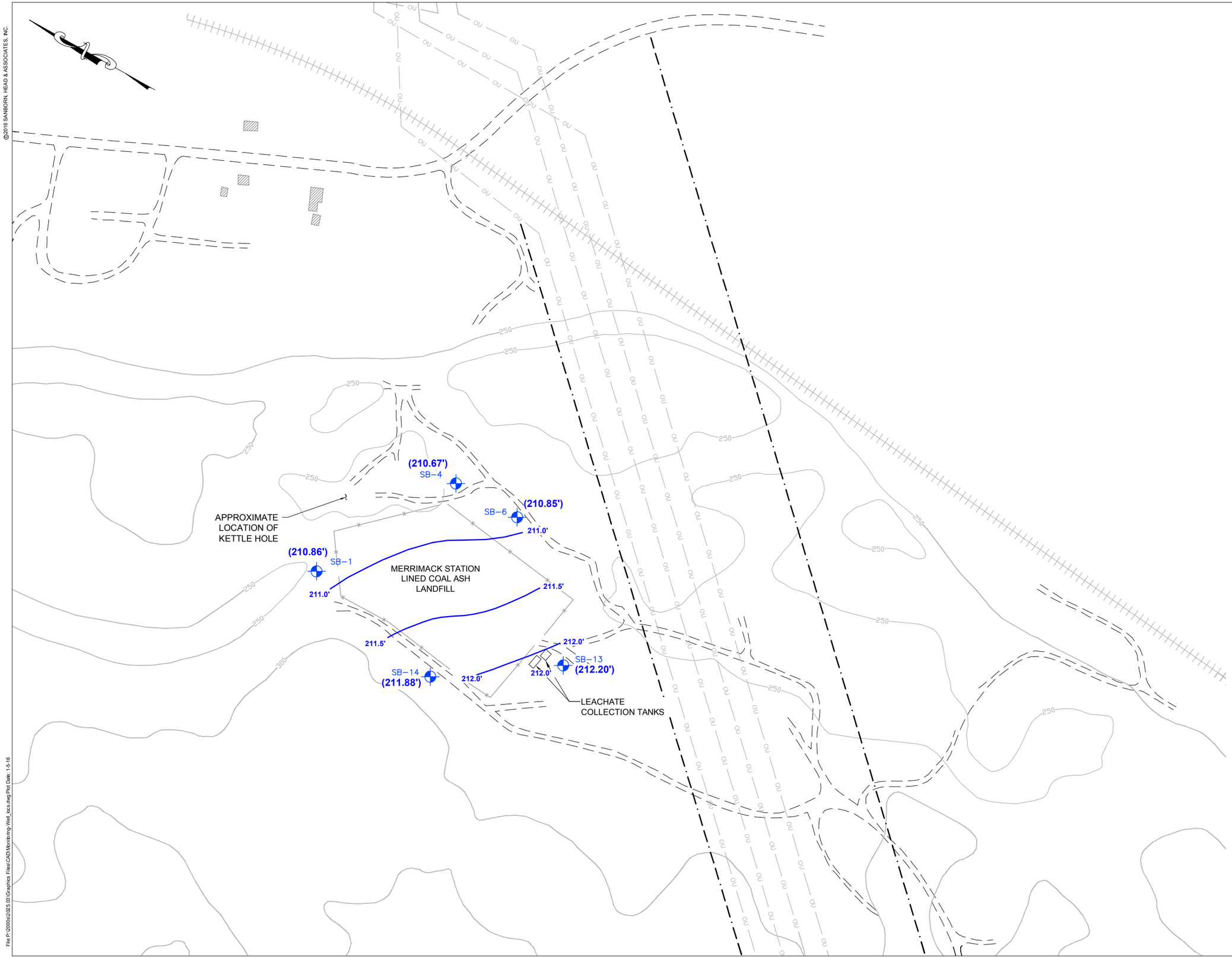


Figure 1.G

November 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: L. Damiano
Project No: 2025.07
Date: March 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 28, 2018.

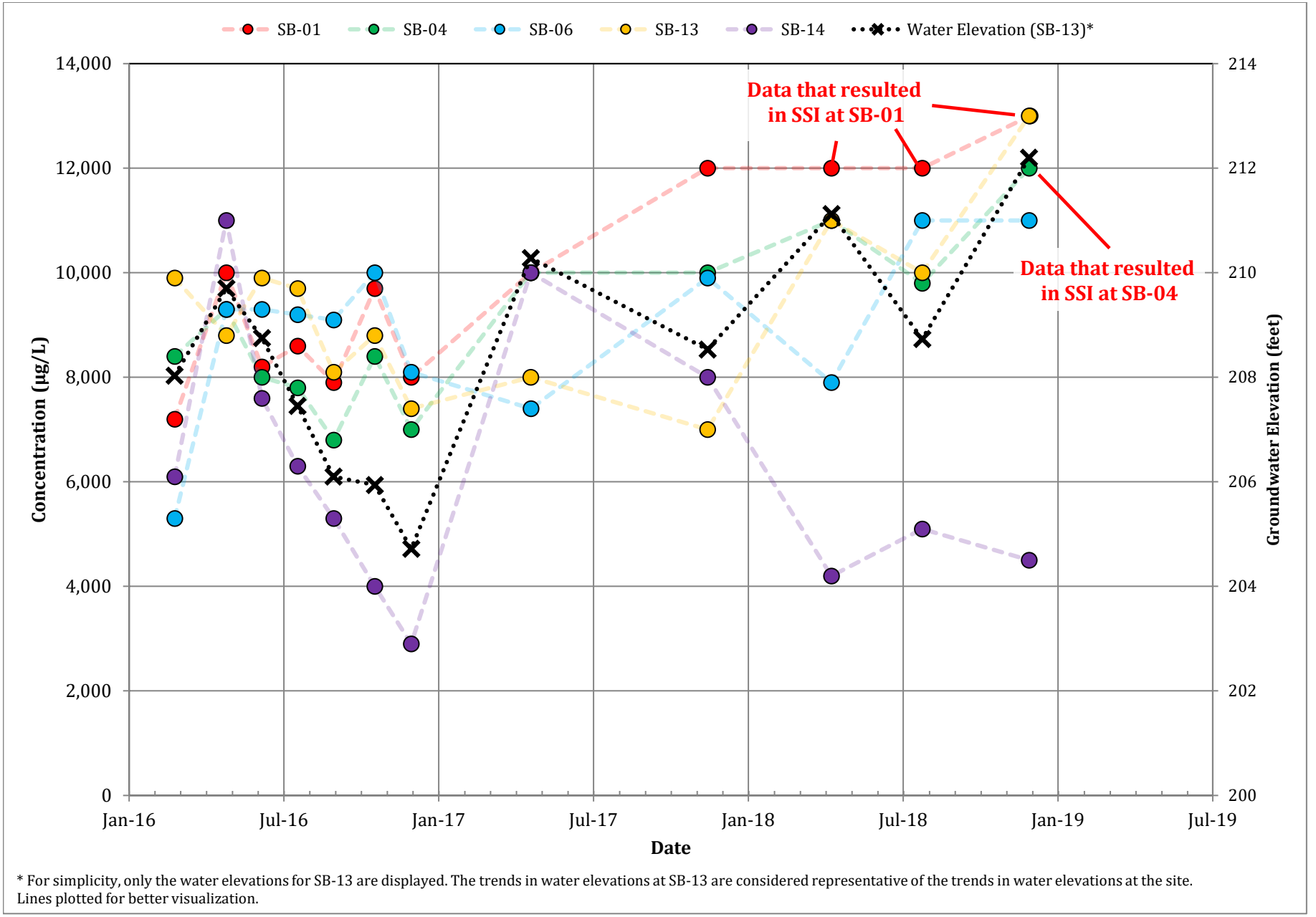
Legend

- SB-4 — Monitoring Well
- (212.20') — Groundwater Elevation Measured on Nov. 28, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 212.0' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

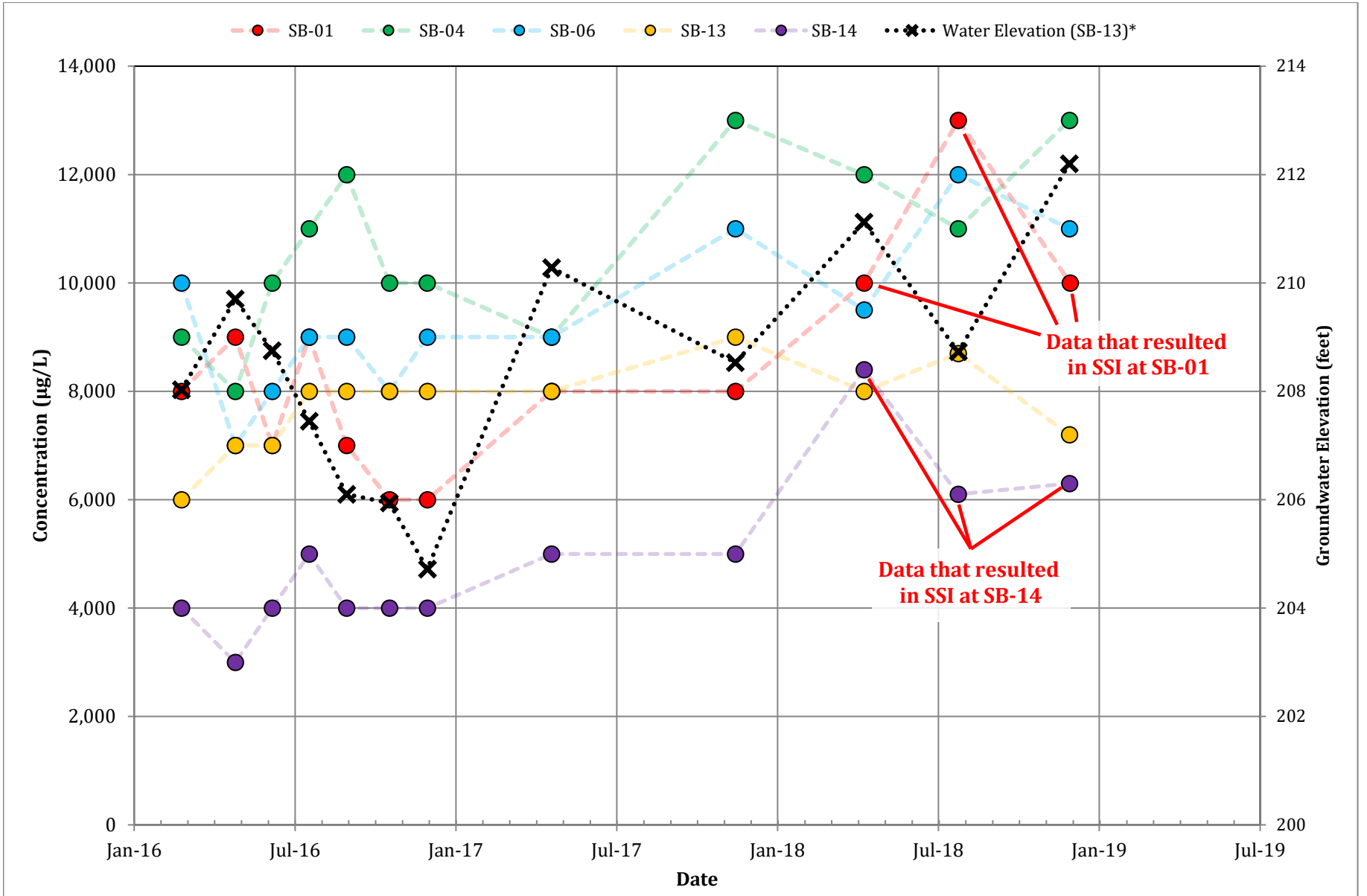
SANBORN HEAD

Figure 2A - Calcium Timeseries
Merrimack Station Coal Ash Landfill
Bow, New Hampshire



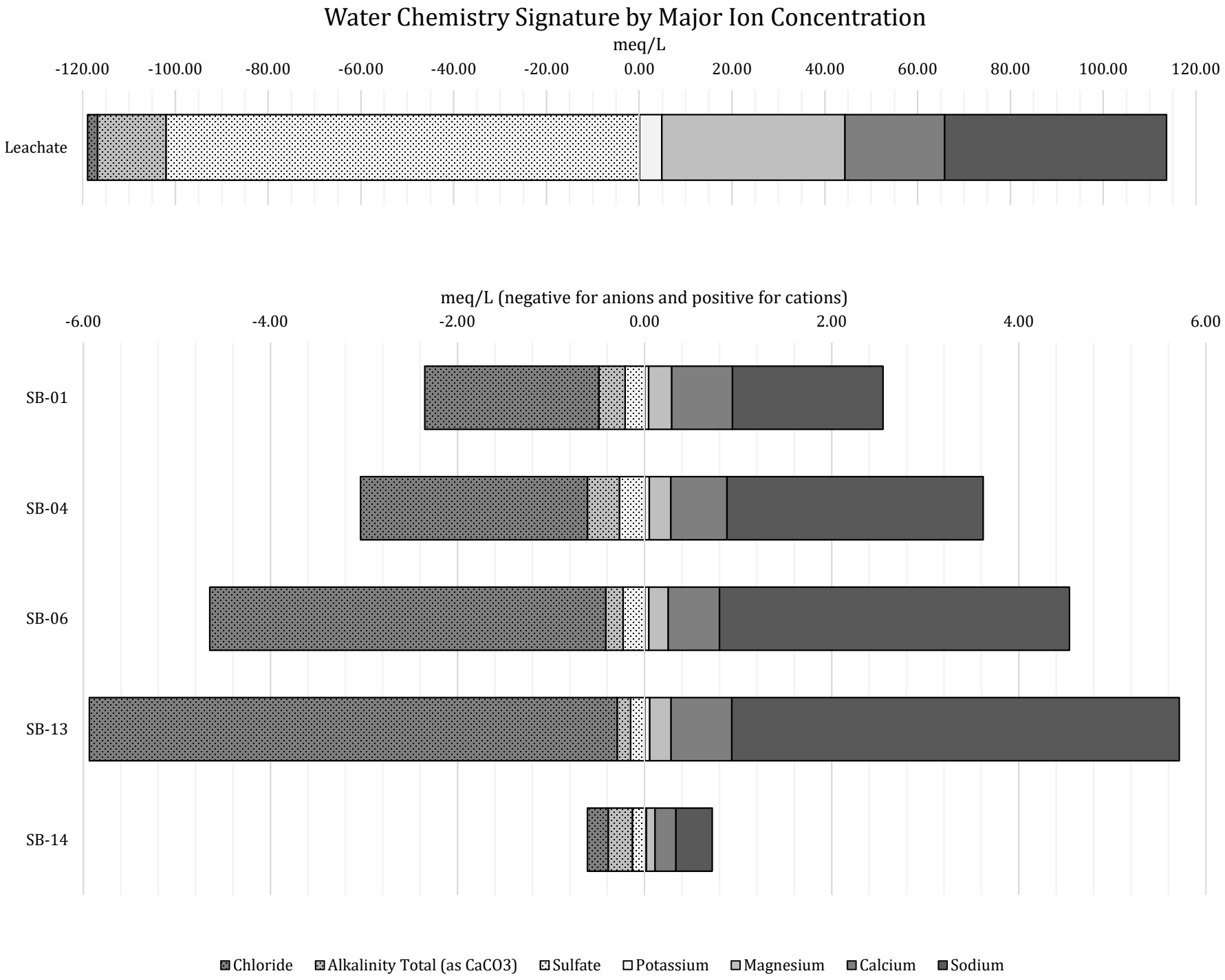
* For simplicity, only the water elevations for SB-13 are displayed. The trends in water elevations at SB-13 are considered representative of the trends in water elevations at the site. Lines plotted for better visualization.

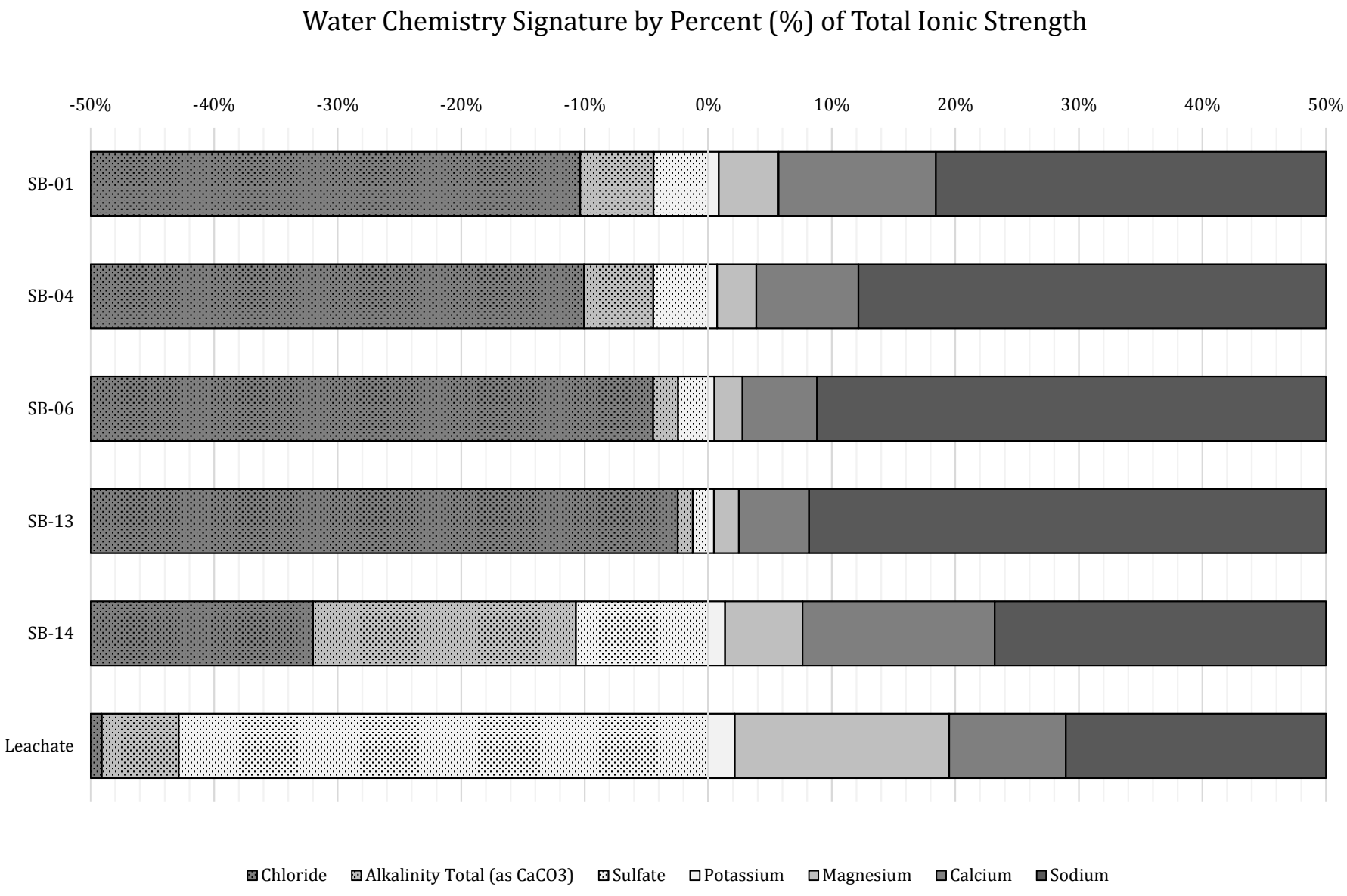
Figure 2B - Sulfate Timeseries
Merrimack Station Coal Ash Landfill
Bow, New Hampshire



* For simplicity, only the water elevations for SB-13 are displayed. The trends in water elevations at SB-13 are considered representative of the trends in water elevations at the site. Lines plotted for better visualization.

Figure 3 - Water Chemistry Signatures
Merrimack Station Coal Ash Landfill
Bow, New Hampshire





ATTACHMENT 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 at 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 locations at times and under conditions stated within the report. Note that 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. It must be noted that additional compounds not searched for during the current study may be present in groundwater at the site. Sanborn Head relied upon the data provided by the analytical laboratory and did not conduct an independent evaluation of the reliability of these data. Moreover, it should be noted that variations in the types and concentrations of contaminants 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 were 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 rely 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 may be modified accordingly.

5. This report was prepared for the exclusive use of GSP Merrimack LLC for specific application for groundwater quality monitoring for the Merrimack Station Coal Ash Landfill site located in Bow, New Hampshire and has been prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

ATTACHMENT B
QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I certify that the information in this alternative source demonstration (ASD) report, dated May 28, 2019 (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.

ERIC S STEINHAUSER

Printed Name of Licensed Professional Engineer

Signature

11494	NH	1/7/2020
License Number	Licensing State	Date

October 2019

SANBORN HEAD

SANBORN HEAD

Building Trust. Engineering Success.

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

October 22, 2019
File No. 2025.08

Re: Alternative Source Demonstration
Data Collected April and July 2019
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.

INTRODUCTION

Based on the prediction interval procedure performed by Sanborn Head, a statistically significant increase (SSI) compared to background was identified at monitoring well SB-6 for sulfate.[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.

Using a weight-of-evidence approach, we conclude that the SSI is due to natural variation in groundwater chemistry and limitations of the original statistical analysis based on the following findings.

- Detected concentrations of sulfate are within the range of naturally occurring concentrations and within range of concentrations historically detected at SB-6.
- Significantly increasing trends in background sulfate concentrations were observed at four site monitoring wells, including SB-6 and the site upgradient well SB-13. After prediction limits are adjusted for the trend in background data, the April and July 2019 data do not indicate a statistically significant increase.

[1] The April 2019 laboratory analytical data were received on May 10, 2019. Confirmatory sampling, which is allowed with the "1-of-2" retesting strategy, was completed in July 2019, and the data were received on July 25, 2019. The statistical analyses are summarized in the Statistical Method Selection Certification, dated May 4, 2018.

- Groundwater flow conditions and groundwater chemistry naturally vary over time at the site. The variation in groundwater chemistry data that resulted in the SSI of sulfate at SB-6 is consistent with the natural variation in groundwater chemistry observed at the site.

Groundwater analytical data are provided in Table 1 and monitoring well locations are depicted in Figures 1.A through 1.H.

NATURALLY OCCURING CONCENTRATIONS

The concentrations of sulfate associated with the SSI are within the range of naturally occurring concentrations for comparable groundwaters, as reported in local, state-wide, regional studies, and historical data at SB-6 summarized in Exhibit 1, below.[2,3,4,5] The local 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.

Exhibit 1: Comparison of Site Sulfate Concentrations to Literature Values

Study/Location	**Sulfate (µg/L)**	
Local Stratified Drift Aquifers [sample size (n)=16]	Min.: Median: Max.:	1,000 7,500 14,000
New Hampshire Stratified Drift Aquifers [n=255]	Min.: Median: Max.:	<100 7,800 79,000
Northeast Crystalline Rock Aquifers [n=117]	Min.: Median: Max.:	310 13,420 68,480
SB-6 Historical Data April 1996 through November 2015 [n= 39]	Min: Median: 95th Percentile: Max:	<1,000 10,000 17,000 26,000
SB-6 (SSI data in **bold**)	April 2019: July 2019:	**14,000** **15,000**

Sulfate occurs naturally in groundwater in the region through dissolution of sulfate-producing minerals (e.g., sulfide minerals). The sulfate data that resulted in the SSI at SB-6 were near the maximum value detected in the small local study and were well within the range of sulfate concentrations reported in the state and regional studies. Further, the concentrations were less than the 95th-percentile of the historical data for SB-6. The

[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*.

[5] *April 2019 Data Transmittal, Detection Permit, Merrimack Station Coal Ash Landfill*. Prepared by Sanborn Head for GSP Merrimack LLC. Submitted to the New Hampshire Department of Environmental Services on June 4, 2019, per Groundwater Release Detection Permit GWP-198400065-B-006.

historical data for SB-6 were collected under a different regulatory program using different sampling methods than those used for the CCR Rules, but the data still provide a helpful reference for background sulfate concentrations at SB-6.

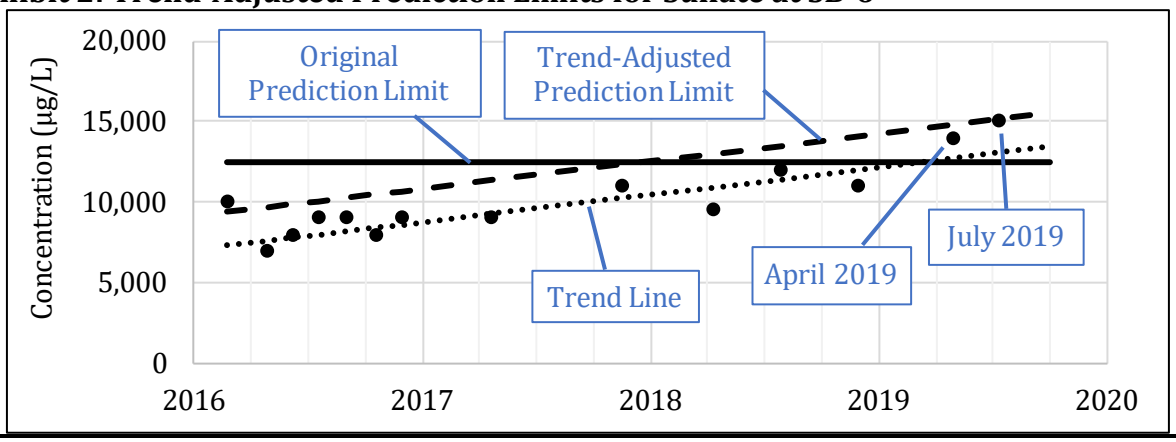
In addition to sulfate concentrations being within the range of historical concentrations and concentrations in comparable groundwaters, the sulfate concentrations were much less than the New Hampshire Ambient Groundwater Quality Standard (AGQS) for sulfate of 500,000 µg/L. The AGQSs are intended to be protective of groundwater as a source of drinking water.

SIGNIFICANT TRENDS IN BACKGROUND

For background data collected in February 2016 through November 2018, significantly increasing trends in sulfate concentrations were detected at SB-4, SB-6, SB-13, and SB-14.[6] The overall trends in sulfate concentrations are shown in Figure 2, and trend analyses for the background data at each well are provided as Attachment C. Because the increasing trend in sulfate concentrations is evident in the two wells upgradient of SB-6 (i.e., SB-13 and SB-14), the increasing sulfate concentrations observed in SB-6 are inferred to be unrelated to the CCR landfill.

The USEPA Unified Guidance describes methods for correcting for linear trends in data.[7] The methodology includes calculation of a linear trend and using the residual concentrations. For calculating trend-adjusted prediction limits, the prediction limit calculation was performed on the residuals and then adjusted for the April and July 2019 sampling dates using the linear trend. As illustrated in Exhibit 2, the trend-adjusted prediction limits depend on the sampling date because the limit has a slope that matches the slope of the trend line.

Exhibit 2: Trend-Adjusted Prediction Limits for Sulfate at SB-6



SB-6 Sulfate Concentrations (µg/L)				
Original Prediction Limit	April 2019		July 2019	
	Detected Concentration	Trend-Adjusted Prediction Limit	Detected Concentration	Trend-Adjusted Prediction Limit
12,521	14,000	14,814	15,000	15,170

[6] Increasing trends were tested using ProUCL 5.1 software for Mann-Kendall analysis at a significance of 0.05. Documentation is provided as Attachment C.

[7] USEPA Unified Guidance Document for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, dated March 2009 (USEPA Unified Guidance).

A comparison of the April and July 2019 sulfate data to the original prediction limit for sulfate at SB-6 indicated an SSI. However, neither the April 2019 nor the July 2019 concentrations exceeded their respective, trend-adjusted prediction limits, demonstrating that there was no SSI using this updated statistical method. This is strong evidence that the sulfate concentrations at SB-6 should not be considered an SSI because, by using the statistical analysis that accounts for the apparent natural variation and increasing trend in background, the SSI is no longer detected.

NATURAL VARIATION DUE TO GROUNDWATER FLOW

Groundwater flow conditions (i.e., groundwater flow direction, flow rate, and elevations) at the site vary over time. The overall flow direction at the site is predominantly to the northeast with a shallow hydraulic gradient (i.e., on the order of 0.001 feet per foot [ft/ft]), although flow direction can change to either more northerly (i.e., north-northeast) or more easterly (i.e., east). Tabulated flow conditions for each monitoring event are provided as Table 2, and groundwater contour maps representative of the varying flow were prepared for June 2016, November 2016, April 2017, November 2017, April 2018, July 2018, November 2018, and April 2019 (provided as Figures 1.A through 1.H, respectively). These tabulated values and groundwater contour maps demonstrate the variability in groundwater flow conditions observed at the site.

Trends in groundwater elevations and trends in groundwater chemistry (e.g., concentrations of sulfate) are correlated, as discussed in detail in previous ASDs completed for sulfate and calcium at other site monitoring wells. The timeseries plot of groundwater elevations and sulfate concentrations, included as Figure 2, relates variation in groundwater elevations and sulfate concentrations over time. The fluctuations are not indicative of impacts from the CCR unit because both upgradient and downgradient monitoring wells show temporal changes in groundwater chemistry, with more consistent and lower sulfate concentrations during the first eight samples followed by increased variability and increased concentrations in subsequent sampling rounds (i.e., since November 2017). These fluctuations are likely associated with natural sources of groundwater chemistry variation, like mineralogical composition of the upgradient aquifer material, groundwater age, or precipitation and infiltrate characteristics.

In addition to natural sources of groundwater chemistry fluctuation that may be associated with changes in groundwater flow conditions, anthropogenic activities in the area are another potential source of variation in the groundwater chemistry at the site. One potential source is the ongoing sand and gravel mining occurring upgradient and cross-gradient of the site. Mining activities in the area include approximately 30 acres of non-vegetated area and a drainage feature recently installed directly upgradient/cross-gradient of SB-1 (aerial photographs indicate the apparent vegetated swale was installed between April 2016 and September 2017).

CLOSING

Detected concentrations of sulfate are within the naturally occurring range and the range of concentrations detected previously at SB-6. A comparison to trend-adjusted prediction limits indicates that the SSI of sulfate at SB-6 is an artifact of increasing trends in background groundwater. Furthermore, the SSI of sulfate at SB-6 is consistent with natural variation in groundwater flow conditions and general groundwater chemistry at the site.

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 SSI of sulfate at SB-6 is due to natural variation in groundwater chemistry and limitations of the original statistical analysis.

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, P.E.
Project Manager

Eric S. Steinhauser, P.E., CPESC, CPSWQ
Senior Vice President

HRR/AEA/ESS:ndl/hrr

Enclosures: Table 1 – Groundwater Analytical Results Summary
Table 2 – Groundwater Level Measurements Summary
Table 3 – SB-6 Historical Groundwater Analytical Results
Figures 1.A through 1.H – Groundwater Contours
(June 2016 through April 2019)
Figure 2 – Sulfate Timeseries
Attachment A – Qualified Professional Engineer Certification
Attachment B – Limitations
Attachment C – Trend Analyses

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TABLES

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

Location	Date	Metals																						
		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
GW-1/(AGQS)		6 ‡	10 ‡	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	5.2	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	5.7	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	5.5	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	5.4	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	5.2	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	5.6	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	5.6	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	5.8	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	5.7			
	1/31/2018 ¢							12,000																
	4/9/2018					67		12,000									55,000	<100	10,000	160,000	5.9			
	7/25/2018 ¢							12,000									63,000		13,000	140,000	5.9			
	11/29/2018					87		13,000									66,000	<100	10,000	100,000	6.1			
	4/26/2019					100		13,000									55,000	<100	12,000	140,000	5.8			
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	5.5	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	5.3	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	5.6	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	5.3	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	5.7	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	5.7	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	5.8	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	5.7	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	5.8			
	4/9/2018					<50		11,000									93,000	<100	12,000	220,000	5.9			
	7/25/2018 ¢							9,800									95,000		11,000	210,000	5.7			
	11/28/2018					<50		12,000									86,000	<100	13,000	83,000	6.3			
	4/26/2019					<50		13,000									94,000	<100	11,000	190,000	5.8			
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	5.6	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	5.6	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	5.4	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	5.3	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	5.7	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	5.8	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	5.8	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	5.7	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	5.6			
	4/9/2018					<50		7,900									120,000	<100	9,500	240,000	5.6			
	7/25/2018 ¢							11,000									180,000		12,000	310,000	5.4			
	11/28/2018					<50		11,000									150,000	<100	11,000	140,000	5.9			
	4/26/2019					84		13,000									150,000	<100	14,000	210,000	5.8			
	7/11/2019					80		14,000									170,000		15,000	330,000	5.8			

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

Location	Date	Metals																						
		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
GW-1/(AGQS)		6 ‡	10 ‡	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-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	5.3	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	5.5	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	5.5	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	5.3	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	5.4	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	5.1	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	5.7	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	5.6	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	5.8			
	4/9/2018					<50		11,000									170,000	<100	8,000	330,000	5.8			
	7/25/2018 ¢							10,000									190,000		8,700	340,000	5.7			
	11/28/2018					<50		13,000									200,000	<100	7,200	260,000	5.8			
	4/26/2019					<50		14,000									200,000	<100	7,100	290,000	5.5			
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	5.1	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	5.6	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	5.4	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	5.3	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	5.8	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	5.6	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	5.2	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	5.6	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	5.6			
	4/9/2018					<50		4,200									14,000	<100	8,400	80,000	5.8			
	7/25/2018 ¢							5,100									9,800		6,100	56,000	5.6			
	11/28/2018					<50		4,500									7,800	<100	6,300	<5,000	6.0			
	4/26/2019					<50		8,700									19,000	<100	3,700	91,000	5.7			

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 and September 2018 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.

6. "†" indicates the RCMP lists as not currently available.
"‡" indicates the value provided is the corresponding "dissolved metal" NHDES standard for reference only; NHDES standards for total metals are listed in the RCMP.
"NA" indicates the RCMP lists as not applicable.
"NS" indicates the analyte is not listed in the RCMP or MCL list.
"¢" indicates sample rounds collected as part of the resampling program for identifying statistically significant increases (SSIs).

TABLE 2
Summary of Groundwater Level Measurements
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

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.

TABLE 3
SB-6 Historical Groundwater Analytical Results
Merrimack Station Coal Ash Landfill
Bow, New Hampshire

Sample Date	Water Elevation (feet)	pH (s.u.)	Specific Conductance (µS)	Anions (mg/l)	Metals (mg/l)											
				Sulfate	Antimony	Arsenic	Barium	Cadmium	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver
AGQS	**NS**	**NS**	**NS**	**500**	**0.006**	**0.01**	**2**	**0.005**	**0.1**	**NS**	**0.015**	**0.84**	**0.002**	**0.1**	**0.05**	**0.1**
Apr-96		5.6	260	8						0.1		0.013				
Oct-96		5.6	230	<1				<0.001		0.19		0.009		<0.01		
Apr-97		5.6	260	7						0.05		0.008				
Nov-97		5.2	200	9				<0.001		0.07		0.005		<0.01		
Apr-98		5.2	230	17						0.16		0.010				
Nov-98		6.6	42	26				<0.001		0.04		0.008		<0.01		
Apr-99		5.8	190	10						0.16		0.011				
Nov-99		5.7	230	10				<0.001		0.14		0.009		<0.01		
Apr-00		5.8	290	8						82*		**2.0***				
Nov-00		5.7	250	10				<0.001		0.01		0.006		<0.01		
Apr-01		5.8	260	10						0.22		0.012				
Nov-01		5.7	250	12				<0.001	<0.002	0.05		0.006		<0.01	<0.05	
Apr-02		5.5	180	12						0.02		0.006				
Nov-02		5.6	290	8				<0.001	<0.001	0.09		0.009		<0.001	<0.001	
Apr-03		5.5	290	9						<0.05		0.009				
Nov-03		5.6	310	9				<0.001	<0.002	0.13		0.012		<0.01	<0.05	
Apr-04		5.6	450	12						<0.05		0.014				
Nov-04		5.4	280	18				<0.001	<0.002	<0.05		0.011		<0.01	<0.05	
Apr-05		5.6	440	10						<0.05		0.019				
Nov-05		5.8	290	14				<0.001	<0.001	<0.05		0.010		<0.001	<0.001	
Apr-06		5.3	350	14						<0.05		0.017				
Nov-06		5.7	180	12				<0.001	<0.001	<0.05		0.009		<0.001	<0.001	
Apr-07		5.7	250	10						<0.05		0.017				
Nov-07		5.6	230	12	<0.001	<0.001	0.007	<0.001	<0.001	<0.05	<0.001	0.014	<0.0001	<0.001	<0.001	<0.001
Apr-08	213.36	5.8	340	11						0.12		0.020				
Nov-08	209.57	6.1	250	9						<0.05		0.012				
Apr-09	211.23	5.7	320	11						0.06		0.018				
Nov-09	208.68	5.6	250	11	<0.001	<0.001	0.006	<0.001	<0.001	<0.05	<0.001	0.010	<0.0001	<0.001	<0.001	<0.001
Apr-10	212.16	5.5	360	9						<0.05		0.019				
Nov-10		5.8	190	14						<0.05		0.007				
Apr-11	210.17	5.3	300	8						<0.05		0.017				
Nov-11	210.03	5.4	300	11						0.18		0.011				
Apr-12	209.69	5.7	370	13						<0.05		0.014				
Nov-12	206.27	5.9	330	12	<0.001	0.002	0.008	<0.001	<0.001	0.25	<0.001	0.015	<0.0001	<0.001	<0.005	<0.001
Apr-13	208.81	5.7	350	7						<0.05		0.016				
Nov-13	206.86	5.8	420	9						<0.05		0.015				
Apr-14	210.03	6.1	460	8						<0.05		0.019				
Nov-14	206.01	5.7	470	10	<0.001	<0.001	0.014	<0.001	<0.001	<0.05	<0.001	0.014	<0.0001	<0.001	<0.001	<0.001
Apr-15	209.45	5.8	430	9						<0.05		0.017				
Nov-15	205.41	5.8	480	10						<0.05		0.015				

Notes:

1. Data provided to Sanborn Head by GSP Merrimack LLC (prior to 2015) and EAI (2015 through present).

2. Concentrations are presented in milligrams per liter (mg/l), which are equivalent to parts per million (ppm), with the exception of pH, which is reported in standard units (s.u.), and specific conductance, which is reported in microSiemens (µS).

3. "AGQS" indicates Ambient Groundwater Quality Standards (AGQS) promulgated in Env-Or 600 (June 2015 with October 2016 and September 2018 amendments).

4. "NS" indicates there is not an AGQS for the monitoring parameter.
"<" indicates the analyte was not detected above the indicated laboratory reporting limit.
A blank indicates the sample was not analyzed for this parameter.

5. **Bold** values exceed the AGQS.

6. "*" indicates that a supplemental sample was collected on 7/6/00 and yielded the following results: Iron = 0.08 mg/l & Manganese = 0.010 mg/l.

FIGURES

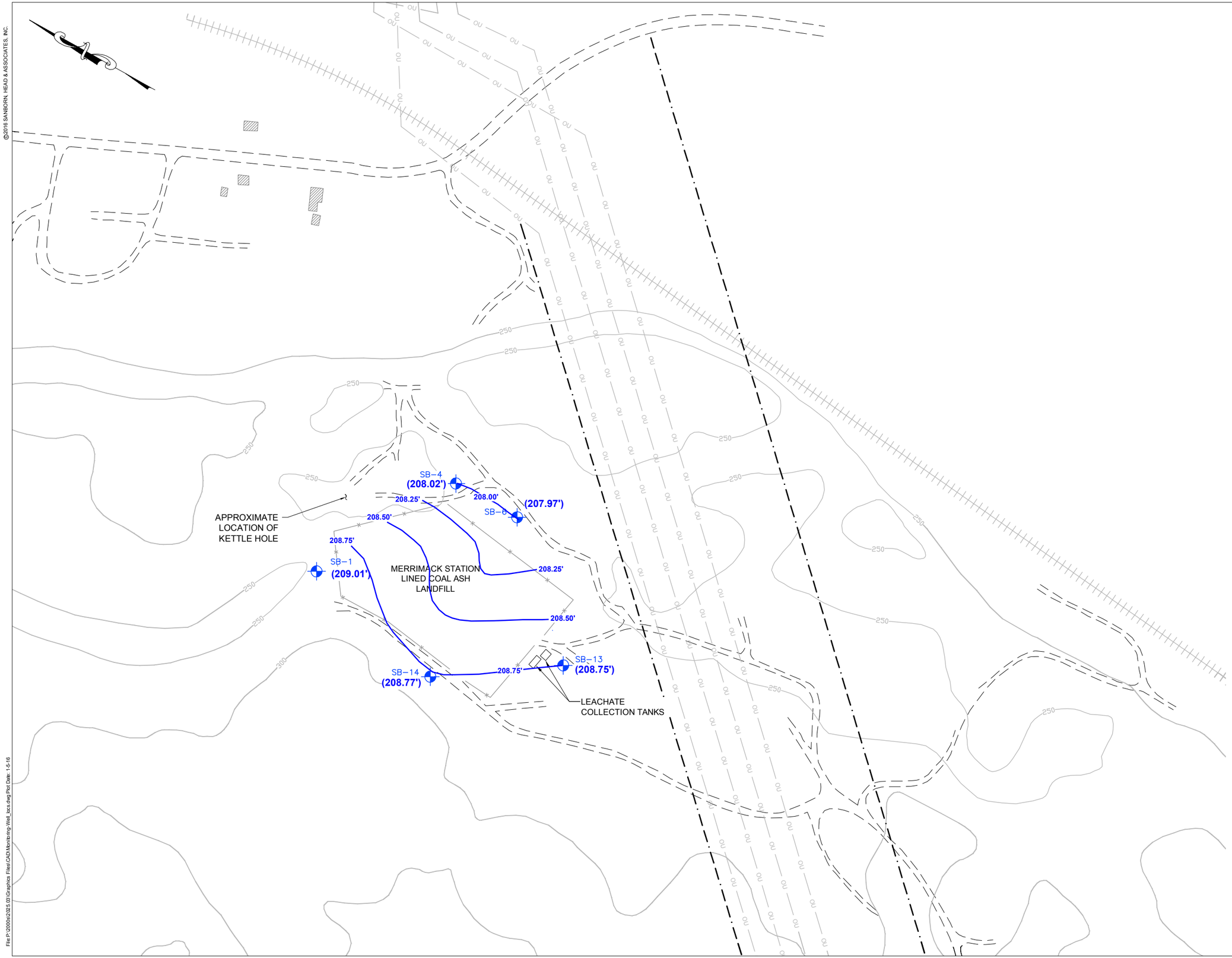


Figure 1.A

June 2016 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: A. Ashton
Project No: 2025.08
Date: August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on June 6, 2016.

Legend

- SB–4 — Monitoring Well
- (209.01') — Groundwater Elevation Measured on June 6, 2016
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.50' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitring Well_locs.dwg Plot Date: 1-5-16

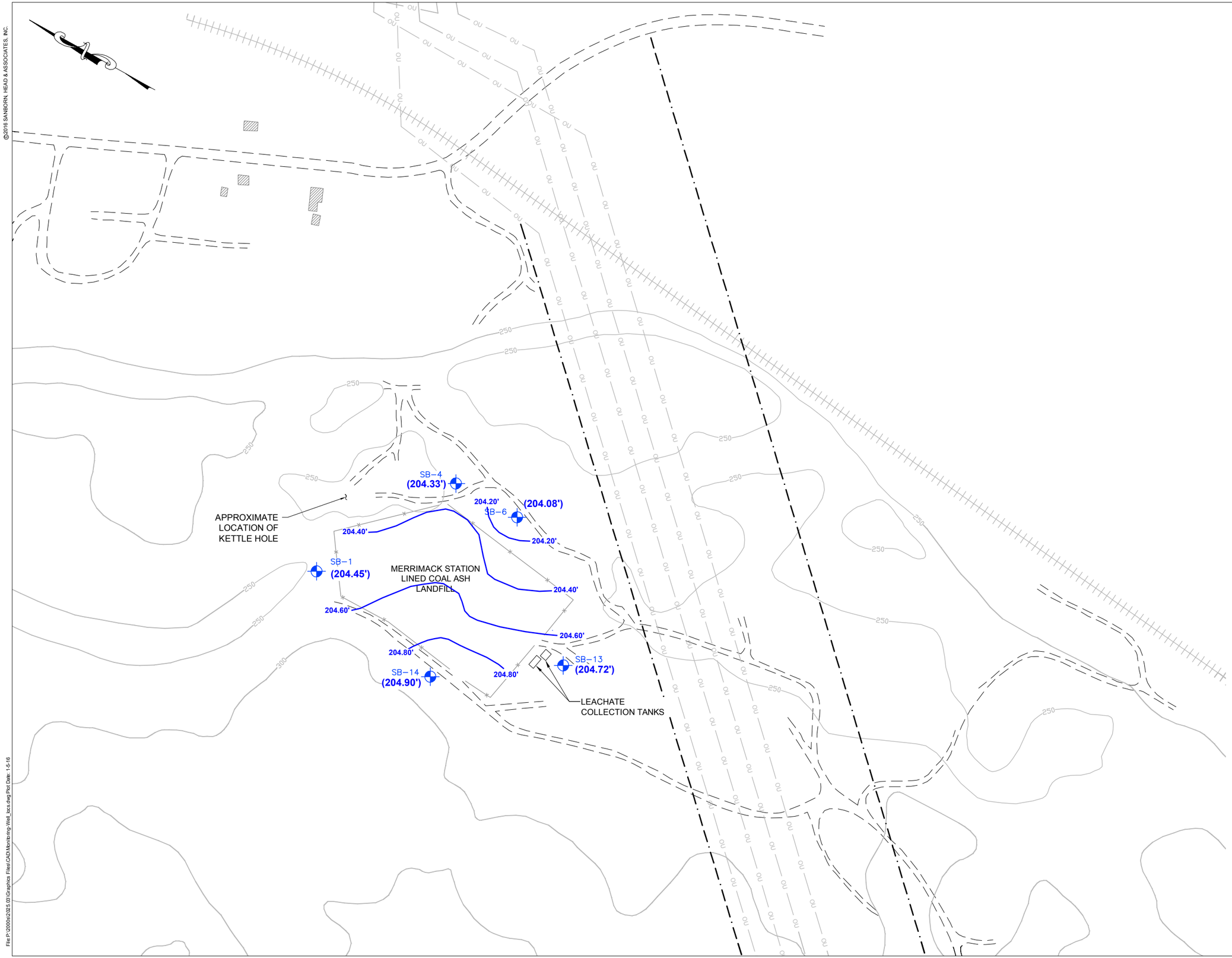


Figure 1.B

November 2016 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: A. Ashton
Project No: 2025.08
Date: August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 29, 2016.

Legend

- SB–4 — Monitoring Well
- (204.45') — Groundwater Elevation Measured on Nov. 29, 2016
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 204.60' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitring Well_locs.dwg Plot Date: 1-5-16

SB–4
(208.44')
208.50'
208.50'
SB–6
(208.73')
APPROXIMATE
LOCATION OF
KETTLE HOLE
209.00'
SB–1
(208.58')
MERRIMACK STATION
LINED COAL ASH
LANDFILL
209.50'
209.00'
210.00'
209.50'
SB–13
(210.28')
SB–14
(209.71')
210.00'
LEACHATE
COLLECTION TANKS

250
300
OU

Figure 1.C

April 2017 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: A. Ashton
Project No: 2025.08
Date: August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on April 19, 2017.

Legend

- SB–4 — Monitoring Well
- (208.58') — Groundwater Elevation Measured on April 19, 2017
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 209.50' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

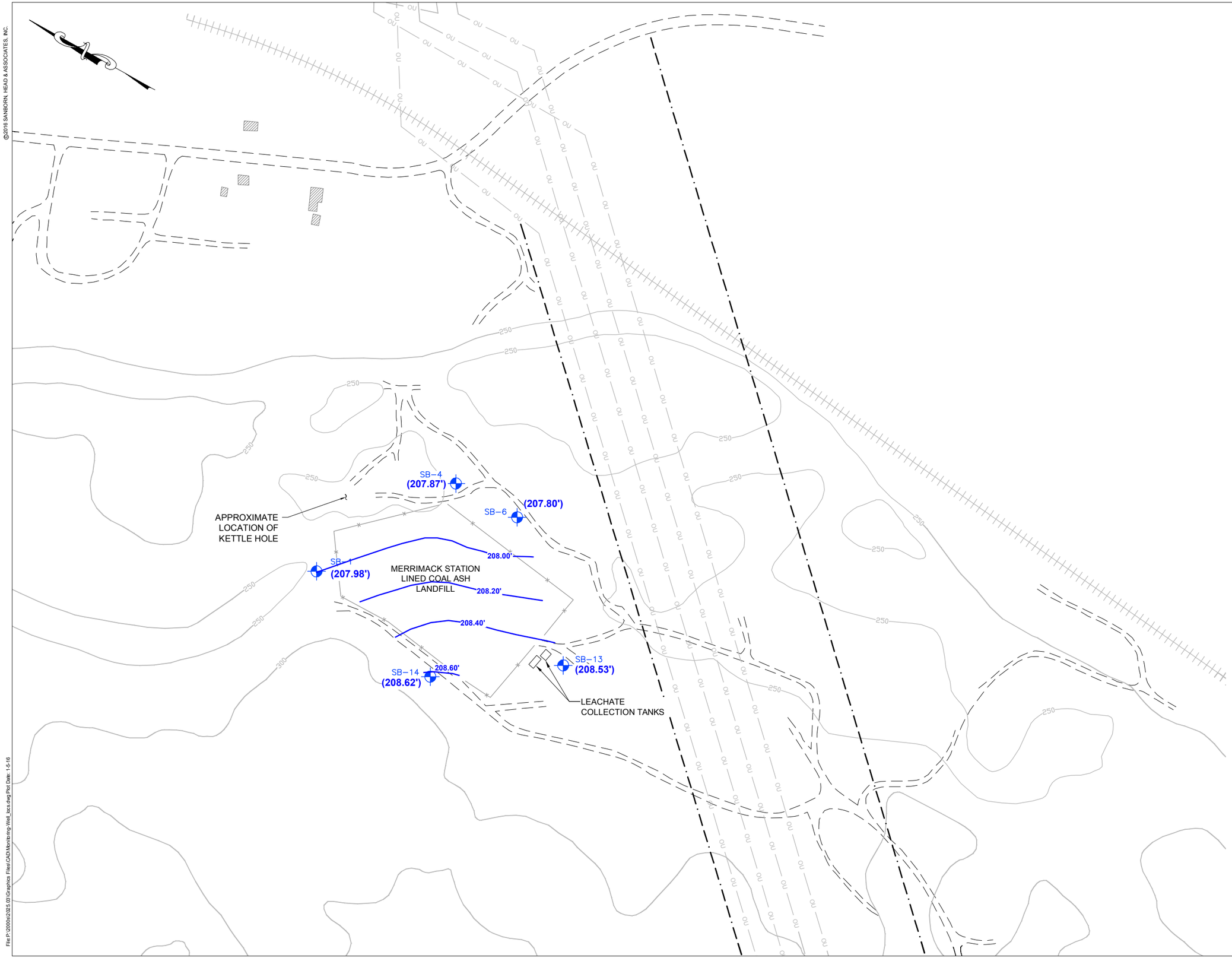


Figure 1.D

November 2017 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: A. Ashton
Project No: 2025.08
Date: August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 17, 2017.

Legend

- SB-4 — Monitoring Well
- (207.98') — Groundwater Elevation Measured on Nov. 17, 2017
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.20' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

Figure 1.E

April 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By: L. Teal
Designed By: H. Roakes
Reviewed By: A. Ashton
Project No: 2025.08
Date: August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on April 9, 2018.

Legend

- SB-4 — Monitoring Well
- (207.98') — Groundwater Elevation Measured on April 9, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.20' — Groundwater Contour (dashed where less constrained)

SB-4 (209.68')
SB-6 (209.84')
SB-1 (209.72')
SB-13 (211.12')
SB-14 (210.76')
APPROXIMATE LOCATION OF KETTLE HOLE
MERRIMACK STATION LINED COAL ASH LANDFILL
LEACHATE COLLECTION TANKS
210.00'
210.50'
211.00'

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

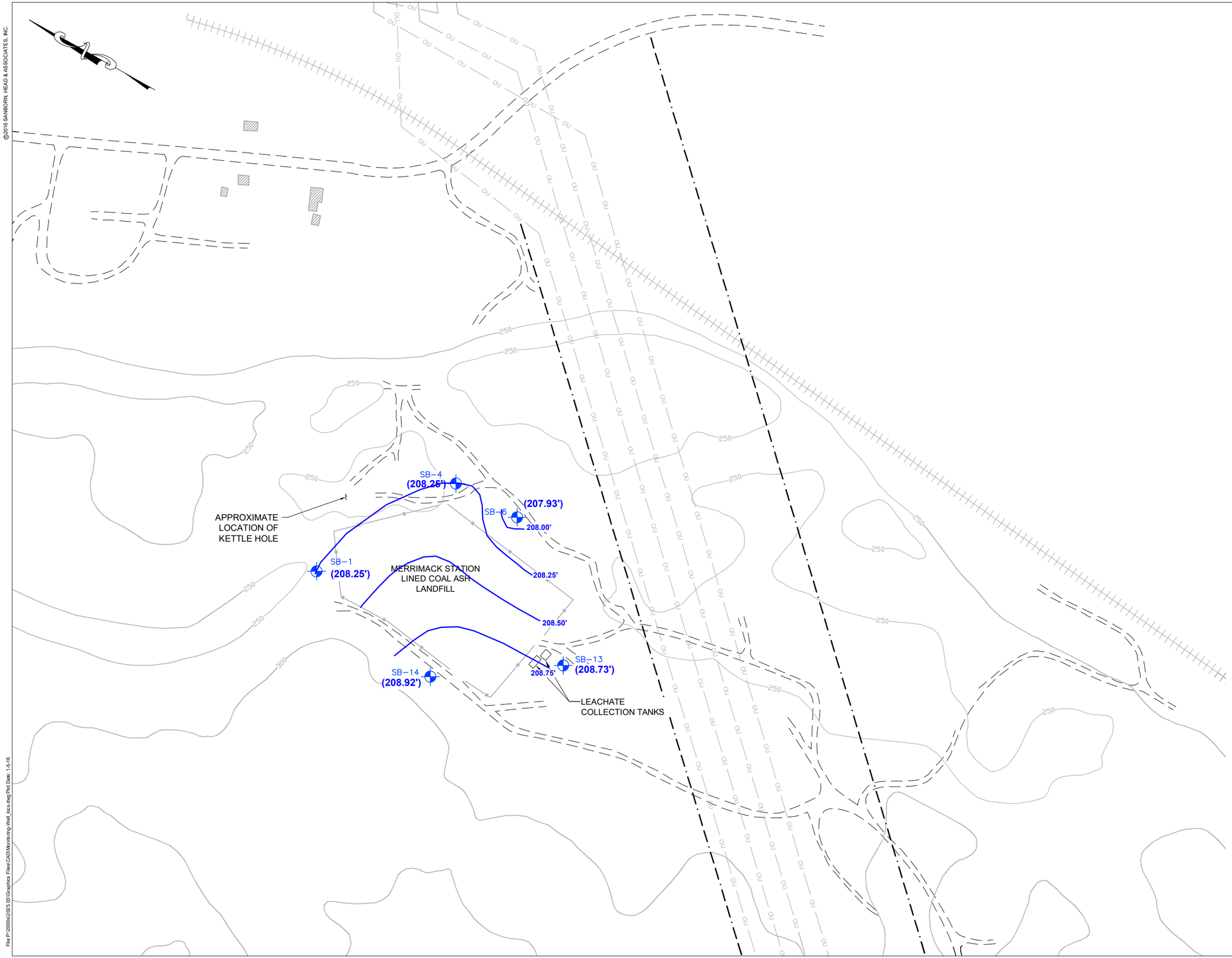


Figure 1.F

July 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By:	L. Teal
Designed By:	H. Roakes
Reviewed By:	A. Ashton
Project No:	2025.08
Date:	August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on July 25, 2018.

Legend

- SB-4 — Monitoring Well
- (207.93') — Groundwater Elevation Measured on July 25, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 208.25' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

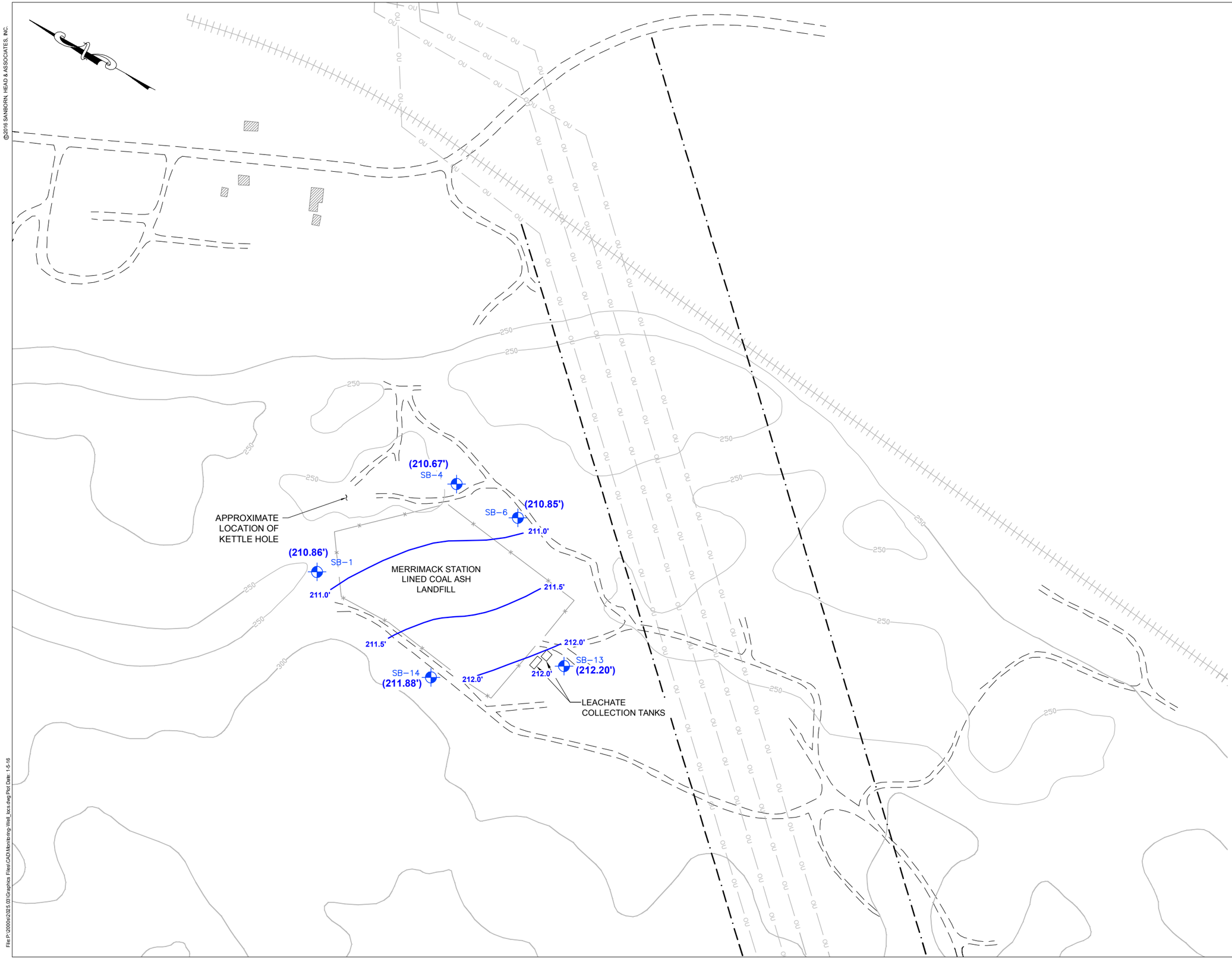


Figure 1.G

November 2018 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By:	L. Teal
Designed By:	H. Roakes
Reviewed By:	A. Ashton
Project No:	2025.08
Date:	August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on November 28, 2018.

Legend

- SB-4 — Monitoring Well
- (212.20') — Groundwater Elevation Measured on Nov. 28, 2018
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 212.0' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

(210.92')
SB-4
211.0'
SB-6 (211.17')
APPROXIMATE LOCATION OF KETTLE HOLE
211.0'
SB-1 (211.02')
MERRIMACK STATION LINED COAL ASH LANDFILL
211.5'
211.5'
212.0'
SB-13 (212.35')
SB-14 (211.98')
212.0'
LEACHATE COLLECTION TANKS

Figure 1.H

April 2019 Groundwater Contours

Merrimack Station
Coal Ash Landfill
Bow, New Hampshire

Drawn By:	L. Teal
Designed By:	H. Roakes
Reviewed By:	A. Ashton
Project No:	2025.08
Date:	August 2019

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 site and site features shown should be considered approximate only.

3. Groundwater contours shown on this plan were developed based on groundwater level measurements in the monitoring wells made on April 26, 2019.

Legend

- SB-4 — Monitoring Well
- (211.02') — Groundwater Elevation Measured on April 26, 2019
- Right-Of-Way
- Fence
- OU — Overhead Utilities
- 250 — Elevation Contour
- 211.02' — Groundwater Contour (dashed where less constrained)

150' 75' 0 150' 300' Feet

SANBORN HEAD

File:P:\2000\s\2025.03\Graphics Files\CAD\Monitoring Well_locs.dwg Plot Date: 1-5-16

ATTACHMENT A

ATTACHMENT A
QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I certify that the information in this alternative source demonstration (ASD) report, dated October 22, 2019 (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.

ERIC SCOTT STEINHAUSER

Printed Name of Licensed Professional Engineer

Signature

11494	NH	10/22/2019
License Number	Licensing State	Date

ATTACHMENT B

ATTACHMENT B
LIMITATIONS

1. The conclusions and recommendations presented 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 at 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.

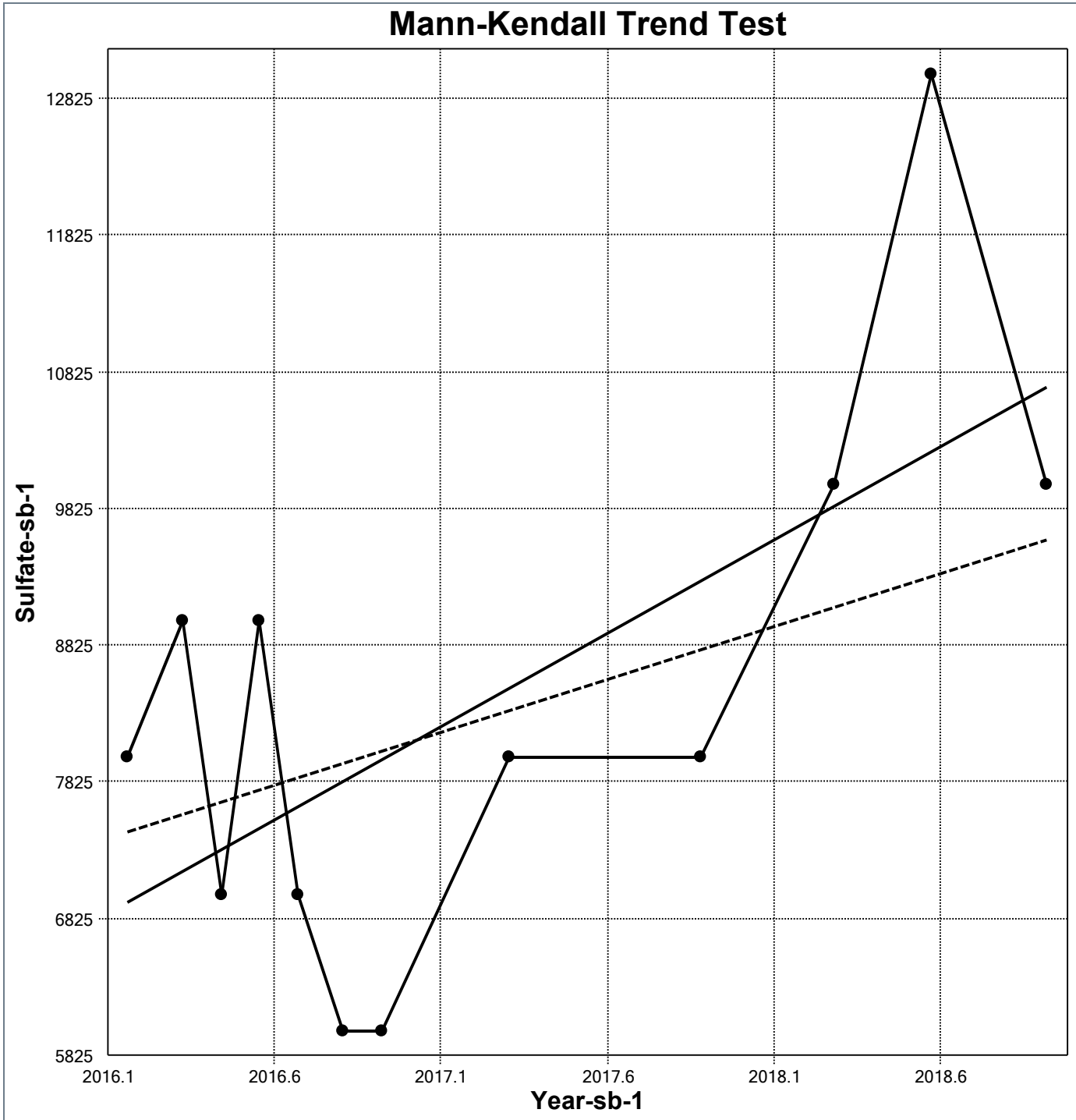
2. Water level measurements were made in the monitoring locations at times and under conditions stated within the report. Fluctuations in the levels of the groundwater may occur due to variations in precipitation and other factors not evident at the time measurements were made.

3. Quantitative laboratory analyses were performed as noted within the report. Compounds not searched for during the current study may be present in groundwater at the site. Sanborn Head relied upon the data provided by the analytical laboratory and did not perform an independent evaluation of the reliability of these data. Moreover, variations in the types and concentrations of contaminants 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 presented in this report were based in part upon various types of chemical data as well as historical and hydrogeologic information developed during previous studies. Sanborn Head reviewed the data and information as stated in this report and our interpretations, conclusions, and recommendations that rely on that information are 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 may be modified accordingly.

5. This report was prepared for the exclusive use of GSP Merrimack LLC for specific application for groundwater quality monitoring for the Merrimack Station Coal Ash Landfill site located in Bow, New Hampshire and was prepared in accordance with generally-accepted hydrogeologic practices. No warranty, express or implied, is made.

ATTACHMENT C



Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	14.3178
Standardized Value of S	1.2572
M-K Test Value (S)	19
Tabulated p-value	0.1250
Approximate p-value	0.1043

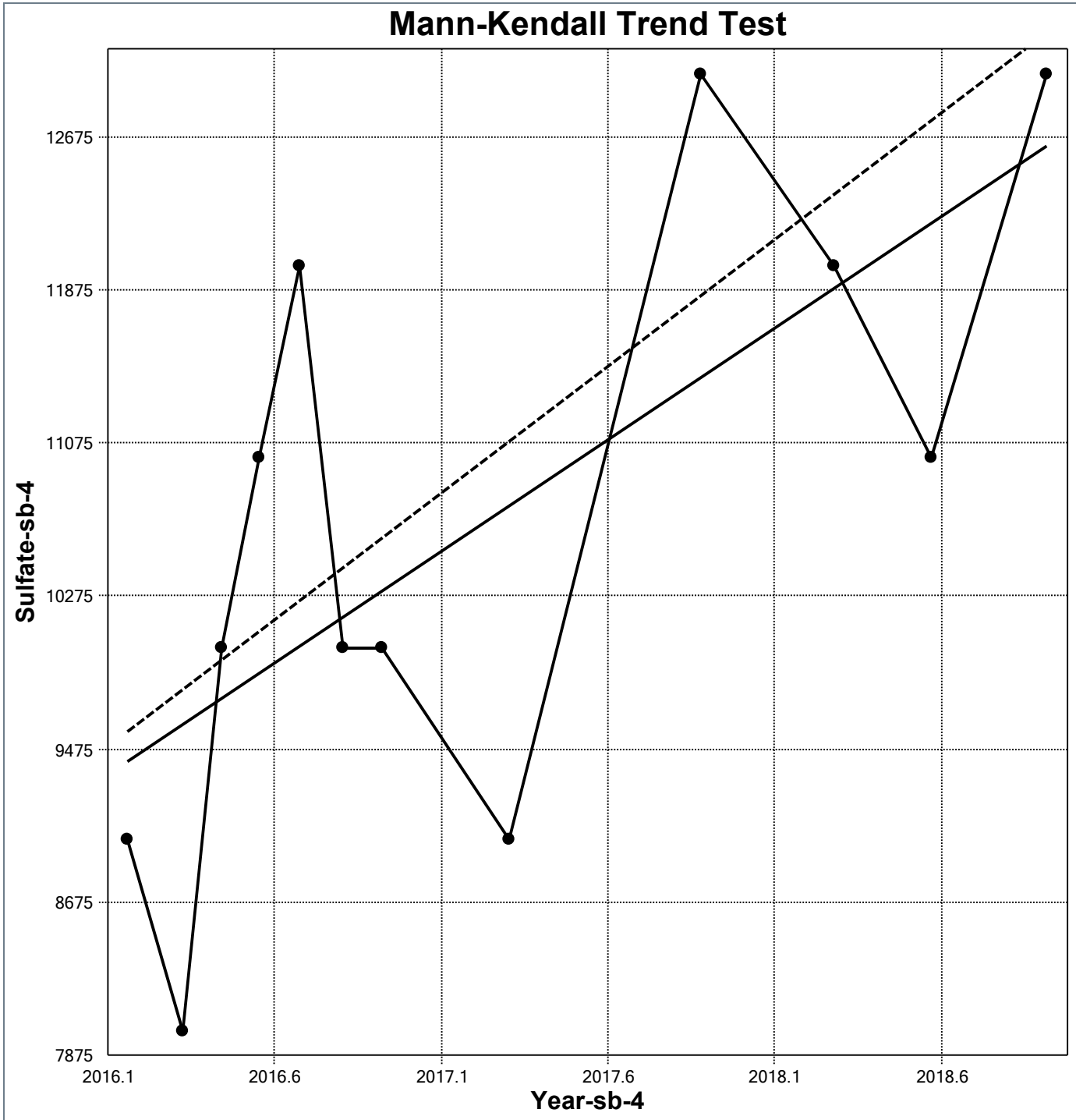
OLS Regression Line (solid)

OLS Regression Slope	1,364.2394
OLS Regression Intercept	-2,743,562.5821

Theil-Sen Trend Line (dashed)

Theil-Sen Slope	776.8759
Theil-Sen Intercept	-1,558,844.8232

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	14.3178
Standardized Value of S	2.0953
M-K Test Value (S)	31
Tabulated p-value	0.0220
Approximate p-value	0.0181

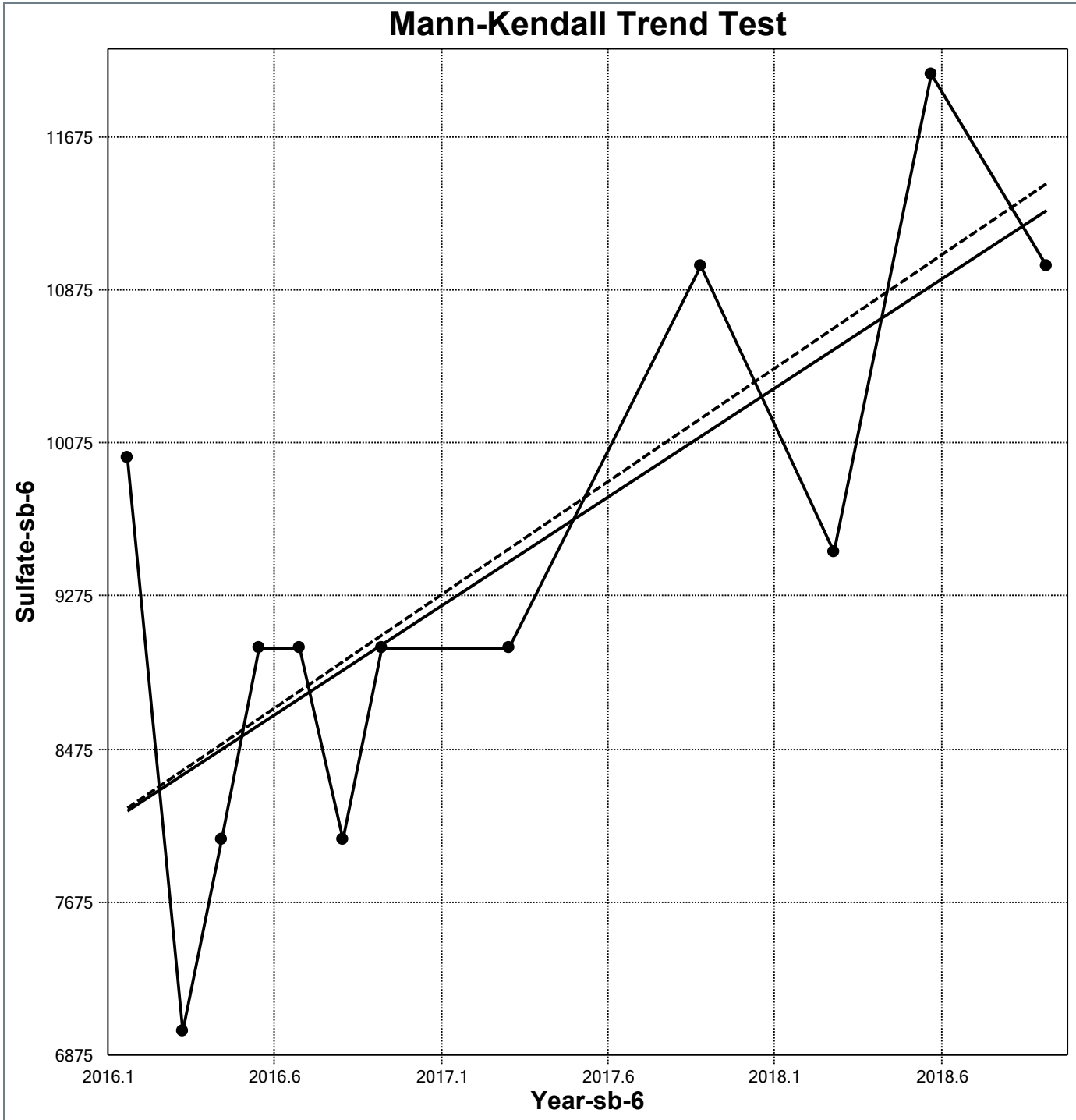
OLS Regression Line **(solid)**

OLS Regression Slope	1,164.3662
OLS Regression Intercept	-2,338,122.8911

Theil-Sen Trend Line **(dashed)**

Theil-Sen Slope	1,321.8048
Theil-Sen Intercept	-2,655,386.5187

Statistically significant evidence of an increasing trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	14.2127
Standardized Value of S	2.3219
M-K Test Value (S)	34
Tabulated p-value	0.0100
Approximate p-value	0.0101

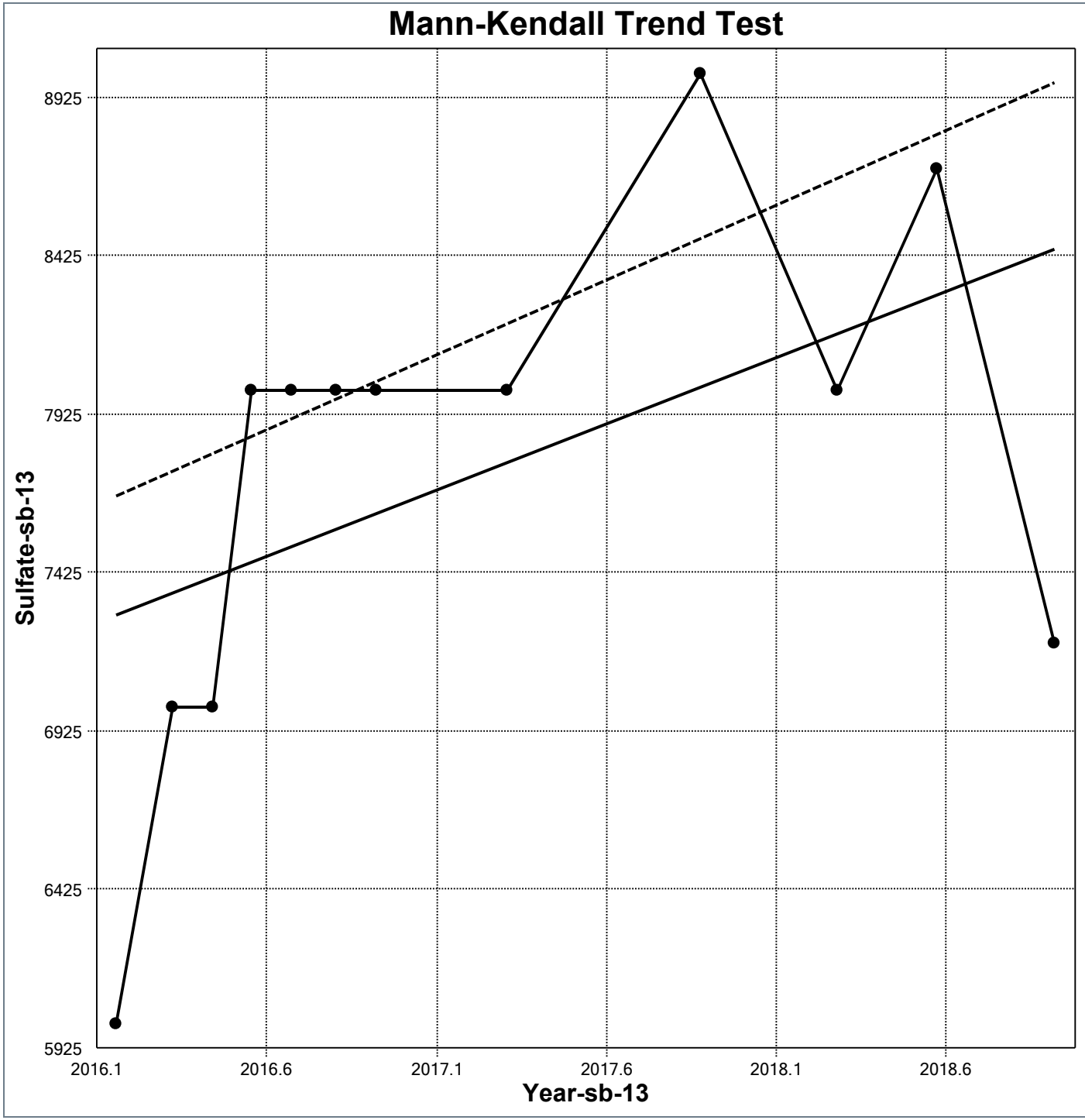
OLS Regression Line **(solid)**

OLS Regression Slope	1,136.9687
OLS Regression Intercept	-2,284,147.5395

Theil-Sen Trend Line **(dashed)**

Theil-Sen Slope	1,183.1732
Theil-Sen Intercept	-2,377,286.9980

Statistically significant evidence of an increasing trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	13.5401
Standardized Value of S	2.1418
M-K Test Value (S)	30
Tabulated p-value	0.0220
Approximate p-value	0.0161

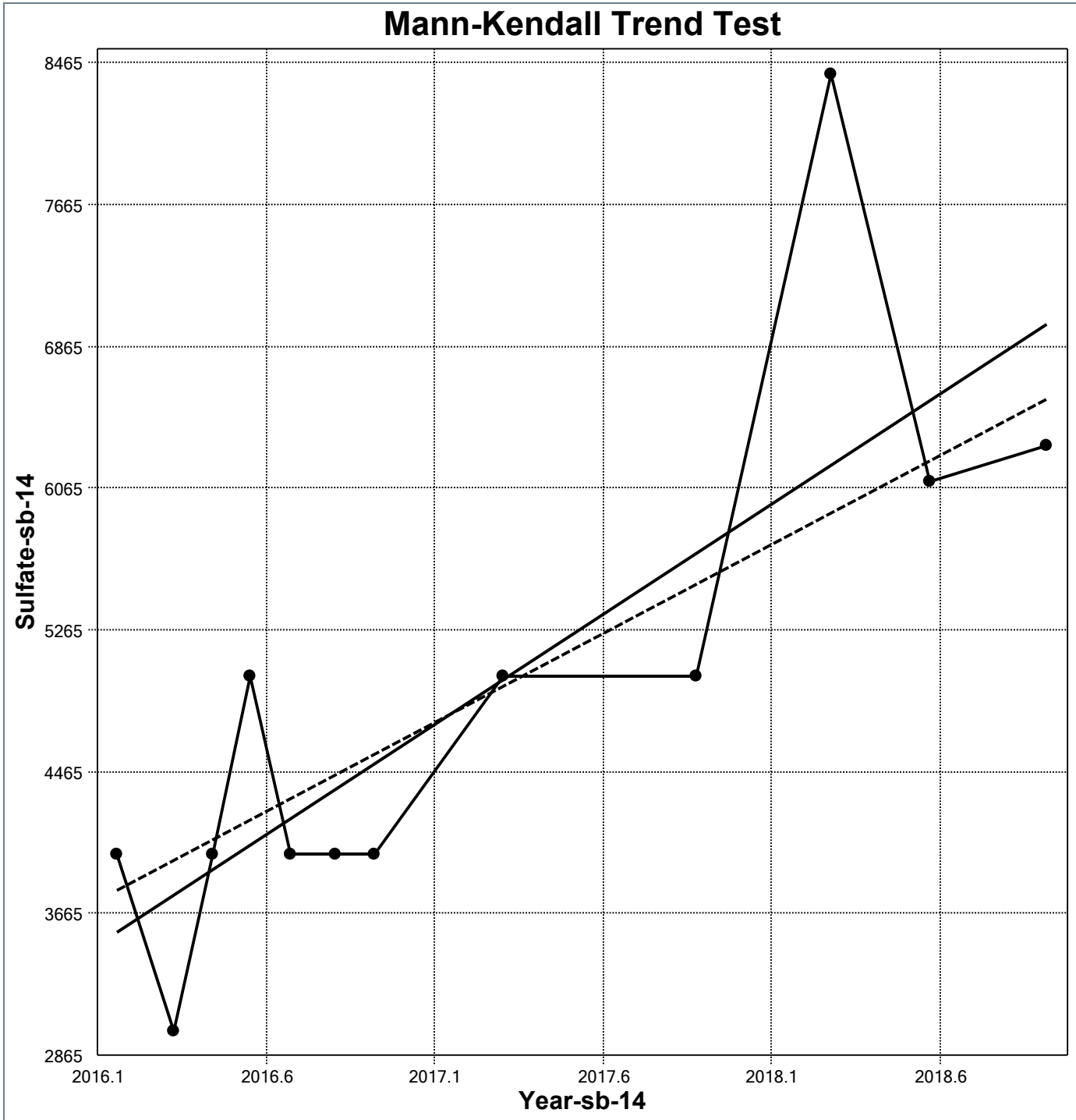
OLS Regression Line (solid)

OLS Regression Slope	417.6884
OLS Regression Intercept	-834,830.2162

Theil-Sen Trend Line (dashed)

Theil-Sen Slope	473.4384
Theil-Sen Intercept	-946,855.8296

Statistically significant evidence of an increasing trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	13.8684
Standardized Value of S	2.8842
M-K Test Value (S)	41
Tabulated p-value	0.0030
Approximate p-value	0.0020

OLS Regression Line (solid)

OLS Regression Slope	1,244.6330
OLS Regression Intercept	-2,505,805.7148

Theil-Sen Trend Line (dashed)

Theil-Sen Slope	1,005.1245
Theil-Sen Intercept	-2,022,688.8243

Statistically significant evidence of an increasing trend at the specified level of significance.

ATTACHMENT B

ANALYTICAL LABORATORY REPORTS

April 2019

SANBORN HEAD

Eastern Analytical, Inc.
professional laboratory and drilling services

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

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	194667
Client Identification:	Merrimack Station - Coal Ash
Date Received:	4/26/2019

Dear Mr. Palmer :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

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

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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) and New York (12072).

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 the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days 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 | 5.10.19 Date | 5 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **194667**

Client: **Granite Shore Power**

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

Temperature upon receipt (°C): 2.3 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
194667.01	SB-1	4/26/19	4/26/19	aqueous		Adheres to Sample Acceptance Policy
194667.02	SB-4	4/26/19	4/26/19	aqueous		Adheres to Sample Acceptance Policy
194667.03	SB-6	4/26/19	4/26/19	aqueous		Adheres to Sample Acceptance Policy
194667.04	SB-13	4/26/19	4/26/19	aqueous		Adheres to Sample Acceptance Policy
194667.05	SB-14	4/26/19	4/26/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

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

References include:

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

LABORATORY REPORT

EAI ID#: **194667**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6	SB-13					
Lab Sample ID:	194667.01	194667.02	194667.03	194667.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	4/26/19	4/26/19	4/26/19	4/26/19		Analysis			
Date Received:	4/26/19	4/26/19	4/26/19	4/26/19	**Units**	**Date**	**Time**	**Method**	**Analyst**
Solids Dissolved	**140**	**190**	**210**	**290**	mg/L	04/30/19	14:00	2540C-11	SR
Fluoride	< 0.1	< 0.1	< 0.1	< 0.1	mg/L	05/07/19	23:05	300.0	KD
Sulfate	**12**	**11**	**14**	**7.1**	mg/L	05/07/19	23:05	300.0	KD
Chloride	**55**	**94**	**150**	**200**	mg/L	05/07/19	23:05	300.0	KD
Alkalinity Total (CaCO3)	**18**	**18**	**9.1**	**7.2**	mg/L	04/30/19	9:09	2320B-11	ATA

Sample ID:	SB-14						
Lab Sample ID:	194667.05						
Matrix:	aqueous						
Date Sampled:	4/26/19	Analysis					
Date Received:	4/26/19	**Units**	**Date**	**Time**	**Method**	**Analyst**	
Solids Dissolved	**91**	mg/L	04/30/19	14:00	2540C-11	SR	
Fluoride	< 0.1	mg/L	05/08/19	1:38	300.0	KD	
Sulfate	**3.7**	mg/L	05/08/19	1:38	300.0	KD	
Chloride	**19**	mg/L	05/08/19	1:38	300.0	KD	
Alkalinity Total (CaCO3)	**13**	mg/L	04/30/19	9:09	2320B-11	ATA	

LABORATORY REPORT

EAI ID#: **194667**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6	SB-13					
Lab Sample ID:	194667.01	194667.02	194667.03	194667.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	4/26/19	4/26/19	4/26/19	4/26/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	4/26/19	4/26/19	4/26/19	4/26/19					
Boron	**0.10**	< 0.05	**0.084**	< 0.05	AqTot	mg/L	5/2/19	200.8	DS
Calcium	**13**	**13**	**13**	**14**	AqTot	mg/L	5/2/19	200.8	DS
Magnesium	**2.9**	**3.2**	**3.1**	**3.0**	AqTot	mg/L	5/2/19	200.8	DS
Potassium	**1.7**	**2.0**	**2.2**	**2.1**	AqTot	mg/L	5/2/19	200.8	DS
Sodium	**32**	**57**	**110**	**130**	AqTot	mg/L	5/2/19	200.8	DS

Sample ID:	SB-14						
Lab Sample ID:	194667.05						
Matrix:	aqueous						
Date Sampled:	4/26/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**	
Date Received:	4/26/19						
Boron	< 0.05	AqTot	mg/L	5/2/19	200.8	DS	
Calcium	**8.7**	AqTot	mg/L	5/2/19	200.8	DS	
Magnesium	**2.3**	AqTot	mg/L	5/2/19	200.8	DS	
Potassium	**0.83**	AqTot	mg/L	5/2/19	200.8	DS	
Sodium	**6.7**	AqTot	mg/L	5/2/19	200.8	DS	

LABORATORY REPORT

EAI ID#: **194667**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6	SB-13				
Lab Sample ID:	194667.01	194667.02	194667.03	194667.04				
Matrix:	aqueous	aqueous	aqueous	aqueous				
Date Sampled:	4/26/19	4/26/19	4/26/19	4/26/19				
					Units	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.78**	**5.83**	**5.78**	**5.53**	SU	4/26/19	SM4500H	JL

Sample ID:	SB-14							
Lab Sample ID:	194667.05							
Matrix:	aqueous							
Date Sampled:	4/26/19							
					Units	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.74**				SU	4/26/19	SM4500H	JG

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

194667

5

aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
SB-1	4/26/19 13:35	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		2
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-4	4/26/19 09:38	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		2
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-6	4/26/19 10:59	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		2
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-13	4/26/19 12:12	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		2
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-14	4/26/19 1224	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		2
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					

aClientID Merrimack Station - Coal Ash
nProjectID 3949 **nYearMonth** 2019.04
Client (Pro Mgr) Allan Palmer
Customer Granite Shore Power
Address 431 River Road
City Bow **NH** 03304
Phone 224-4081
Fax 224-4081

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 2.3 °C

Samples Collected by: JG, JL/AH

Relinquished by	Date/Time	Received by
[signature]	04/26/19 1445	[signature]
Relinquished by	Date/Time	Received by

July 2019

Eastern Analytical, Inc.

professional laboratory and drilling services

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

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 197811
Client Identification: Merrimack Station - Coal Ash
Date Received: 7/11/2019

Dear Mr. Palmer :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

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

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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) and New York (12072).

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 the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days 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 | 7.25.19 Date | 5 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **197811**

Client: **Granite Shore Power**

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

Temperature upon receipt (°C): 3.1 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
197811.01	SB-6	7/11/19	7/11/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

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

References include:

1) EPA 600/4-79-020, 1983

2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.

3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB

4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **197811**

Client: **Granite Shore Power**

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

Sample ID: SB-6

Lab Sample ID: 197811.01

Matrix: aqueous

Date Sampled: 7/11/19

Date Received: 7/11/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Solids Dissolved	**330**	mg/L	7/12/19	11:05	2540C-11	SR
Sulfate	**15**	mg/L	7/22/19	19:41	300.0	KD
Chloride	**170**	mg/L	7/12/19	16:10	4500CLE-11	KD
Alkalinity Total (CaCO3)	**8.1**	mg/L	7/12/19	7:51	2320B-11	ATA

LABORATORY REPORT

EAI ID#: **197811**

Client: **Granite Shore Power**

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

Sample ID: SB-6

Lab Sample ID: 197811.01
Matrix: aqueous
Date Sampled: 7/11/19
Date Received: 7/11/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Boron	**0.08**	AqTot	mg/L	7/15/19	200.8	DS
Calcium	**14**	AqTot	mg/L	7/15/19	200.8	DS
Magnesium	**3.4**	AqTot	mg/L	7/15/19	200.8	DS
Potassium	**2.1**	AqTot	mg/L	7/15/19	200.8	DS
Sodium	**110**	AqTot	mg/L	7/15/19	200.8	DS

LABORATORY REPORT

EAI ID#: **197811**

Client: **Granite Shore Power**

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

Sample ID: SB-6

Lab Sample ID: 197811.01

Matrix: aqueous

Date Sampled: 7/11/19

		Units	Date of Analysis	Method	Analyst
Field pH	**5.84**	SU	7/11/19	SM4500	JG

CHAIN-OF-CUSTODY RECORD

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professional laboratory services

197811 5

aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
SB-6	7/11/19 1207	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4

preservative: HCl (HNO$_3$) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)

aClientID Merrimack Station - Coal Ash
nProjectID 3949 **nYearMonth** 2019.07
Client (Pro Mgr) Allan Palmer
Customer Granite Shore Power
Address 431 River Road
City Bow **NH** 03304
Phone 224-4081
Fax 224-4081

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 3.1 °C

Samples Collected by: JG, EB/GM

Relinquished by	Date/Time	Received by
	7/11/19 1545	
Relinquished by	Date/Time	Received by

November 2019

SANBORN HEAD

Eastern Analytical, Inc.

professional laboratory and drilling services

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

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	203471
Client Identification:	Merrimack Station - Coal Ash
Date Received:	11/15/2019

Dear Mr. Palmer :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

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

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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) and New York (12072).

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 the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days 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 for — 12.6.19 — 5

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **203471**

Client: **Granite Shore Power**

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

Temperature upon receipt (°C): 4.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
203471.01	SB-1	11/15/19	11/15/19	aqueous		Adheres to Sample Acceptance Policy
203471.02	SB-4	11/15/19	11/15/19	aqueous		Adheres to Sample Acceptance Policy
203471.03	SB-6	11/15/19	11/15/19	aqueous		Adheres to Sample Acceptance Policy
203471.04	SB-13	11/15/19	11/15/19	aqueous		Adheres to Sample Acceptance Policy
203471.05	SB-14	11/15/19	11/15/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

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

References include:

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

LABORATORY REPORT

EAI ID#: **203471**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6	SB-13					
Lab Sample ID:	203471.01	203471.02	203471.03	203471.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	11/15/19	11/15/19	11/15/19	11/15/19		Analysis			
Date Received:	11/15/19	11/15/19	11/15/19	11/15/19	**Units**	**Date**	**Time**	**Method**	**Analyst**
Solids Dissolved	**140**	**230**	**280**	**280**	mg/L	11/18/19	16:10	2540C-11	SR
Fluoride	< 0.1	< 0.1	< 0.1	< 0.1	mg/L	11/27/19	1:20	300.0	KD
Sulfate	**10**	**11**	**13**	**8.1**	mg/L	11/27/19	1:20	300.0	KD
Chloride	**68**	**97**	**140**	**140**	mg/L	11/27/19	1:20	300.0	KD
Alkalinity Total (CaCO3)	**6.4**	**24**	**9.3**	**8.8**	mg/L	11/16/19	13:08	2320B-11	ATA

Sample ID:	SB-14						
Lab Sample ID:	203471.05						
Matrix:	aqueous						
Date Sampled:	11/15/19	Analysis					
Date Received:	11/15/19	**Units**	**Date**	**Time**	**Method**	**Analyst**	
Solids Dissolved	**69**	mg/L	11/18/19	16:10	2540C-11	SR	
Fluoride	< 0.1	mg/L	11/27/19	2:14	300.0	KD	
Sulfate	**7.8**	mg/L	11/27/19	2:14	300.0	KD	
Chloride	**12**	mg/L	11/27/19	2:14	300.0	KD	
Alkalinity Total (CaCO3)	**12**	mg/L	11/16/19	13:08	2320B-11	ATA	

LABORATORY REPORT

EAI ID#: **203471**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6	SB-13					
Lab Sample ID:	203471.01	203471.02	203471.03	203471.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	11/15/19	11/15/19	11/15/19	11/15/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	11/15/19	11/15/19	11/15/19	11/15/19					
Boron	**0.059**	**0.053**	**0.052**	< 0.05	AqTot	mg/L	12/3/19	200.8	DS
Calcium	**11**	**11**	**10**	**8.1**	AqTot	mg/L	12/3/19	200.8	DS
Magnesium	**2.9**	**2.9**	**2.6**	**1.9**	AqTot	mg/L	12/3/19	200.8	DS
Potassium	**1.6**	**2.1**	**1.9**	**1.6**	AqTot	mg/L	12/3/19	200.8	DS
Sodium	**35**	**65**	**84**	**86**	AqTot	mg/L	12/3/19	200.8	DS

Sample ID:	SB-14							
Lab Sample ID:	203471.05							
Matrix:	aqueous							
Date Sampled:	11/15/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**		
Date Received:	11/15/19							
Boron	< 0.05	AqTot	mg/L	12/3/19	200.8	DS		
Calcium	**5.0**	AqTot	mg/L	12/3/19	200.8	DS		
Magnesium	**1.3**	AqTot	mg/L	12/3/19	200.8	DS		
Potassium	**0.80**	AqTot	mg/L	12/3/19	200.8	DS		
Sodium	**12**	AqTot	mg/L	12/3/19	200.8	DS		

LABORATORY REPORT

EAI ID#: **203471**

Client: **Granite Shore Power**

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

Sample ID:	SB-1	SB-4	SB-6				
Lab Sample ID:	203471.01	203471.02	203471.03				
Matrix:	aqueous	aqueous	aqueous				
Date Sampled:	11/15/19	11/15/19	11/15/19				
				Units	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.56**	**5.75**	**5.75**	SU	11/15/19	SM4500H	TNC

Sample ID:	SB-13	SB-14				
Lab Sample ID:	203471.04	203471.05				
Matrix:	aqueous	aqueous				
Date Sampled:	11/15/19	11/15/19				
			Units	**Date of Analysis**	**Method**	**Analyst**
Field pH	**5.82**	**5.94**	SU	11/15/19	SM4500H	JL

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

203471

5

aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
SB-1	11/15/2019 13:55	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-4	11/15/2019 10:20	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-6	11/15/2019 12:10	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-13	11/15/2019 10:57	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					
SB-14	11/15/2019 14:08	GW	Total Boron, Calcium, Magnesium, Potassium, Sodium, Flouride, Chloride, Sulfate, Field pH, Total Dissolved Solids, Total Alkalinity		4
preservative: HCL (HNO3) H_2SO_4 NaOH MEOH $Na_2S_2O_3$ (ICE)					

aClientID Merrimack Station - Coal Ash
nProjectID 3949 **nYearMonth** 2019.11
Client (Pro Mgr) Allan Palmer
Customer Granite Shore Power
Address 431 River Road
City Bow **NH** 03304
Phone 224-4081
Fax 224-4081

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 4.5 °C

Samples Collected by: _____

Relinquished by	Date/Time	Received by
	11/15/19 1615	
Relinquished by	Date/Time	Received by