

## Memorandum

Date: May 21, 2026

To: Pryce Warren, American Electric Power (AEP)

From: Beth Gross, PhD, PE (OK) and Allison Kreinberg, Geosyntec

Subject: Alternative Source Demonstration Update – 2<sup>nd</sup> Semiannual Event 2025  
Northeastern Power Station Bottom Ash Pond  
Oologah, Rogers County, Oklahoma

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The Bottom Ash Pond (BAP) is a regulated coal combustion residual (CCR) unit at the Northeastern Power Station (NPS) in Oologah, Oklahoma. A semiannual assessment monitoring event was completed at the BAP on October 27, 2025, in accordance with the assessment monitoring requirements of Oklahoma Administrative Code (OAC) 252:517-9-6. Analysis of the October 2025 data identified statistically significant levels (SSLs) above the groundwater protection standards (GWPSs) for lithium, fluoride, barium, and combined radium at SP-10 (Geosyntec 2026a in **Attachment A**). The following SSLs were identified at the Northeastern BAP:

- The lower confidence limit (LCL) for lithium exceeded the GWPS of 0.123 milligrams per liter (mg/L) at SP-10 (0.234 mg/L).
- The LCL for fluoride exceeded the GWPS of 4.39 mg/L at SP-10 (6.29 mg/L).
- The LCL for barium exceeded the GWPS of 2.77 mg/L at SP-10 (4.60 mg/L).
- The LCL for combined radium exceeded the GWPS of 16.2 picocuries per liter (pCi/L) at SP-10 (18.8 pCi/L).

### 1. LITHIUM, FLUORIDE, AND BARIUM

Key lithium, fluoride, and barium analytical results for samples collected from the BAP and from SP-10 are provided in **Table 1**. As described in previous alternative source demonstrations (ASDs) (Geosyntec 2019, Geosyntec 2021a, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a, Geosyntec 2023b, Geosyntec 2023c, Geosyntec 2024a, Geosyntec 2024b, Geosyntec 2025, Geosyntec 2026b), concentrations of lithium, fluoride, and barium in the BAP water (including pore water) and BAP sediments that are lower than concentrations observed at SP-10 suggest that the BAP is not the source of these exceedances. These previous ASDs

demonstrate that the release of lithium from the clay minerals in the shale lens located at 46 feet below ground surface in the screened interval of SP-10 is the likely source of lithium in groundwater at that location. Analytical results suggest that naturally occurring barium and fluoride are also associated with the shale lenses and are contributing to aqueous barium and fluoride concentrations at SP-10.

The Oklahoma Department of Environmental Quality (DEQ) previously noted in a letter to the NPS dated June 4, 2021, that “[i]f lithium and fluoride continue to exceed their relative GWPS in the future and conditions have not changed, NPS may refer to the October 29, 2019 ASD approval for lithium and this [June 4, 2021] approval for fluoride and continue assessment monitoring for the BAP in accordance with OAC 252:517-6(g)(3)(B)” (DEQ 2021). DEQ provided a similar letter to the NPS dated September 20, 2022, that indicated that the July 14, 2022 ASD “is applicable for the barium exceedance in SP-10 of the GWPS if conditions do not change. AEP may refer to the ASD approval for barium and continue assessment monitoring for the BAP in accordance with OAC 252:517-9-6(g)(3)(B)” (DEQ 2022). This ASD update presents an evaluation of the BAP for changing conditions that may affect previously approved ASDs for lithium, fluoride, and barium exceedances at SP-10.

The groundwater sample collected from the October 2025 monitoring event at SP-10 contained a lithium concentration of 0.225 mg/L, fluoride concentration of 7.1 mg/L, and barium concentration of 6.62 mg/L. The lithium concentration (**Figure 1**) and fluoride concentration (**Figure 2**) are consistent with previous results collected during the assessment monitoring period and continue to show no statistically significant positive trends. This is an indication that conditions have not changed substantially since the preceding ASD was submitted (Geosyntec 2026b), and the arguments presented in the previous ASDs are still valid. Therefore, the lithium and fluoride concentrations at SP-10 during the October 2025 assessment monitoring event are not attributed to a release from the BAP.

A time series plot of the barium concentrations at SP-10 and a Mann-Kendall statistical analysis of the reported barium results over time are shown in **Figure 3**. The analysis determined that barium concentrations at SP-10 display a statistically significant increasing trend. However, based on a Piper diagram showing select events where the full suite of major cations and anions were sampled (**Figure 4**), the geochemistry at monitoring well SP-10 does not change over time in a manner indicative of a release from the BAP. The October 2025 sample is displayed on the plot as the purple star. **Figure 4** demonstrates that the geochemistry of SP-10 has remained consistent over the past several years, indicating that groundwater condition at SP-10 is geochemically stable.

## 2. COMBINED RADIUM

Key radium analytical results for samples collected from the BAP and from SP-10 are provided in **Table 2**. As described in **Attachment A** (Geosyntec 2026a), the dataset for combined radium at SP-10 was truncated to better represent current groundwater conditions. This change in statistical method resulted in a new SSL for combined radium at SP-10.

## 2.1 Comparison of Combined Radium Concentrations

A sample of fly ash from the NPS was analyzed via synthetic precipitation leaching procedure (SPLP) to assess whether radium was readily leached from CCR material generated at the Site (**Attachment B**). While the BAP does not receive fly ash, radium is preferentially partitioned into the fly ash during coal combustion (Fidanchevski et al. 2021; Jaworowski 1990); therefore, comparison of radium leached from fly ash to groundwater concentrations is conservative relative to a comparison with potential concentrations leached from bottom ash. Analysis of the leachate from the SPLP test indicates that the combined radium SSL was not due to a release from the CCR material. The combined radium concentration in the SPLP leachate sample was 4.9142 pCi/L (**Table 2**). This combined radium concentration is 3 to 4 times below the combined radium LCL at SP-10 (18.8 pCi/L), the GWPS (16.2 pCi/L), and the concentration in the October 2025 sample from SP-10 (19.70 pCi/L). Given that the concentrations that are available to leach from CCR materials at NPS are lower than those observed in groundwater, the BAP is not the likely source of combined radium at SP-10.

## 2.2 Isotopic Composition of Combined Radium

Combined radium is calculated from the sum of the concentrations of the radium-226 and radium-228 isotopes. The isotopic composition of combined radium in groundwater is indicative of the source material (Sturchio et al. 2001; Szabo et al. 2012). Radium-226 consisted of 0.5% of the combined radium in the SPLP leachate sample and 97.4% of the combined radium in the October 2025 sample from SP-10 (**Table 2**). This difference in the isotopic composition of the combined radium in groundwater provides further evidence that the BAP is not the likely source of combined radium at SP-10.

The contribution of radium-226 to the combined radium concentration in unimpacted samples and SP-10 samples was used to characterize the isotopic composition of combined radium in naturally occurring groundwater at the site (**Figure 5**). Unimpacted samples were collected from the upgradient wells in the BAP network (SP-4 and SP-5R) and from two additional wells physically isolated from potential CCR impacts (MW-18 and MW-19). The ratios of radium-226 to combined radium is strongly correlated at SP-10 ( $R^2 = 0.91$ ) even as the combined radium concentration has increased over time. Furthermore, the radium isotope distribution at SP-10 is consistent with historical results across the site including at unimpacted, background locations ( $R^2 = 0.90$ ). Therefore, the BAP is not the source of combined radium at SP-10 and instead the radium at the site likely has a consistent naturally occurring source.

## 2.3 Site-Wide Distribution

Elevated levels of combined radium are found throughout the site. The maximum combined radium concentrations observed at each well were plotted on a map of the site to visualize the spatial distribution of combined radium (**Figure 6**). Concentrations of combined radium comparable to those at SP-10 have been observed in upgradient well SP-5R, unimpacted well MW-19, and downgradient wells SP-2 and SP-11. The remaining wells have maximum concentrations

below the maximum concentration at SP-10; however, all maximum concentrations are above the combined radium concentration in the SPLP leachate sample (4.9142 pCi/L).

Radium is known to associate with carbonate minerals through processes such as sorption and precipitation (Jones et al. 2011) and incorporation into biogenic carbonate from sea life (Schmidt and Cochran 2010). While present at deeper elevations than the BAP monitoring wells, elevated concentrations of combined radium above the maximum contaminant level of 5 pCi/L have been found in Ordovician-aged carbonate aquifers in the midcontinent United States, including Oklahoma (Sturchio et al. 2001; Szabo et al. 2012). Higher aqueous radium concentrations may be observed in carbonate aquifers due to the limited abundance of sorbing surfaces that would remove radium from groundwater (Szabo et al. 2012).

This known relationship between radium and carbonate minerals, such as those found in the Oologah formation limestone in which SP-10 is screened, suggests that natural variability is the likely source of the elevated levels of combined radium across the Site.

## 2.4 Relationship with Barium

Combined radium and barium have a positive correlation and behave similarly due to their similar ionic radii (Sturchio et al. 2001; Szabo et al. 2012). Barium can be used as a proxy for understanding the movement and sources of combined radium.

A review of barium and combined radium at SP-10 over time shows similar behavior and recent increasing trends (**Figure 7**). Similar to combined radium, the SSL for barium was originally identified when the statistical method was updated to truncate the dataset. The barium SSL has been attributed to shale lenses identified within the screened interval of SP-10 (Geosyntec 2022). Laboratory studies have confirmed that elevated barium concentrations may be associated with the clay minerals found in the shale lenses due to their cation exchange capacity (Eylen, et. al 1990; Atun and Bascetin 2003). Because barium and combined radium behave similarly, this suggests a potential geologic source of combined radium.

## 3. CONCLUSION

The information above, as well as the information presented in previous ASDs (Geosyntec 2019, Geosyntec 2021a, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a, Geosyntec 2023b, Geosyntec 2023c, Geosyntec 2024a, Geosyntec 2024b, Geosyntec 2025, Geosyntec 2026b), continues to support the position that barium, fluoride, and lithium concentrations are a result of natural variation in the underlying lithology, including the presence of shale lenses containing these elements within the screened interval at SP-10. This ASD also provides information that the combined radium concentrations at SP-10 are not attributable to the BAP and instead are a result of natural variation. Therefore, no further action is warranted. Certification of this ASD memorandum by a qualified professional engineer is in **Attachment C**.

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## REFERENCES

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# TABLES

**Table 1. Summary of Key Analytical Data**  
**Alternative Source Demonstration Update Memorandum**  
**Northeastern Power Station Bottom Ash Pond, Oologah, Oklahoma**

<b>Sample</b>	<b>Sample Date</b>	<b>Lithium Concentration (mg/L)</b>	<b>Fluoride Concentration (mg/L)</b>	<b>Barium Concentration (mg/L)</b>
SPLP Leachate of Bottom Ash	7/10/2019	0.001	0.458	0.352
	8/25/2022	< 0.5	NA	0.22
BAP Surface Water	2/5/2019	0.00874	0.37	0.315
BAP Pore Water	7/10/2019	0.003	< 0.83	0.083
SP-10 October 2025 Result	10/27/2025	0.225	7.1	6.62

Notes:

1. Nondetect results are shown as less than the reporting limit.

BAP: Bottom Ash Pond

mg/L: milligram per liter

NA: not analyzed

SPLP: synthetic precipitation leaching procedure

**Table 2. Summary of Key Radium Data  
Alternative Source Demonstration Update Memorandum  
Northeastern Power Station Bottom Ash Pond, Oologah, Oklahoma**

<b>Sample</b>	<b>Sample Date</b>	<b>Radium-226 Concentration (pCi/L)</b>	<b>Radium-228 Concentration (pCi/L)</b>	<b>Combined Radium Concentration (pCi/L)</b>	<b>Percentage of Radium-226 in Combined Radium</b>
SPLP Leachate of Ash	10/20/2020	0.0242	4.89	4.9142	0.5%
SP-10 October 2025 Result	10/27/2025	19.20	0.50	19.70	97.5%

Notes:

pCi/L: picocuries per liter

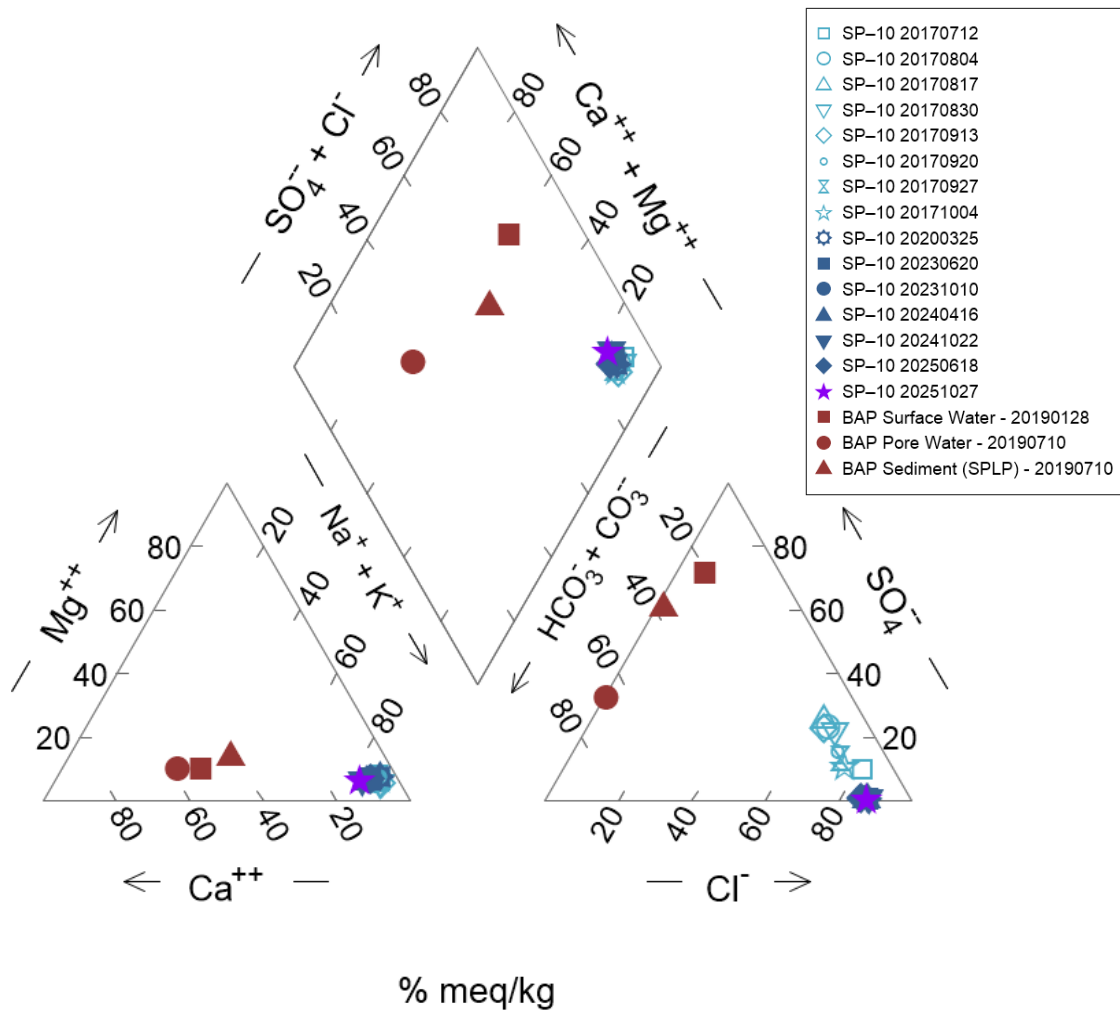
SPLP: synthetic precipitation leaching procedure

# FIGURES









Notes:  
 % meq/kg: percent milliequivalents per kilogram  
 SPLP: synthetic precipitation leaching procedure

**Piper Diagram – SP-10 and BAP Samples**  
 Northeastern Bottom Ash Pond

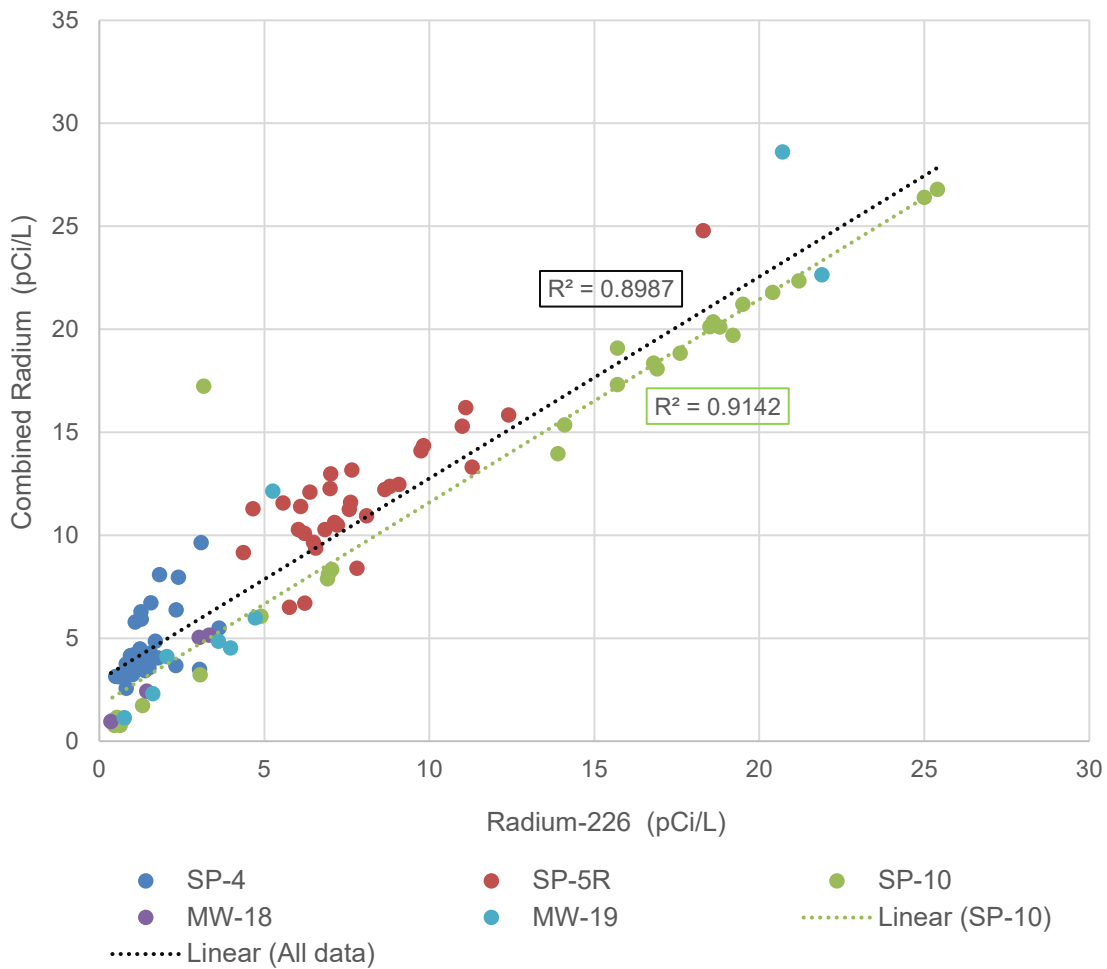
Geosyntec  
 consultants



Figure  
 4

Columbus, Ohio

May 2026



Notes: Comparison of radium-226 to combined radium results for SP-10 and unimpacted wells. Trend lines show relative ratios for radium data at SP-10 (green dotted line) and all wells shown (black dotted line).

pCi/L: picocuries per liter

### Comparison of Radium-226 to Combined Radium Results

Northeastern Bottom Ash Pond

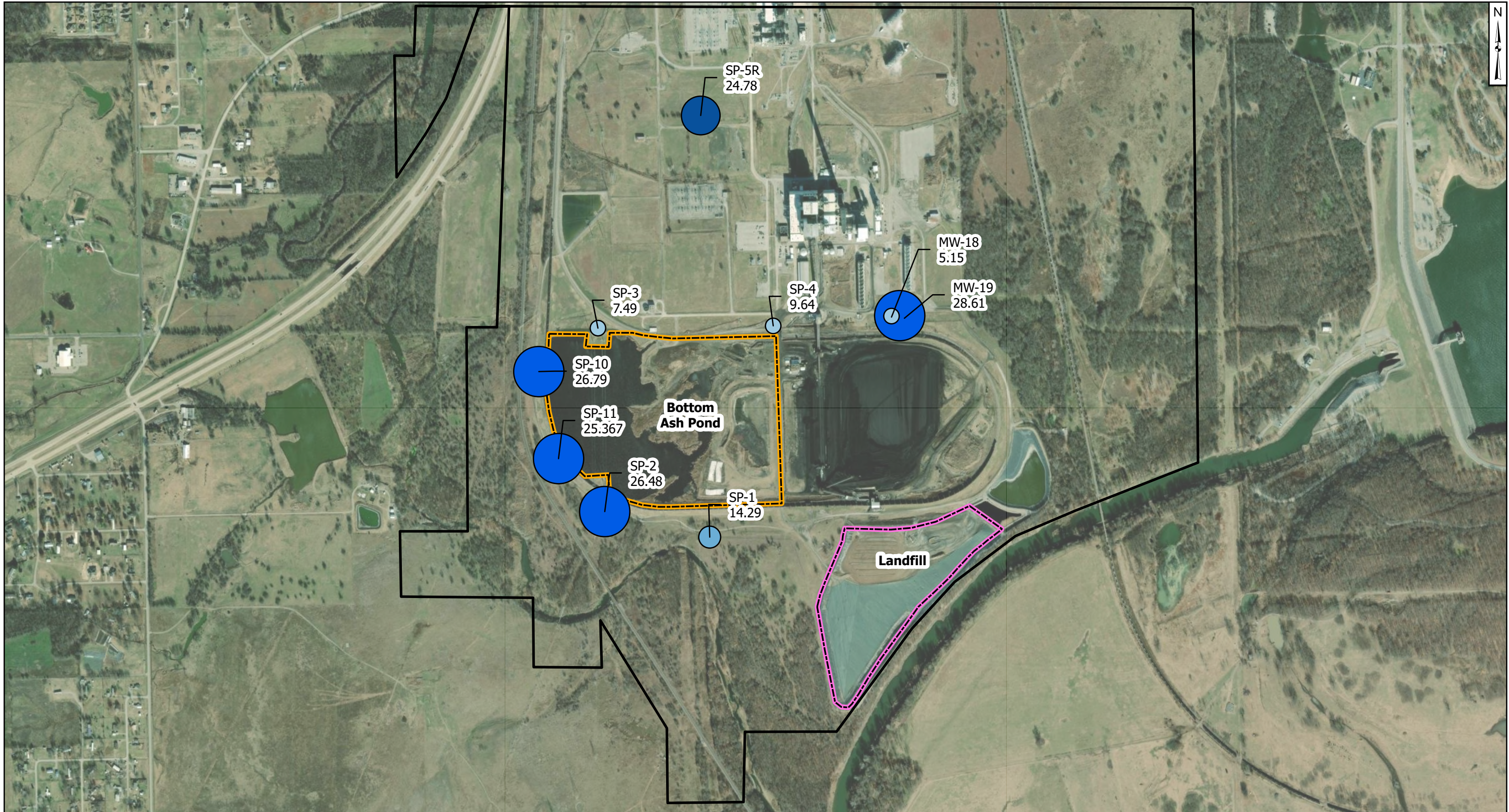
Geosyntec  
consultants



Figure  
5

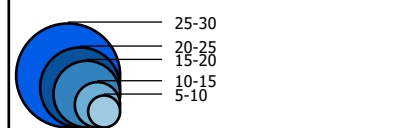
Columbus, Ohio

May 2026



**Legend**

Maximum Combined Radium (pCi/L)



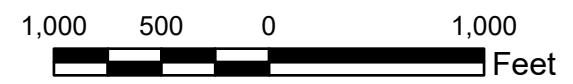
Site Property Boundary

Bottom Ash Pond

Landfill

**Notes**

- Approximate site property boundary provided by AEP.
- Aerial imagery obtained from ESRI (December 2023).
- Maximum combined radium concentrations shown in picocuries per liter (pCi/L).



**Maximum Combined Radium Distribution**

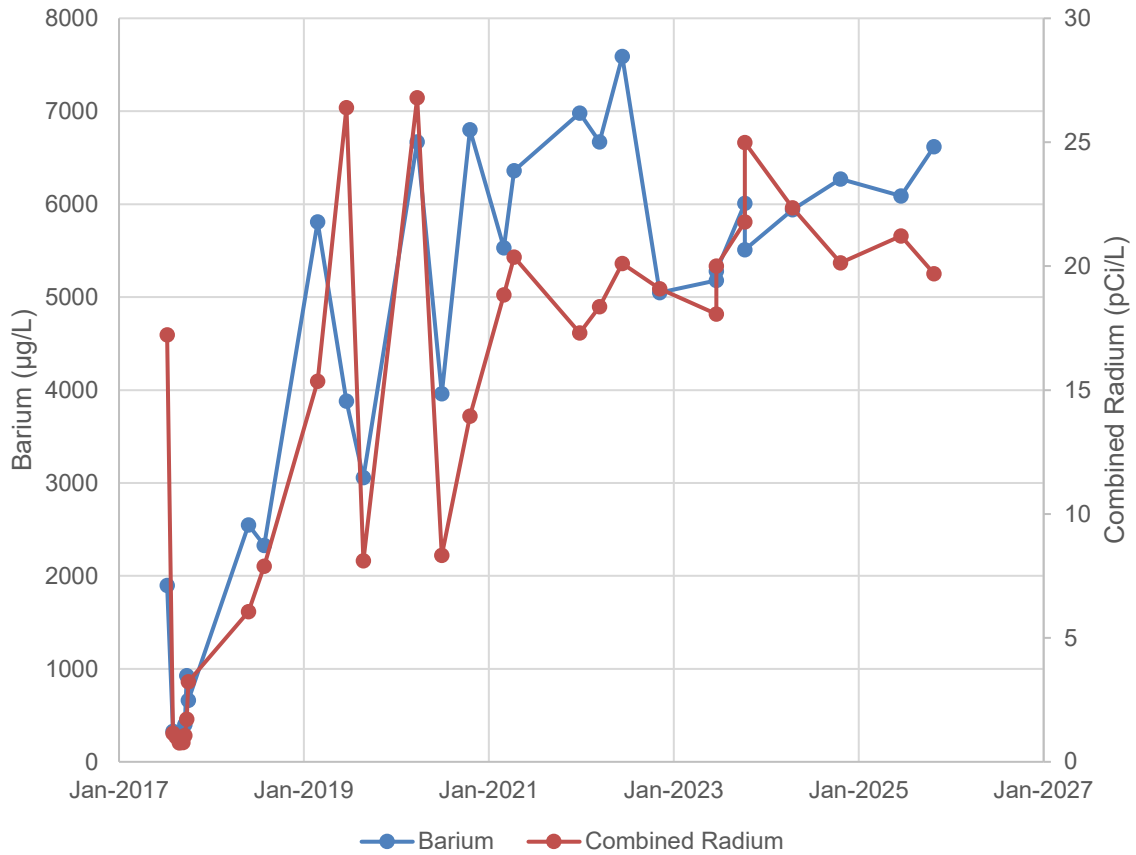
AEP Northeastern Power Plant - Landfill  
Oologah, Oklahoma

**Geosyntec**  
consultants

**Figure**  
**6**

Columbus, Ohio

May 2026



Notes: Barium and combined radium results from monitoring well SP-10 are displayed on the time series plot.

pCi/L: picocuries per liter  
 µg/L: micrograms per liter

**Barium and Combined Radium Time Series:  
 SP-10**

Northeastern Bottom Ash Pond



Figure  
**7**

Columbus, Ohio

May 2026

**Attachment A**  
Assessment Statistics Summary  
2025 First Semiannual Event

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# STATISTICAL ANALYSIS SUMMARY, 2025 2<sup>ND</sup> SEMIANNUAL EVENT BOTTOM ASH POND

## Northeastern Power Station Oologah, Oklahoma

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Attachment B:	Statistical Analysis Output

## ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
BAP	bottom ash pond
CCR	coal combustion residuals
GWPS	groundwater protection standard
LCL	lower confidence limit
LPL	lower prediction limit
mg/L	milligrams per liter
NPS	Northeastern Power Station
OAC	Oklahoma Administrative Code
PQL	practical quantitation limit
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
UPL	upper prediction limit

## 1. INTRODUCTION

In accordance with Oklahoma Department of Environmental Quality requirements regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Oklahoma Administrative Code [OAC] 252:517), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Northeastern Power Station (NPS) in Oologah, Oklahoma. Recent groundwater monitoring results were used to identify concentrations of Appendix B constituents that are above site-specific groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, chloride, fluoride, total dissolved solids (TDS), and sulfate at the BAP. In addition, pH values below the lower prediction limit (LPL) resulted in SSIs below background as well. GWPSs were set in accordance with OAC 252:517-9-6(h) and a statistical evaluation of the assessment monitoring was conducted.

During 2025, a sampling event for both Appendix A parameters and Appendix B parameters, as required by OAC 252:517-9-6(d), was completed in June. During the June 2025 assessment monitoring event, statistically significant levels (SSLs) were observed for barium, fluoride, and lithium (Geosyntec 2025a). An alternative source demonstration (ASD) was successfully completed (Geosyntec 2026), and the unit therefore remained in assessment monitoring. One assessment monitoring event was conducted at the BAP in October 2025 in accordance with OAC 252:517-9-6(d). Results of this event are documented in this report.

Prior to conducting the statistical analyses, the groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were reestablished for the Appendix B parameters. Confidence intervals were calculated for Appendix B parameters at the compliance wells to assess whether SSLs of Appendix B parameters were present above the GWPS. SSLs were identified for barium, combined radium, fluoride, and lithium. Therefore, either the unit will move to an assessment of corrective measures, or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

## 2. BOTTOM ASH POND EVALUATION

### 2.1 Data Validation and QA/QC

During the October 2025 assessment monitoring event, one set of samples was collected for analysis from each background and compliance well to meet the requirements of OAC 252:517-9-6(d)(1). Samples from the October 2025 sampling event were analyzed for all Appendix A and Appendix B parameters. A summary of data collected during this assessment monitoring event are presented in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program–certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.10.1.03a statistics software. The export file was checked against the analytical data for transcription errors and completeness.

### 2.2 Statistical Analysis

Statistical analyses for the BAP were conducted in accordance with the November 2021 *Statistical Analysis Plan* (Geosyntec 2021). Time series plots and results for all completed statistical tests are provided in Attachment B. The data obtained in October 2025 were screened for potential outliers. No outliers were identified for this event. Previously reported values for combined radium and lithium at background well SP-5R were identified as outliers based on a visual review of the data and removed from the dataset to represent current groundwater quality.

#### 2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix B parameter in accordance with the Statistical Analysis Plan (Geosyntec 2021). The established GWPS was set to whichever was greater of the background concentration and the maximum contaminant level for each Appendix B parameter. To determine background concentrations, an upper tolerance limit was calculated using data that were pooled from the background wells collected during the background monitoring and assessment monitoring events. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for antimony, cadmium, cobalt, and lead. Nonparametric tolerance limits were calculated for arsenic, barium, beryllium, chromium, combined radium, fluoride, lithium, molybdenum, and selenium due to apparent nonnormal distributions, and for mercury and thallium due to a high nondetect frequency. Upper tolerance limits and the final GWPSs are summarized in Table 2.

#### 2.2.2 Evaluation of Potential Appendix B SSLs

A confidence interval was constructed for each Appendix B parameter at each compliance well. Confidence limits were generally calculated parametrically ( $\alpha = 0.01$ ). However, nonparametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally

distributed or when the nondetect frequency was too high). Select datasets were truncated if significant serial correlation was observed among the background samples that were collected on an approximately monthly basis in 2017. The datasets for barium and combined radium at SP-10 were also truncated as higher concentrations were observed in more recent samples compared to the initial results. A list of the truncated well/constituent pairs used for calculation of the confidence limits is provided in Attachment B.

An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval was above the GWPS). Calculated confidence limits are shown in Attachment B.

The following SSLs were identified at the Northeastern BAP:

- The LCL for barium was above the GWPS of 2.77 milligrams per liter (mg/L) at SP-10 (4.60 mg/L).
- The LCL for combined radium was above the GWPS of 16.2 mg/L at SP-10 (18.8 mg/L).
- The LCL for fluoride was above the GWPS of 4.39 mg/L at SP-10 (6.29 mg/L).
- The LCL for lithium was above the GWPS of 0.123 mg/L at SP-10 (0.234 mg/L).

### 2.2.3 Establishment of Appendix A Prediction Limits

Upper prediction limits (UPLs) were previously established for all Appendix A parameters following the background monitoring period. Interwell tests were used to evaluate potential SSIs for boron, chloride, fluoride, pH, sulfate, and TDS, and intrawell tests were used to evaluate potential SSIs for calcium. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data become available.

For intrawell tests, insufficient data was available to compare against the existing background dataset, and so the prediction limits were not updated for the intrawell tests at this time. The intrawell prediction limits were previously calculated using historical data through April 2024 (Geosyntec 2025b). The established intrawell prediction limits were used to evaluate the potential SSIs for calcium.

Prediction limits for the interwell tests were recalculated using data collected during the 2025 assessment monitoring events. New background well data were tested for outliers before being added to the background data set. Background well data were also evaluated for statistically significant trends using the Sen's Slope/Mann-Kendall trend test, and the results are included in Attachment B.

After the revised background set was established, a parametric or nonparametric analysis was selected based on the distribution of the data and the frequency of nondetect data. Estimated results under the reporting limit (i.e., practical quantitation limit [PQL]) but above the method detection limit—that is, “J-flagged” data—were considered detections and the estimated results were used in the statistical analyses. Nonparametric analyses were selected for data sets with at least 50% nondetect data or data sets that could not be normalized. Parametric analyses were selected for

data sets (either transformed or untransformed) that passed the Shapiro-Wilk/Shapiro-Francia test for normality. The Kaplan-Meier nondetect adjustment was applied to data sets with between 15% and 50% nondetect data. For data sets with fewer than 15% nondetect data, nondetect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or nonparametric) and transformation (where applicable) for each background data set are shown in Attachment B.

Interwell UPLs were updated for boron, chloride, fluoride, pH, sulfate, and TDS and interwell LPLs were updated for pH using historical data through October 2025. Intrawell UPLs for calcium were previously updated using data through April 2024 to represent background values. The prediction limits are summarized in Table 3. The prediction limits were calculated for a one-of-two retesting procedure: If at least one sample in a series of two is not above the UPL (or, in the case of pH, is neither less than the LPL nor greater than the UPL), then it can be concluded that an SSI has not occurred. In practice, where the initial result does not exceed the UPL (or, in the case of pH, is neither less than the LPL nor greater than the UPL), a second sample will not be collected. The retesting procedures allow achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

#### 2.2.4 Evaluation of Potential Appendix A SSIs

While SSLs were identified, a review of the Appendix A results were also completed to assess whether concentrations of Appendix A parameters at the compliance wells were above background concentrations. Data collected during the October 2025 assessment monitoring event from each compliance well were compared to updated interwell and previously updated intrawell prediction limits to assess whether the results are above background values (Table 3).

The following concentrations were above the UPLs:

- The boron concentration was above the interwell UPL of 0.491 mg/L at SP-10 (1.01 mg/L).
- The chloride concentration was above the interwell UPL of 1,010 mg/L at SP-10 (1,860 mg/L).
- The fluoride concentration was above the interwell UPL of 4.39 mg/L at SP-10 (7.1 mg/L).
- The TDS concentration was above the interwell UPL of 1,940 mg/L at SP-10 (3,440 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the October 2025 sample was above the UPL or, in the case of pH, below the LPL.

### 2.3 Conclusions

A semiannual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified no potential outliers in the October 2025 data. GWPSs were reestablished for the Appendix B parameters. A confidence interval was constructed at each compliance well for each Appendix B parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for barium,

combined radium, fluoride, and lithium. Appendix A parameters were compared to calculated prediction limits, with exceedances identified for boron, chloride, fluoride, and TDS.

Based on this evaluation, the Northeastern BAP CCR unit will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

### 3. REFERENCES

Geosyntec. 2021. Statistical Analysis Plan – Northeastern Power Station. Geosyntec Consultants, Inc. November.

Geosyntec. 2025a. Statistical Analysis Summary, 2025 1<sup>st</sup> Semiannual Event – Bottom Ash Pond, Northeastern Power Station, Oologah, Oklahoma. Geosyntec Consultants, Inc. October.

Geosyntec. 2025b. Statistical Analysis Summary, 2024 2<sup>nd</sup> Semiannual Event – Bottom Ash Pond, Northeastern Power Station, Oologah, Oklahoma. Geosyntec Consultants, Inc. February.

Geosyntec. 2026. Alternative Source Demonstration Update. Northeastern Power Station, Bottom Ash Pond, Oologah, Oklahoma. Geosyntec Consultants, Inc. January.

# TABLES

**Table 1. Groundwater Data Summary  
Statistical Analysis Summary  
Northeastern Plant – Bottom Ash Pond**

*Geosyntec Consultants, Inc.*

Parameter	Units	SP-1	SP-10	SP-11	SP-2	SP-4	SP-5R
		10/27/2025	10/27/2025	10/27/2025	10/27/2025	10/28/2025	10/28/2025
Antimony	µg/L	0.3 J1	1 U1	0.2 J1	0.8	0.3 J1	0.1 J1
Arsenic	µg/L	0.5	1 U1	2.4	1.5	1.6	20.7
Barium	µg/L	117	6620	807	1120	205	2200
Beryllium	µg/L	0.3 U1	0.5 U1	0.3 U1	0.1 J1	0.2 J1	0.3 U1
Boron	mg/L	0.20 J1	1.01	0.25	0.14 J1	0.38	0.23 J1
Cadmium	µg/L	0.04 J1	0.2 U1	0.05 J1	0.05 J1	0.06 J1	0.1 U1
Calcium	mg/L	107	137	71.6	121	105	85.6
Chloride	mg/L	47.2	1860	73.5	883	432	739
Chromium	µg/L	0.6 J1	3 U1	1.4 J1	0.8 J1	1.1 J1	1.0 J1
Cobalt	µg/L	0.38	0.3 U1	0.83	0.71	0.75	0.61
Combined Radium	pCi/L	4.40 J1	19.70 J1, R2	1.17 J1	5.67	3.13 J1	11.39
Fluoride	mg/L	1.09	7.1	2.87	3.23	3.43	3.36
Lead	µg/L	0.3 J1	0.6 J1	1.3	0.6 J1	0.7 J1	1.7
Lithium	mg/L	0.0051	0.225	0.0268	0.0474	0.0585	0.0962
Mercury	µg/L	0.038	0.005 U1	0.05 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	11.0	5 U1	1.0 J1	11.0	2.9	0.7 J1
pH	SU	7.87	7.88	7.91	7.74	8.04	8.14
Selenium	µg/L	3.1	5 U1	0.3 J1	2.7	0.9 J1	0.2 J1
Sulfate	mg/L	83.1	19.0	53.6	11.3	92.9	2.0
Thallium	µg/L	0.1 J1	2 U1	1 U1	0.1 J1	0.1 J1	1 U1
Total Dissolved Solids	mg/L	490	3440	660	1820	1120	1460

Notes:

J1: estimated value. Parameter was detected in concentrations below the reporting limit.

mg/L: milligrams per liter

pCi/L: picocuries per liter

R2: radium-226 carrier recovery outside of acceptance limits.

SU: standard unit

U1: non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

µg/L: micrograms per liter

**Table 2. Appendix B Groundwater Protection Standards  
Statistical Analysis Summary  
Northeastern Plant – Bottom Ash Pond**

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.00342	0.00600
Arsenic, Total (mg/L)	0.0100		0.0599	0.0599
Barium, Total (mg/L)	2.00		2.77	2.77
Beryllium, Total (mg/L)	0.00400		0.00212	0.00400
Cadmium, Total (mg/L)	0.00500		0.000132	0.00500
Chromium, Total (mg/L)	0.100		0.00571	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00175	0.00600
Combined Radium, Total (pCi/L)	5.00		16.2	16.2
Fluoride, Total (mg/L)	4.00		4.39	4.39
Lead, Total (mg/L)	n/a	0.0150	0.00803	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.123	0.123
Mercury, Total (mg/L)	0.00200		0.0000300	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.0100	0.100
Selenium, Total (mg/L)	0.0500		0.00499	0.0500
Thallium, Total (mg/L)	0.00200		0.00162	0.00200

Notes:

1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.

CCR: coal combustion residuals

GWPS: groundwater protection standard

MCL: maximum contaminant level

mg/L: milligrams per liter

n/a: not applicable

pCi/L: picocuries per liter

**Table 3. Appendix A Data Summary  
Statistical Analysis Summary  
Northeastern – Bottom Ash Pond**

Analyte	Unit	Description	SP-1	SP-2	SP-10	SP-11
			10/27/2025	10/27/2025	10/27/2025	10/27/2025
Boron	mg/L	Interwell Background Value (UPL)	0.491			
		Analytical Result	0.20	0.14	<b>1.01</b>	0.25
Calcium	mg/L	Intrawell Background Value (UPL)	139	172	177	146
		Analytical Result	107	121	137	71.6
Chloride	mg/L	Interwell Background Value (UPL)	1,010			
		Analytical Result	47.2	883	<b>1,860</b>	73.5
Fluoride	mg/L	Interwell Background Value (UPL)	4.39			
		Analytical Result	1.09	3.23	<b>7.1</b>	2.87
pH	SU	Interwell Background Value (UPL)	9.1			
		Interwell Background Value (LPL)	7.0			
		Analytical Result	7.9	7.7	7.9	7.9
Sulfate	mg/L	Interwell Background Value (UPL)	92.9			
		Analytical Result	83.1	11.3	19.0	53.6
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	1,940			
		Analytical Result	490	1,820	<b>3,440</b>	660

Notes:

**1. Bold values exceed the background value.**

2. Background values are shaded gray.

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

# ATTACHMENT A

## Certification by Qualified Professional Engineer

**Certification by Qualified Professional Engineer**

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Northeastern BAP CCR management area and that the requirements of OAC 252:517-9-4(g) have been met.

**David Anthony Miller**

Printed Name of Licensed Professional Engineer

*David Anthony Miller*

Signature



**26057**

License Number

**Oklahoma**

Licensing State

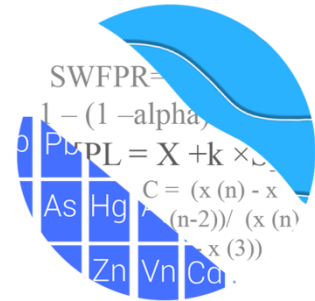
**02.23.2026**

Date

# **ATTACHMENT B**

## Statistical Analysis Output

# GROUNDWATER STATS CONSULTING



February 23, 2026

Geosyntec Consultants  
Attn: Ms. Allison Kreinberg  
500 W. Wilson Bridge Road, Suite 250  
Worthington, OH 43085

Re: Northeastern BAP (Bottom Ash Pond)  
Background Update & Assessment Monitoring Statistics – October 2025

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis and background update of 2025 groundwater data for American Electric Power Inc.'s Northeastern BAP. The analysis complies with the Oklahoma Administrative Code (OAC) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the OAC program in 2017. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** SP-4 and SP-5R
- **Downgradient wells:** SP-1, SP-2, SP-10, and SP-11

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. The statistical analysis was reviewed by Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to Groundwater Stats Consulting.

The OAC program consists of the following constituents listed below. The terms “constituent” and “parameter” are interchangeable.

- **Appendix A** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS
- **Appendix B** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series and box plots are provided for all wells for the parameters listed above (Figures A & B). The time series plots display concentrations over time for each well while the box plots provide visual representation of variation within a given well and across all wells.

For all constituents, a substitution of the most recent reporting limit is used for non-detect data. In some cases, the reporting limit provided by the laboratory contains varying limits for a given parameter; therefore, the substitution may differ from well to well. Reporting limit changes may occur depending on laboratory capabilities. The computed statistical limits, both background and compliance limits, were not adversely affected by these substitutions.

### **Summary of Statistical Methods**

- Intrawell prediction limits, combined with a 1-of-2 resample plan for calcium
- Interwell prediction limits combined with a 1-of-2 resample plan for boron, chloride, fluoride, pH, sulfate, and TDS
- Confidence intervals compared to Ground Water Protection Standards (GWPS) for all Appendix IV constituents

Assessment monitoring for Appendix IV parameters involves the comparison of a confidence interval for each parameter at downgradient wells against the corresponding GWPS. The GWPS is determined for each parameter as the highest limit of the Maximum Contaminant Levels (MCLs) or background limits determined from tolerance limits constructed from pooled upgradient well data.

Prior to computing tolerance limits on upgradient well data or confidence intervals on downgradient well data, the distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-

parametric tolerance limits and confidence intervals as appropriate, based on the following criteria.

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits and confidence intervals are used on data containing greater than 50% non-detects or data sets which do not follow a normal or transformed-normal distribution.

For Appendix A detection monitoring parameters, compliance is determined by comparing the most recent observation to a background prediction limit. The corresponding trend tests for screening and evaluating prediction limit exceedances of Appendix A parameters are performed at the 99% confidence level to provide a high level of confidence against false positives. For Appendix B assessment monitoring parameters, however, compliance is assessed by comparing a full (or truncated) period of record to a GWPS using a confidence interval. The corresponding trend tests for screening and evaluating confidence interval exceedances of Appendix B constituents are performed at the 95% confidence level to provide greater capability of identifying potential trends than the 99% confidence level.

## **Summary of Previous Background Updates**

### **December 2017 – Initial Background Screening**

Interwell prediction limits combined with a 1-of-2 verification strategy were recommended for boron, chloride, fluoride, pH, sulfate and TDS; and intrawell prediction limits combined with a 1-of-2 verification strategy were recommended for calcium. All proposed background data were screened for outliers and trends during the background screening. The findings of those reports were submitted with that analysis. Interwell prediction limits utilize all upgradient well data for construction of statistical limits. During each sample event, upgradient well data may be screened for any newly suspected outliers or obvious trending patterns using time series plots. Intrawell

prediction limits utilized the background data set that was originally screened in 2017. As recommended in the EPA Unified Guidance (2009), the background data sets are evaluated for the purpose of updating statistical limits, as described below, using the Mann-Whitney test when at least four additional measurements are available.

## 2022 & 2023 Updates

Proposed background data, as mentioned above, were originally screened during December 2017. In the Fall 2022 update, an outlier analysis was conducted on calcium, which is evaluated with intrawell prediction limits, using Tukey's outlier test and visual screening via time series graphs on data through June 2022 at all wells. The analysis did not identify any outliers for calcium, and therefore, no values were flagged.

The Mann-Whitney test of medians was used to evaluate the medians of historical data through August 2020 with the medians of compliance samples through June 2022 at each well for calcium. A statistically significant difference was identified between the medians at well SP-1, but this record was updated since most compliance data were within the range of earlier concentrations. Additionally, while no significant difference between the medians was detected for calcium at well SP-11, the earlier elevated concentrations for this well/constituent pair were truncated to use more recent and stable concentrations for construction of an intrawell prediction limit to reflect current groundwater quality. All calcium data sets were updated with compliance samples through June 2022.

Note that during the Fall 2022 update, the Rank Von Neumann serial correlation test was used to evaluate whether the measurements collected during 2017 represented independent samples, or whether serial correlation was present among the measurements. Significant serial correlation was identified for the following Appendix A and B well/constituent pairs.

- Barium: SP-4 (upgradient) and SP-11
- Calcium: SP-4 (upgradient)
- Cadmium: SP-4, SP-5R (both upgradient), SP-1, and SP-10
- Chromium: SP-4 (upgradient)
- Lead: SP-10
- Lithium: SP-4 (upgradient) and SP-11
- Molybdenum: SP-2
- Selenium: SP-5R (upgradient) and SP-2
- Sulfate: SP-4 and SP-5R (both upgradient)
- Thallium: SP-4, SP-5R (both upgradient), SP-1, SP-2, SP-10, and SP-11

Therefore, the records for these well/constituent pairs were truncated to remove earlier measurements for construction of statistical limits using only more recent data that represent independent samples. The truncated observations appear as disconnected points on the time series plots, and the truncated records are listed in the Date Range Table.

In the Fall 2023 update, pooled upgradient well data were evaluated using Tukey's outlier test and visual screening via time series graphs for Appendix A constituents evaluated with interwell prediction limits (boron, chloride, fluoride, pH, sulfate, and TDS). Any values identified by Tukey's but not flagged appeared representative of variation in groundwater quality that is unrelated to practices at the facility and result in statistical limits that are representative of near-term and potentially future background. Previously flagged outliers were confirmed by Tukey's test and visual screening, and no changes to values flagged in previous background updates were made.

For boron, chloride, fluoride, pH, sulfate, and TDS, the Sen's Slope/Mann-Kendall trend test was used to assess statistically significant trends at upgradient wells. Significant increasing trends were identified for chloride at well SP-5R, sulfate at well SP-4, and TDS at well SP-5R; and decreasing trends were observed for boron at wells SP-4 and SP-5R. No data records among upgradient wells were adjusted as truncating the earlier portions of the records would have little or no impact on resulting statistical limits. Interwell prediction limits were updated using all available data from upgradient wells through October 2023 for boron, chloride, fluoride, pH, sulfate, and TDS.

## **2024 Update**

Tukey's outlier test and visual screening via time series graphs were used to assess data at all wells through April 2024 for calcium, which is evaluated with intrawell prediction limits, and on pooled upgradient well data through October 2024 for boron, chloride, fluoride, pH, sulfate, and TDS, which are tested using interwell prediction limits, in addition to Appendix B parameters.

For calcium, Tukey's outlier test and visual screening did not identify any outliers; therefore, no values were flagged.

Tukey's outlier test and visual screening on pooled upgradient well data confirmed previously identified values for Appendix A parameters which use interwell methods and for all Appendix B parameters, but no additional values were flagged and no changes were made to previously flagged values. Any values identified by Tukey's but not flagged appeared representative of variation in groundwater quality conditions unrelated to

practices at the facility, and in the case of Appendix B were lower than the respective MCL. A summary table of all flagged outliers was included with that background update.

The Mann-Whitney test of medians was applied to compare earlier data through June 2022 to the medians of new compliance samples through April 2024 at each well for calcium. While a statistically significant difference was identified for calcium between the medians at well SP-5R, this record was updated since this is an upgradient well and all reported concentrations were either within or slightly lower than the range of background observations earlier in the respective record. The records for calcium at all wells were updated with compliance samples through April 2024.

For Appendix A parameters tested using interwell methods (boron, chloride, fluoride, pH, sulfate, and TDS), the Sen's Slope/Mann-Kendall trend test was used to detect statistically significant trends at upgradient wells. Although statistically significant trends were identified, no records were adjusted as truncating the earlier portions of the records would have little or no impact on resulting statistical limits.

For Appendix B parameters, visual screening confirmed previously flagged high values for arsenic, beryllium, cobalt, lead, and mercury at upgradient well SP-4 on 8/4/17. Among downgradient wells, a high value for combined radium 226 + 228 in well SP-1 was flagged as an outlier along with values for the following well/constituent pairs since the measurements did not adequately represent the populations at their respective wells: chromium in well SP-10; combined radium 226 + 228 in well SP-11; lithium in well SP-1; and molybdenum in well SP-10.

### **Fall 2025 – Current Update**

During this analysis, Tukey's outlier test and visual screening via time series graphs were used to evaluate pooled upgradient well data through October 2025 for boron, chloride, fluoride, pH, sulfate, and TDS, which are tested using interwell prediction limits (Figure C). For parameters (calcium) which use intrawell prediction limits, values were not re-evaluated for new outliers as these records had insufficient samples for updating background limits during this evaluation period.

As mentioned above, significant serial correlation was identified for calcium at upgradient well SP-4 and sulfate at upgradient wells SP-4 and SP-5R; therefore, the records for these well/constituent pairs remain truncated for construction of statistical limits, using only more recent data that represent independent samples. The truncated observations appear as disconnected points on the time series plots, and the truncated records are listed in the Date Range Table.

## Outlier Analysis

Tukey's outlier test and visual screening on pooled upgradient well data confirmed previously identified values for chloride, fluoride, and TDS, but no additional values were flagged, and no changes were made to previously flagged values. Any values identified by Tukey's test but not flagged appeared to be representative of variation in groundwater quality that is unrelated to practices at the facility and result in statistical limits that are representative of near-term and potentially future background. As mentioned above, any flagged data are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages. A summary table of all flagged outliers follows this report (Figure C).

## Trend Test Evaluation

For parameters tested using interwell prediction limits (boron, chloride, fluoride, pH, sulfate, and TDS), the Sen's Slope/Mann-Kendall trend test was used to evaluate data at upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable at the 99% confidence level (Figure D). Statistically significant trends were identified for the following upgradient well/constituent pairs:

Increasing:

- Chloride: SP-5R
- Sulfate: SP-4
- TDS: SP-5R

Decreasing:

- Boron: SP-4 and SP-5R

While identifying these upgradient trends is useful for understanding and characterization of upgradient background groundwater quality, truncation of the records to remove the trend may be appropriate when the trend would result in statistical limits that are not representative of background groundwater quality that might be expected at unimpacted downgradient wells and/or not able to adequately detect downgradient changes that result from the facility. Deselecting data at upgradient wells is done with caution as similar observations may be observed at one or more downgradient wells in the future, depending on transport times.

Although statistically significant trends were identified, no records were adjusted because truncating the earlier measurements from these records to reduce the influence of the trend would have little to no impact on resulting interwell prediction limits or observations within these individual wells fall within the range of concentrations found among the

other upgradient well. All available data from upgradient wells were used to construct interwell prediction limits for boron, chloride, fluoride, pH, sulfate, and TDS.

### Intrawell - Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, are constructed using data through April 2024 for calcium at all wells. A summary table of the limits follows this report (Figure E). A list of well/constituent pairs using a truncated portion of their records follows this report (Date Ranges Table). No comparison of compliance data to the prediction limits was performed in this analysis.

### Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells through October 2025 for boron, chloride, fluoride, pH, sulfate, and TDS (Figure F). Time series plots were included with the interwell prediction limit graphs to display concentrations at upgradient wells that were used to construct the statistical limits. No comparison of the October 2025 downgradient well data was performed in this analysis.

## **Evaluation of Appendix B Parameters – October 2025 Event**

Prior to evaluating compliance for Appendix B parameters, background data are screened through visual screening via time series graphs and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated background statistical limits (upper tolerance limits or UTLs). UTLs are compared to established MCLs or CCR-Rule Specified levels as described below, and the higher of the two limits is used as the GWPS for confidence interval comparison among downgradient wells to determine compliance.

### Outlier Analysis

For the current analysis, Tukey's outlier test on pooled upgradient well data identified outliers for fluoride and thallium. Several of the values identified by Tukey's test were either very similar to other upgradient observations that were not flagged or were lower than the respective MCL; therefore, those values were not flagged as outliers. Previously flagged outliers were confirmed by Tukey's test or visual screening via time series graphs. While not identified by Tukey's outlier test, the highest values for combined radium 226 + 228 and lithium in upgradient well SP-5R were identified via time series graphs and flagged as outliers during this analysis. These values early in the record were several

standard deviations above remaining measurements or the mean of pooled upgradient well data and were flagged to construct a statistical limit is representative of current groundwater quality. Should additional measurements of a similar magnitude be observed upgradient of the facility, these observations will be re-evaluated and may be unflagged. A summary of all flagged outliers follows this report (Figure C).

Additionally, downgradient well data through October 2025 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No new outliers among downgradient wells were flagged during this analysis. Previously flagged downgradient well values are included in the outlier summary table.

### Trend Analysis – Upgradient Wells

The Sen’s Slope/Mann Kendall trend test at the 95% confidence level was used to evaluate the entire record of data through October 2025 from upgradient wells for Appendix B parameters utilizing interwell tolerance limits to quantify if concentrations are increasing, decreasing, or stable (Figure G). When statistically significant trends are identified in upgradient wells, the earlier portion of data may require deselection prior to construction of interwell statistical limits if the trending data would result in statistical limits that are not readily capable of detecting changes in downgradient wells. Statistically significant trends were noted in upgradient wells for the following well/constituent pairs:

#### Increasing

- Barium: SP-5R

#### Decreasing

- Antimony: SP-4 and SP-5R
- Arsenic: SP-4
- 
- Barium: SP-4
- Beryllium: SP-4
- Cadmium: SP-4
- Cobalt: SP-4 and SP-5R
- Lead: SP-4 and SP-5R
- Lithium: SP-4 and SP-5R
- Molybdenum: SP-4 and SP-5R
- Selenium: SP-4
- Thallium: SP-4

Note that while the trend tests identified statistically significant decreasing trends for thallium in well SP-4, the slope, which represents the median slope of all the possible pairwise slopes, are displayed on the graph and summary table as zero. The Mann-Kendall slope estimates which represent the median slope of all the possible pairwise slopes, are displayed on the graph and summary table as zero and result from a large number of non-detects that are substituted with the same value.

In most cases, the significant trends did not adversely affect GWPS as concentrations were below established MCLs or overall concentrations for an individual well were below remaining pooled upgradient well data. Exceptions include cobalt at SP-4 and barium and lithium at SP-5R. The earlier portion of the record for cobalt at SP-4 was truncated to exclude observations that are several standard deviations above the mean collected early in the record as well as to construct a statistical limit that is representative of current groundwater quality. Trend tests using both the full and truncated records follow this report at the end of Figure G. Although concentrations for barium and lithium at SP-5R were above the respective MCL or CCR-Rule Specified Levels, truncating earlier portions of these records would have little to no influence on the resulting statistical limits as more recent concentrations are similar to those found earlier in the records and consistent variation is observed throughout each record. Other statistically significant trends were a byproduct of several non-detects in the record. Therefore, no adjustments were required.

### Interwell Upper Tolerance Limits

Upper tolerance limits (UTLs) were used to calculate background limits from pooled upgradient well data through October 2025 for Appendix B parameters (Figure H). Time series plots of the upgradient data from which the limits are calculated follow the table of limits. These limits are updated on an annual basis and will be updated again during the Fall 2026 sample event. Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

### Groundwater Protection Standards

These background limits were compared to the MCLs and CCR Rule-Specified levels as shown in the GWPS table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure I).

## Confidence Intervals

Confidence intervals were constructed on downgradient wells through October 2025 for each of the Appendix B parameters and then compared to the GWPS, i.e., the highest limit of the MCL, CCR Rule-Specified level, or background limit as discussed above. These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix B parameters. Nonparametric confidence intervals were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals depends upon the number samples available.

Note that due to a visually apparent and statistically significant increasing trend for barium and combined radium 226 + 228 at downgradient well SP-10 with more recent concentrations that have stabilized at or above the GWPS, more and relatively stable data were used to construct confidence intervals (USEPA Unified Guidance, 2009, Chapter 7). Trend tests using both the full and truncated records follow this report (Figure J).

Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete graphical results of the confidence intervals follow this letter (Figure K). Exceedances were identified for the following well/constituent pairs:

- Barium: SP-10
- Combined Radium 226 + 228: SP-10
- Fluoride: SP-10
- Lithium: SP-10

## Trend Test Evaluation

When confidence interval exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable at the 95% confidence level (Figure L). Upgradient wells are included in the trend analyses for all parameters found to exceed their confidence intervals in downgradient wells. When similar patterns exist upgradient of the site, it is an indication of variability in groundwater which may be

# Date Ranges

Date: 1/30/2026 2:41 PM

Northeastern BAP Client: Geosyntec Data: Northeastern BAP

**Barium (mg/L)**

SP-10 overall:5/30/2018-10/27/2025

SP-11 overall:5/30/2018-10/27/2025

SP-4 overall:5/30/2018-10/28/2025

**Cadmium (mg/L)**

SP-1 overall:5/30/2018-10/27/2025

SP-10 overall:5/30/2018-10/27/2025

SP-4 overall:5/30/2018-10/28/2025

SP-5R overall:5/30/2018-10/28/2025

**Calcium (mg/L)**

SP-11 background:7/30/2018-4/16/2024

SP-4 overall:5/30/2018-10/28/2025

**Chromium (mg/L)**

SP-4 overall:5/30/2018-10/28/2025

**Cobalt (mg/L)**

SP-4 overall:5/30/2018-10/28/2025

**Combined Radium 226 + 228 (pCi/L)**

SP-10 overall:6/14/2022-10/27/2025

**Lead (mg/L)**

SP-10 overall:5/30/2018-10/27/2025

**Lithium (mg/L)**

SP-11 overall:5/30/2018-10/27/2025

SP-4 overall:5/30/2018-10/28/2025

**Molybdenum (mg/L)**

SP-2 overall:5/30/2018-10/27/2025

**Selenium (mg/L)**

SP-2 overall:5/30/2018-10/27/2025

SP-5R overall:5/30/2018-10/28/2025

**Sulfate (mg/L)**

SP-4 overall:5/30/2018-10/28/2025

SP-5R overall:5/30/2018-10/28/2025

**Thallium (mg/L)**

SP-1 overall:5/30/2018-10/27/2025

SP-10 overall:5/30/2018-10/27/2025

SP-11 overall:5/30/2018-10/27/2025

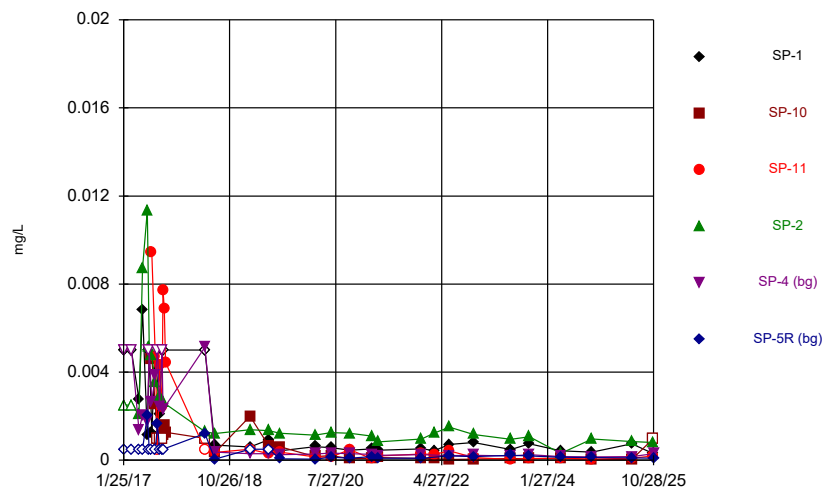
SP-2 overall:5/30/2018-10/27/2025

SP-4 overall:5/30/2018-10/28/2025

SP-5R overall:5/30/2018-10/28/2025

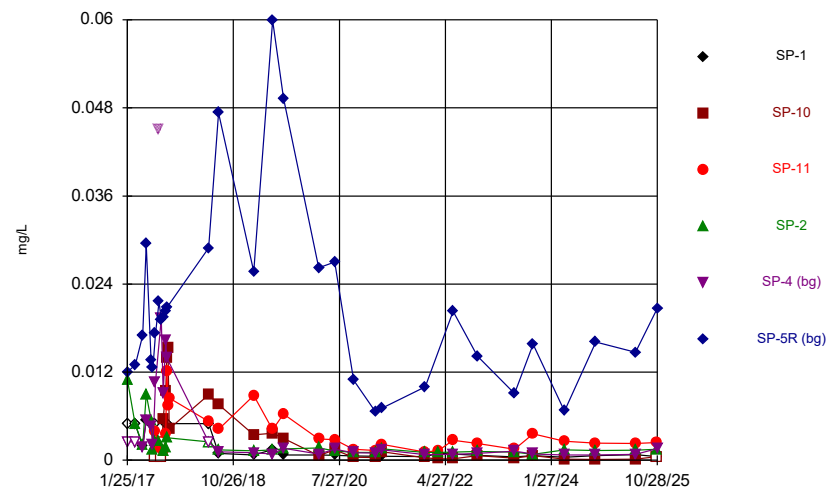
FIGURE A  
Time Series

### Time Series



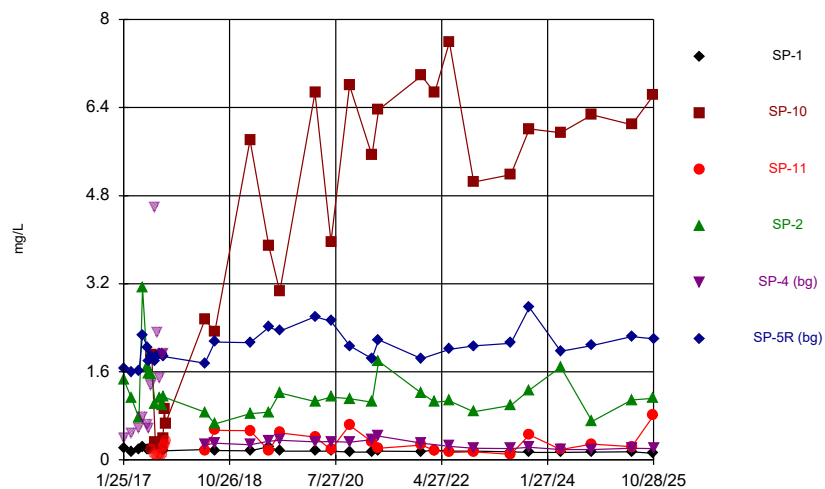
Constituent: Antimony Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



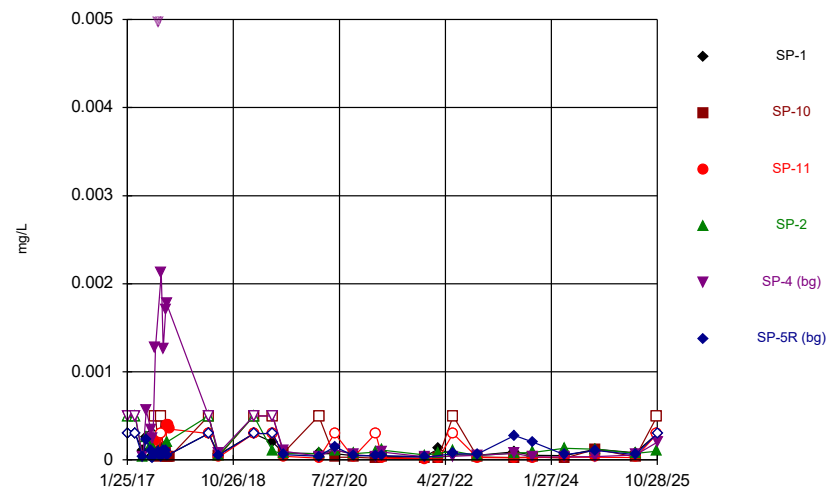
Constituent: Arsenic Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



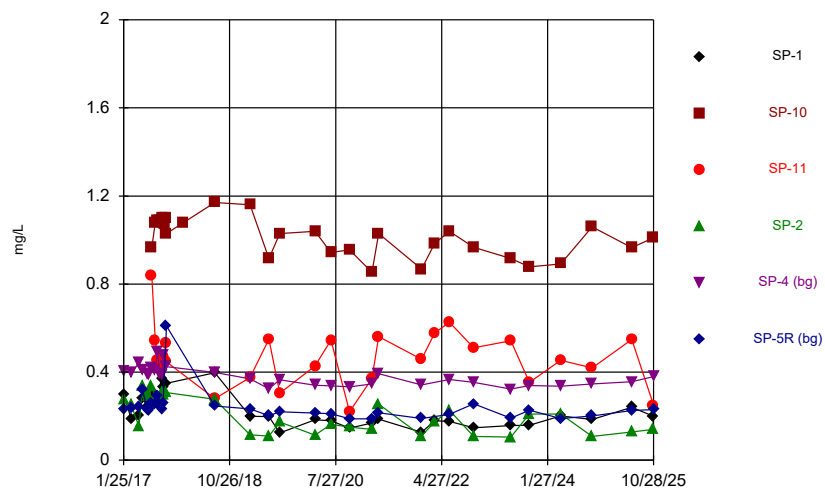
Constituent: Barium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



Constituent: Beryllium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

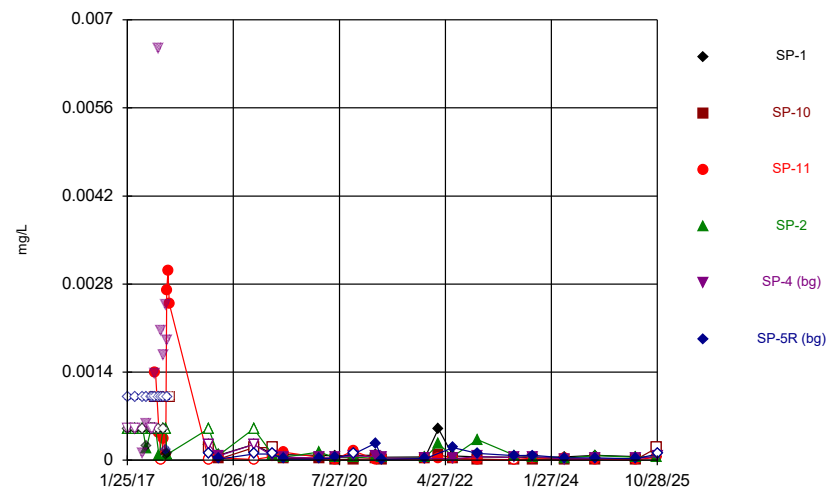
### Time Series



Constituent: Boron Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

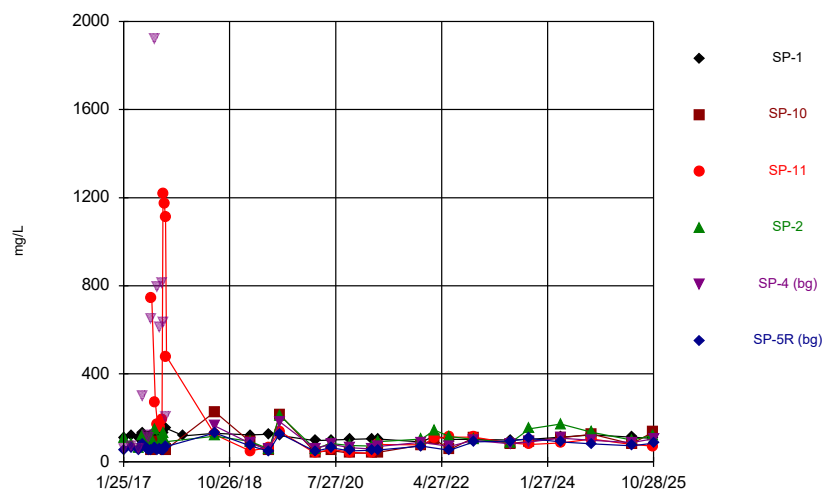
Hollow symbols indicate censored values.

### Time Series



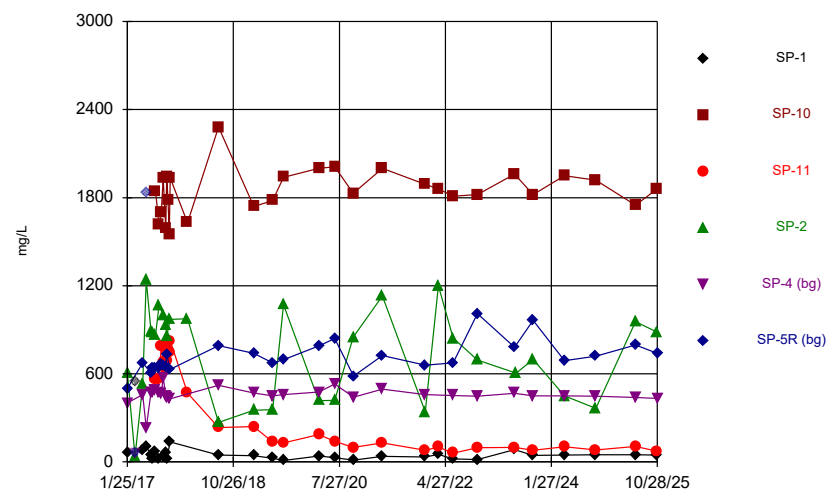
Constituent: Cadmium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



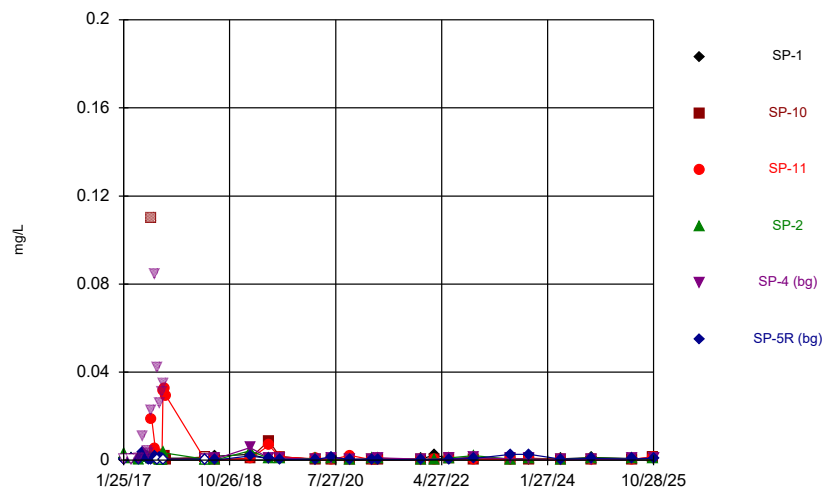
Constituent: Calcium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



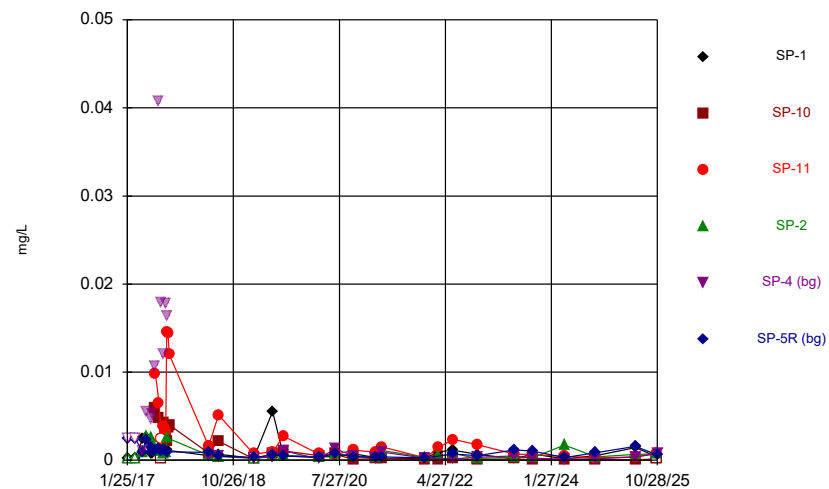
Constituent: Chloride Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



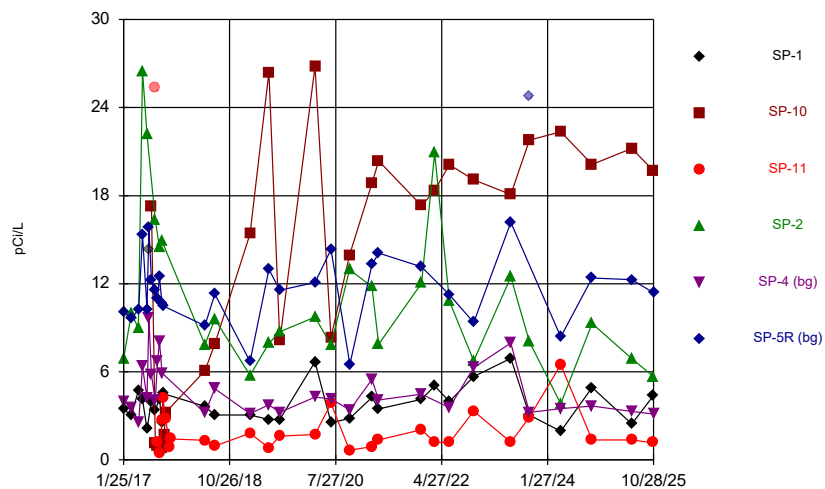
Constituent: Chromium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



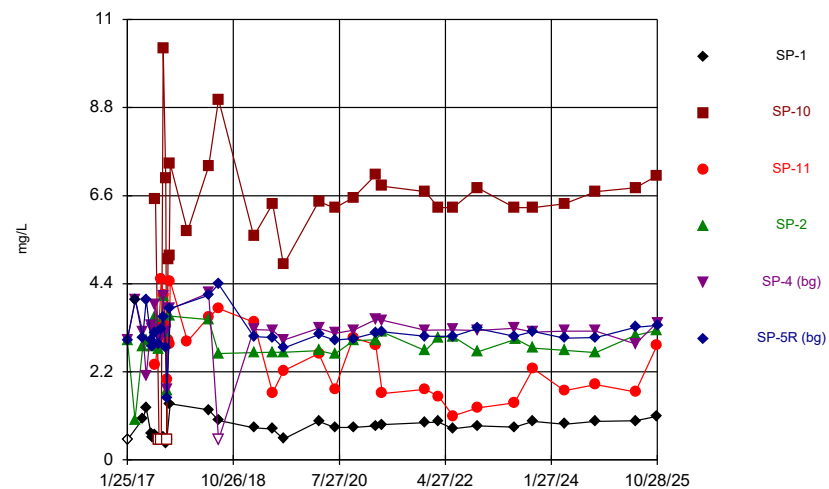
Constituent: Cobalt Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



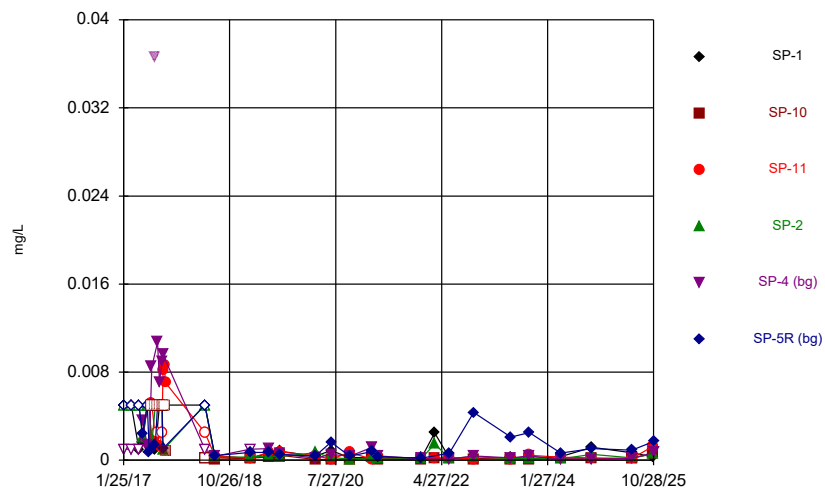
Constituent: Combined Radium 226 + 228 Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



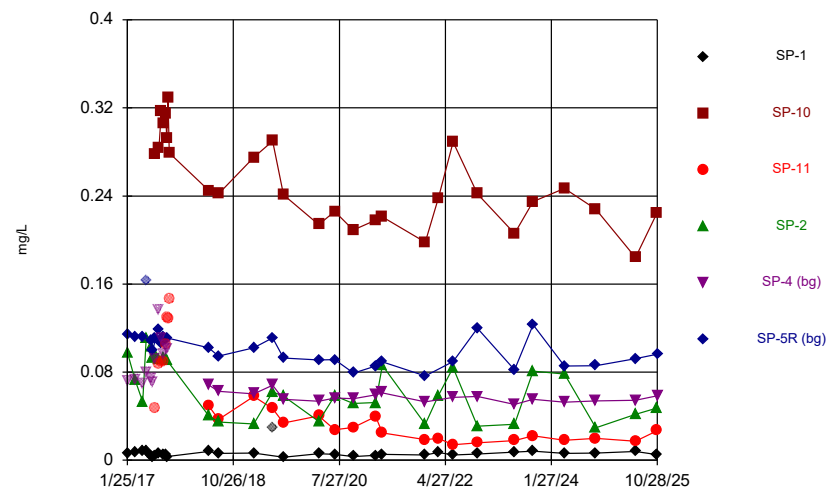
Constituent: Fluoride Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



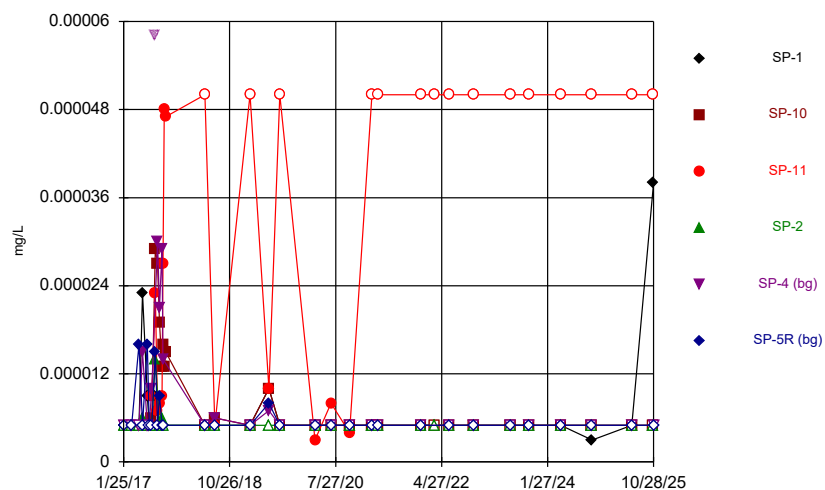
Constituent: Lead Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



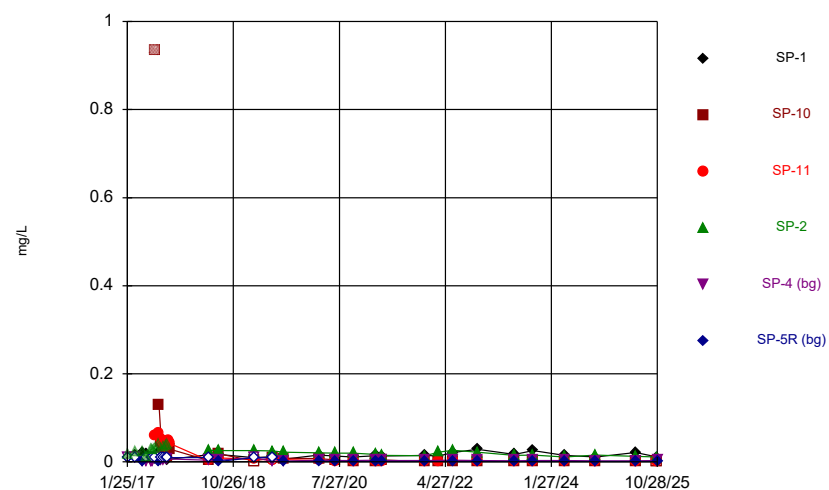
Constituent: Lithium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



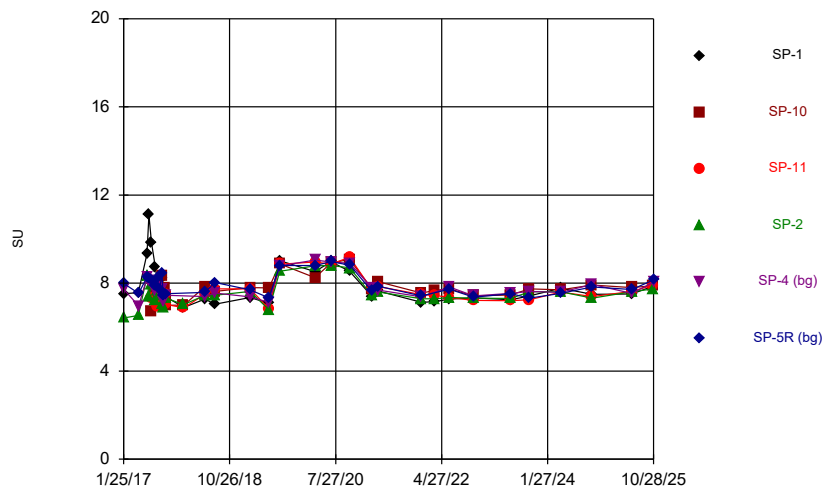
Constituent: Mercury Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Time Series



Constituent: Molybdenum Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

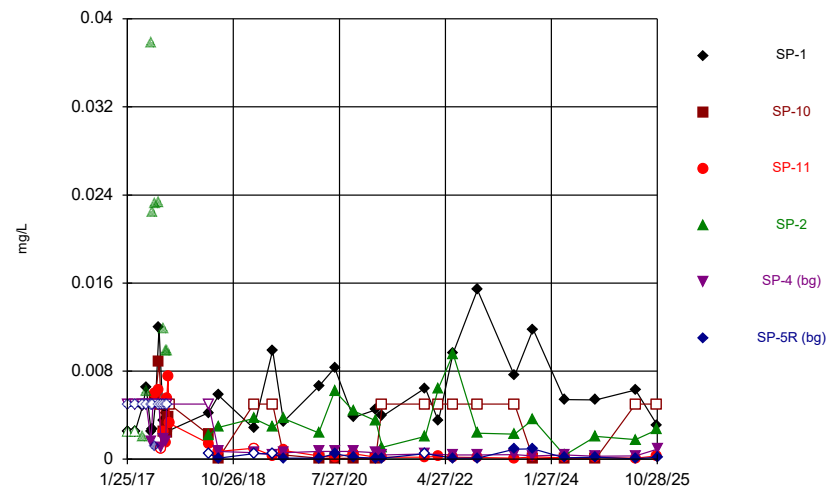
Time Series



Constituent: pH, field Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

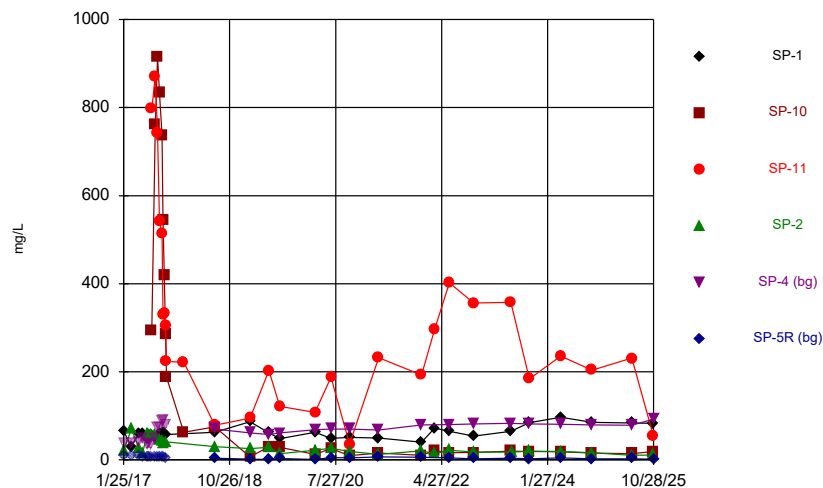
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

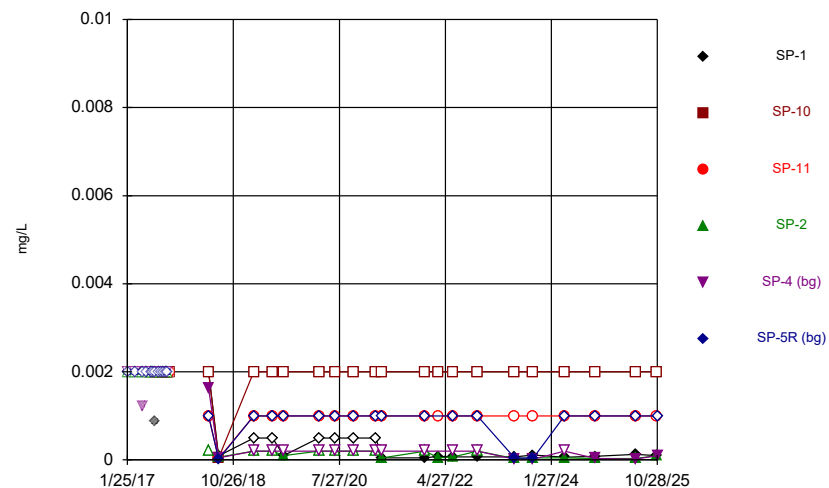
Time Series



Constituent: Sulfate Analysis Run 2/13/2026 1:55 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

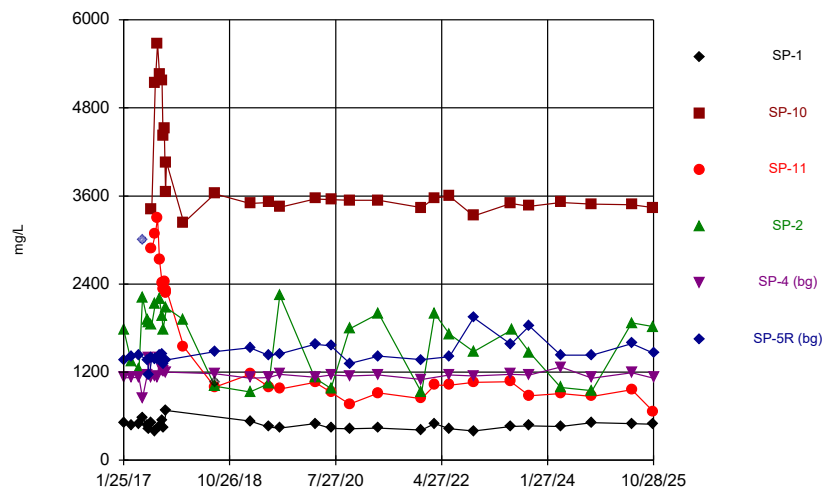
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 2/13/2026 1:56 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

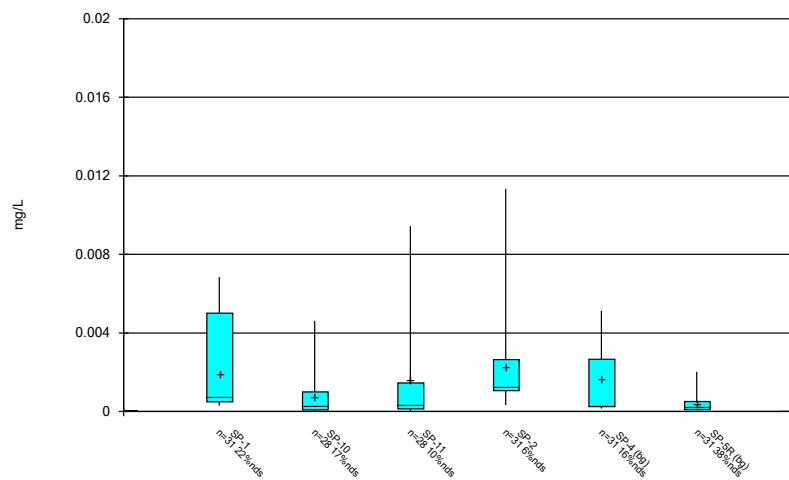
### Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 2/13/2026 1:56 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

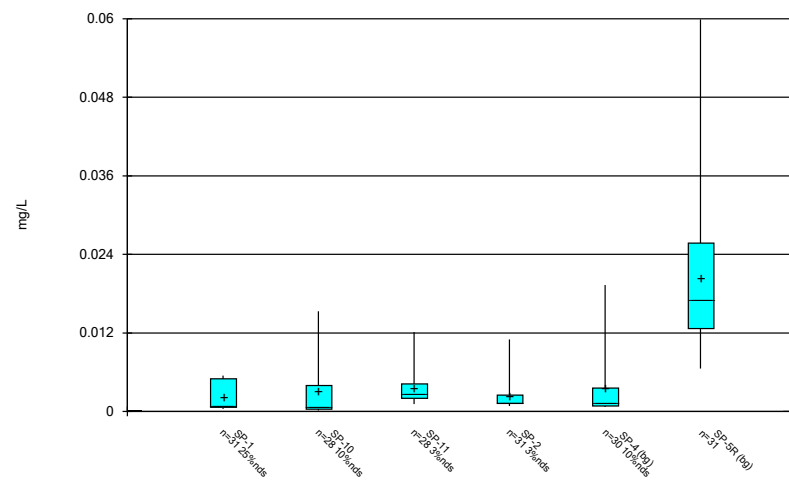
FIGURE B  
Box Plots

Box & Whiskers Plot



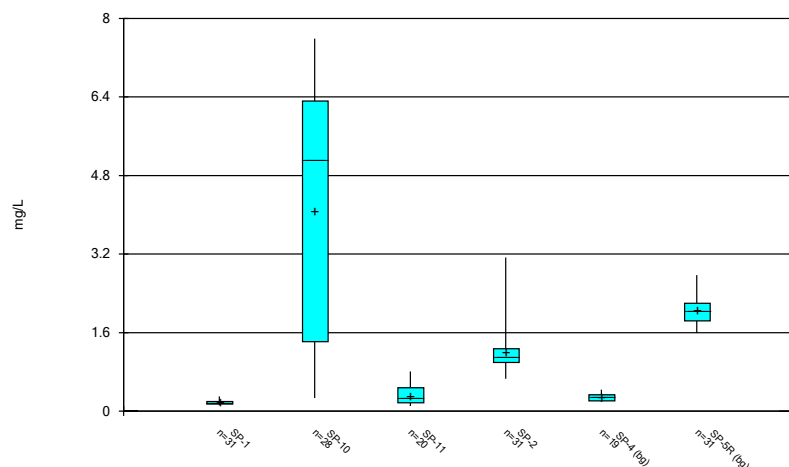
Constituent: Antimony Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



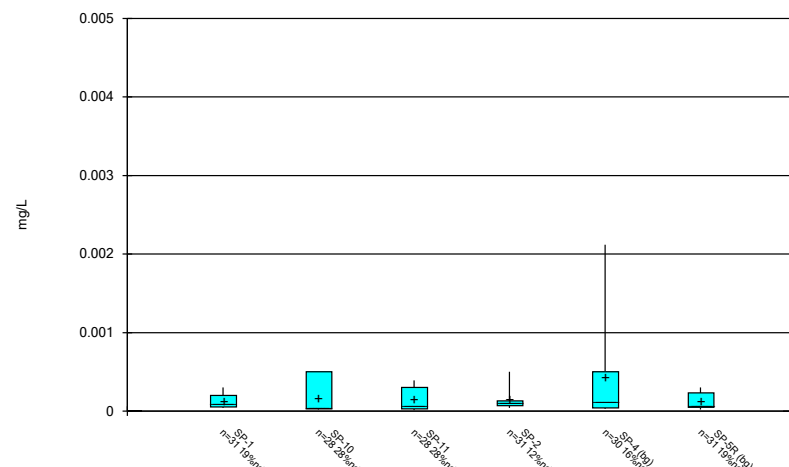
Constituent: Arsenic Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



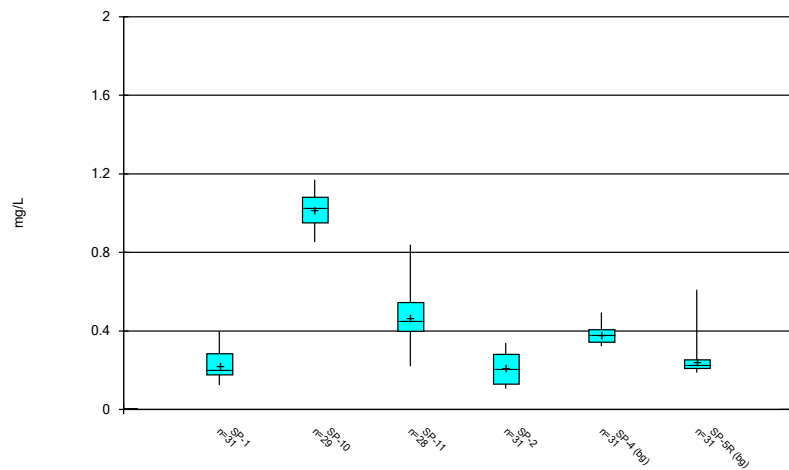
Constituent: Barium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



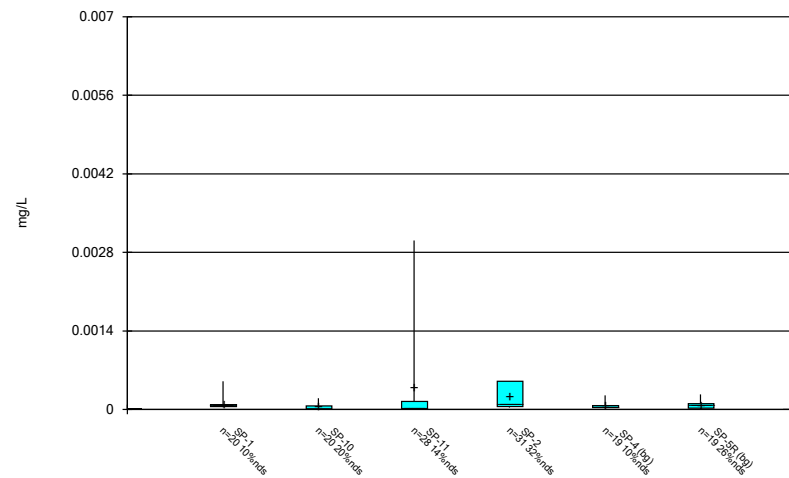
Constituent: Beryllium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



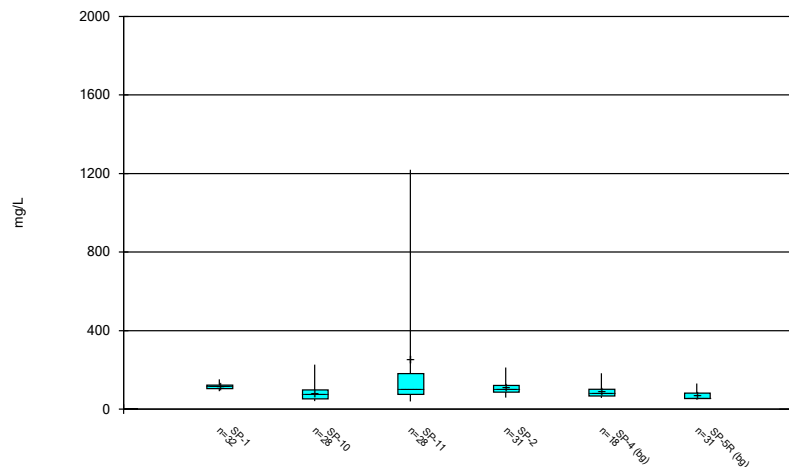
Constituent: Boron Analysis Run 2/13/2026 1:57 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



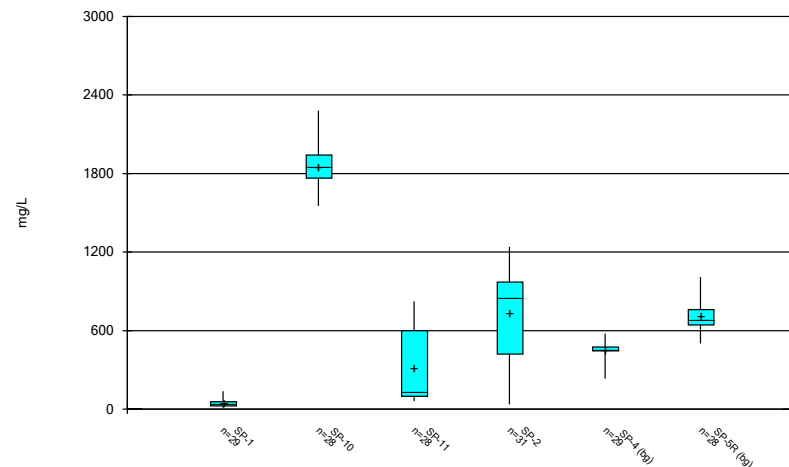
Constituent: Cadmium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



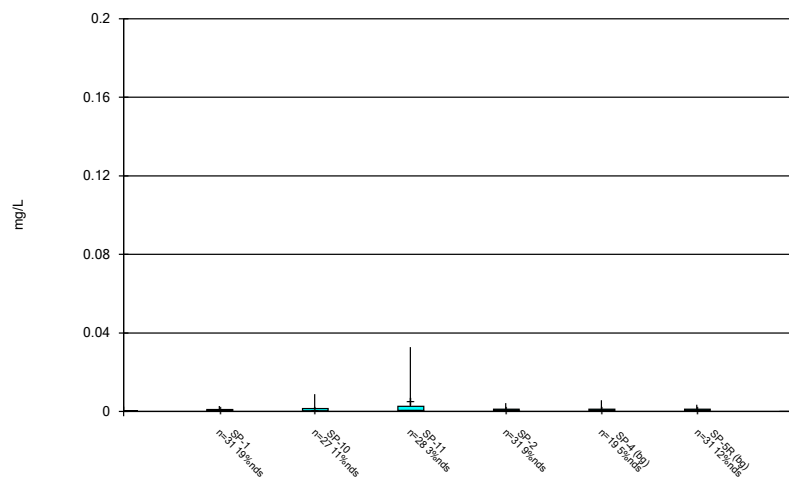
Constituent: Calcium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



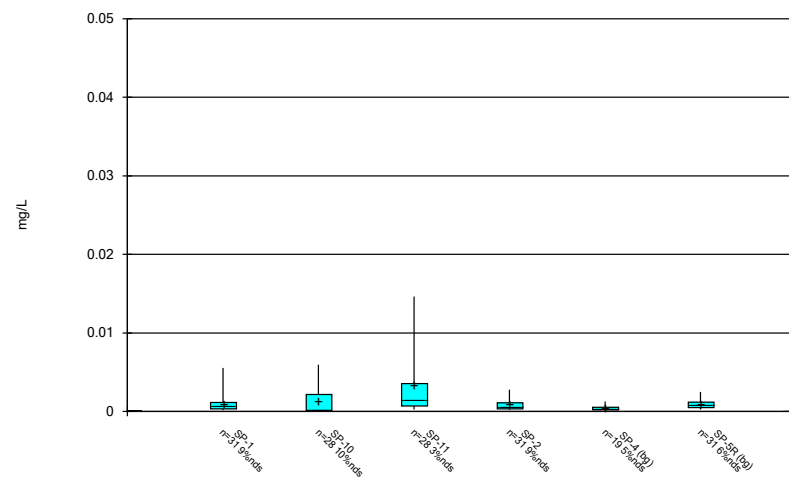
Constituent: Chloride Analysis Run 2/13/2026 1:57 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



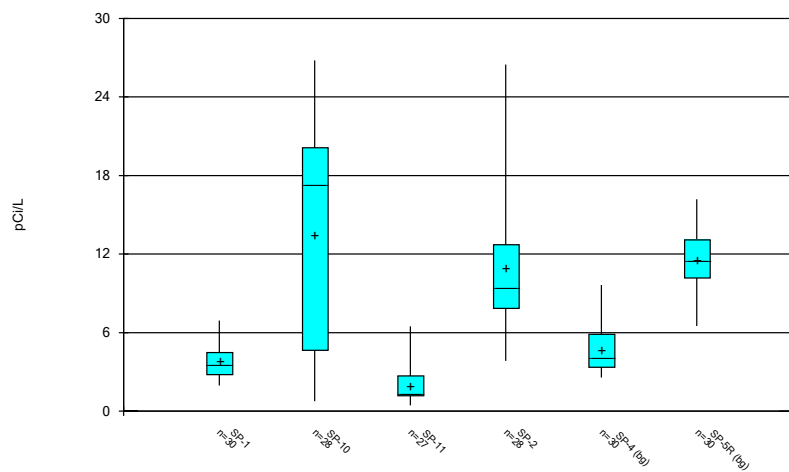
Constituent: Chromium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



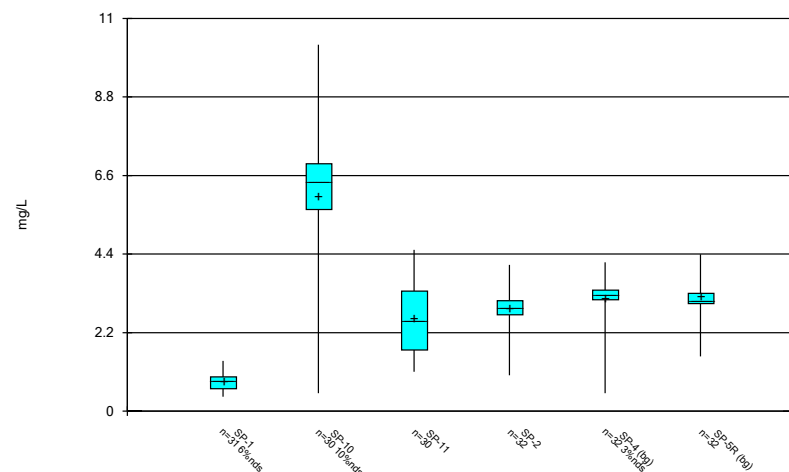
Constituent: Cobalt Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



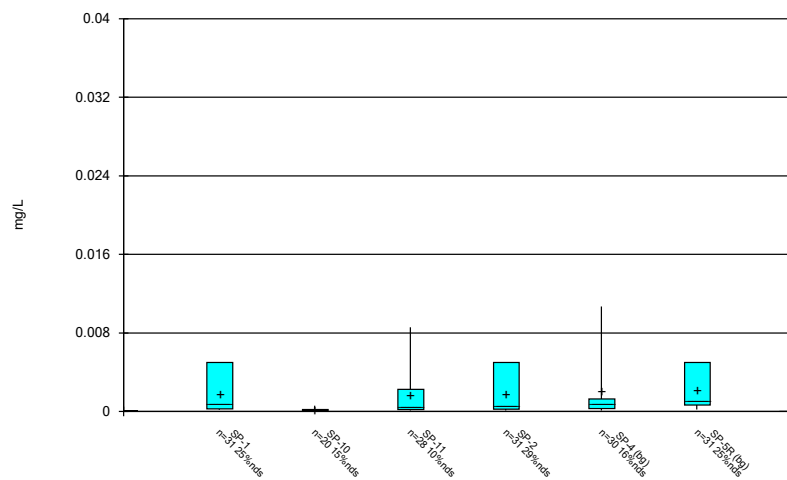
Constituent: Combined Radium 226 + 228 Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Box & Whiskers Plot



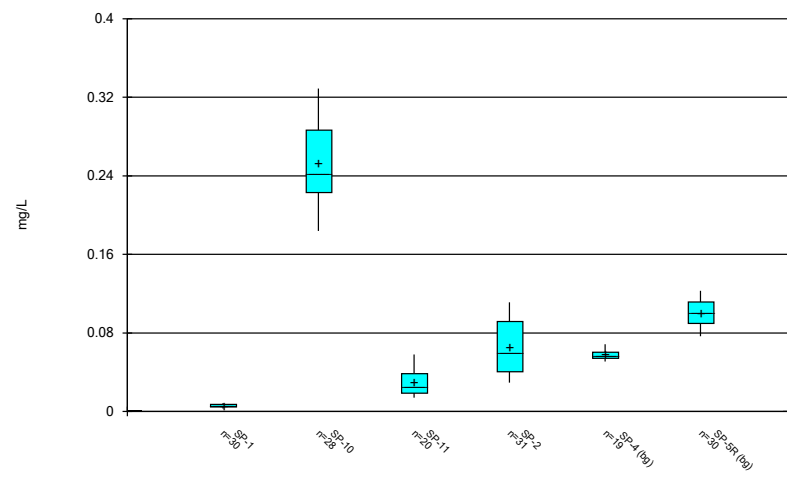
Constituent: Fluoride Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



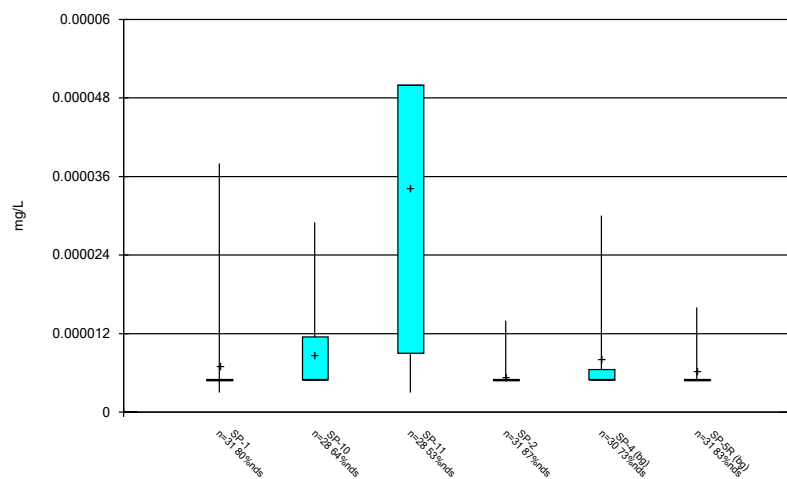
Constituent: Lead Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



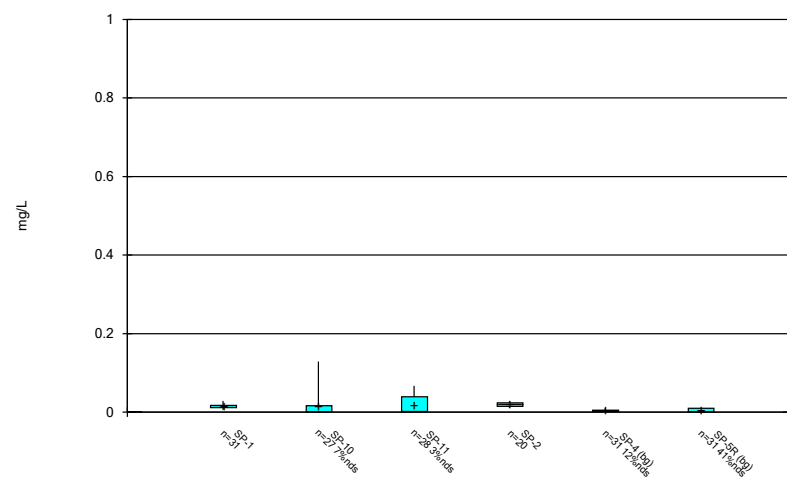
Constituent: Lithium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



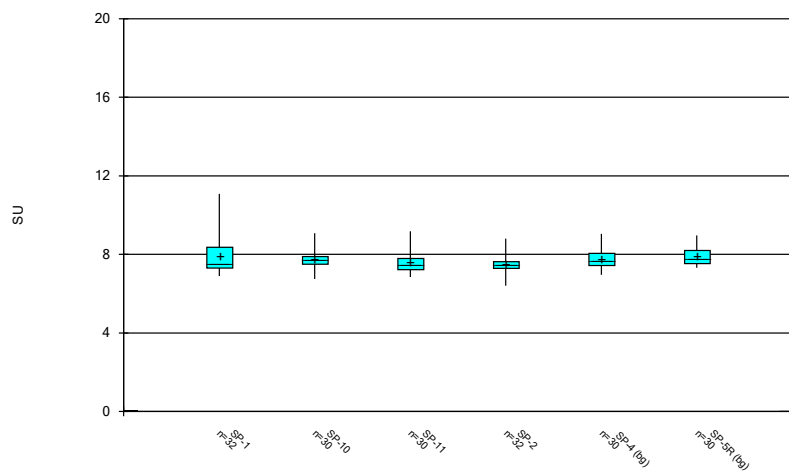
Constituent: Mercury Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



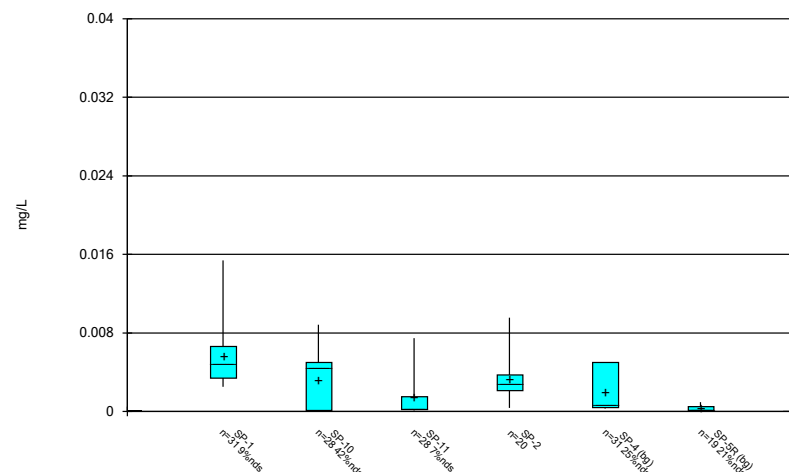
Constituent: Molybdenum Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



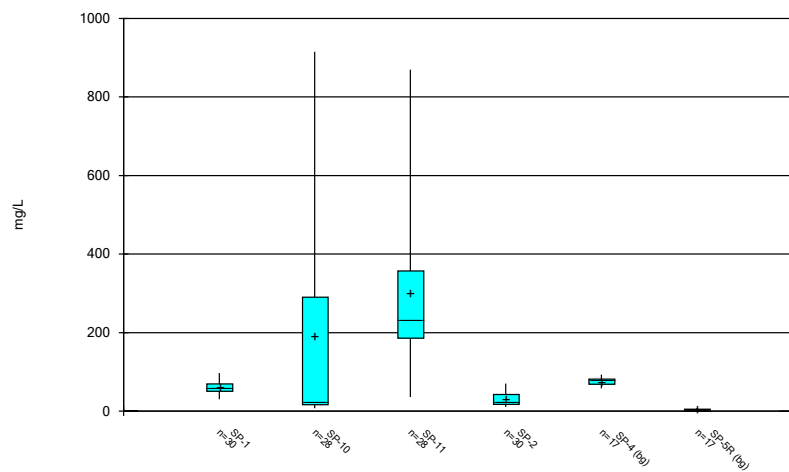
Constituent: pH, field Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



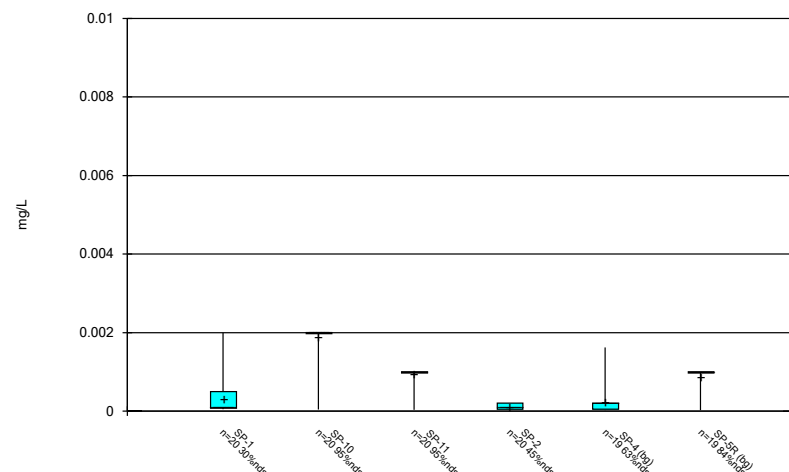
Constituent: Selenium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



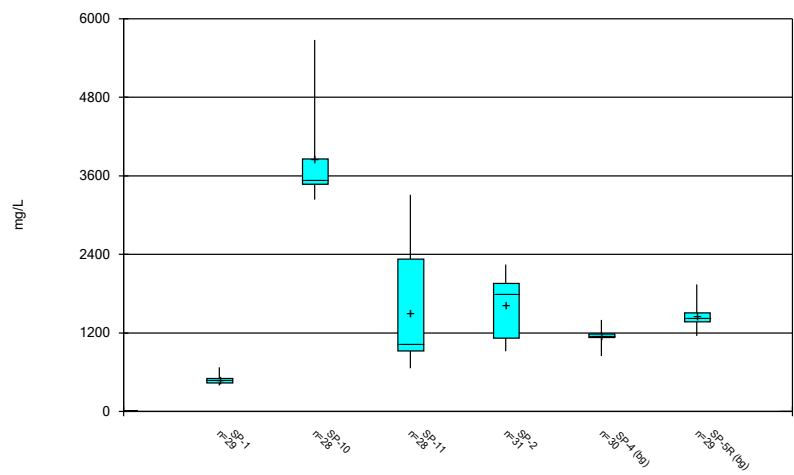
Constituent: Sulfate Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



Constituent: Thallium Analysis Run 2/13/2026 1:57 PM View: Descriptive  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 2/13/2026 1:57 PM View: Descriptive  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

## FIGURE C

Outlier Summary and Tukey's Outlier Test

# Outlier Summary

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/5/2026, 11:00 AM

Date	SP-4 Arsenic (mg/L)	SP-4 Beryllium (mg/L)	SP-1 Chloride (mg/L)	SP-4 Chloride (mg/L)	SP-5R Chloride (mg/L)	SP-10 Chromium (mg/L)	SP-1 Combined Radium 226 + 228 (pCi/L)	SP-11 Combined Radium 226 + 228 (pCi/L)	SP-5R Combined Radium 226 + 228 (pCi/L)	SP-1 Fluoride (mg/L)
3/13/2017		548 (o)								4 (o)
3/15/2017			52 (o)	62 (o)						
5/18/2017				1834 (o)						
6/27/2017						14.29 (o)				
7/13/2017					0.11 (o)					
8/4/2017	0.04498 (o)	0.00497 (o)					25.367 (o)			
7/30/2018										
6/20/2019										
10/10/2023										24.78 (o)

Date	SP-4 Lead (mg/L)	SP-1 Lithium (mg/L)	SP-5R Lithium (mg/L)	SP-4 Mercury (mg/L)	SP-10 Molybdenum (mg/L)	SP-1 Total Dissolved Solids [TDS] (mg/L)	SP-5R Total Dissolved Solids [TDS] (mg/L)
3/13/2017							
3/15/2017							
5/18/2017			0.163 (o)			3008 (o)	
6/27/2017							
7/13/2017					0.934 (o)		
8/4/2017	0.03663 (o)			5.8E-05 (o)			
7/30/2018					1060 (o)		
6/20/2019		0.03 (J,o)					
10/10/2023							

# Tukey's Outlier Test - Upgradient Wells - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/23/2026, 3:11 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Chloride (mg/L)	SP-4,SP-5R	Yes	1834	NP	NaN	60	584.7	241.1	sqrt(x)	ShapiroFrancia
Fluoride (mg/L)	SP-4,SP-5R	Yes	4.086,1.747,4.17,0.5,1.535,4.11,4.39	NP	NaN	64	3.185	0.5896	x^2	ShapiroFrancia
Thallium (mg/L)	SP-4,SP-5R	Yes	0.00162	NP	NaN	38	0.0007887	0.0004352	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	SP-4,SP-5R	Yes	3008	NP	NaN	60	1335	291	ln(x)	ShapiroFrancia

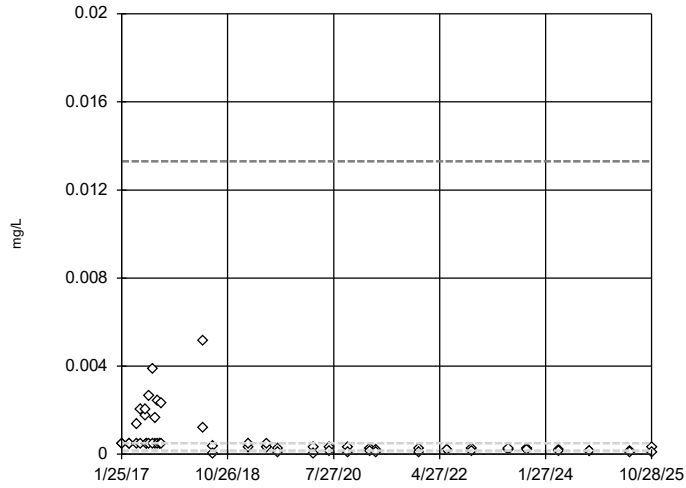
# Tukey's Outlier Test - Upgradient Wells - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/23/2026, 3:11 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.0006677	0.0009503	ln(x)	ShapiroFrancia
Arsenic (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.0127	0.01324	x^(1/3)	ShapiroFrancia
Barium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	50	1.378	0.8966	x^3	ShapiroFrancia
Beryllium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.0003361	0.0007394	ln(x)	ShapiroFrancia
Boron (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.3111	0.09255	ln(x)	ShapiroFrancia
Cadmium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	38	0.00006447	0.00005097	ln(x)	ShapiroWilk
<b>Chloride (mg/L)</b>	<b>SP-4,SP-5R</b>	<b>Yes</b>	<b>1834</b>	<b>NP</b>	<b>NaN</b>	<b>60</b>	<b>584.7</b>	<b>241.1</b>	<b>sqrt(x)</b>	<b>ShapiroFrancia</b>
Chromium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	50	0.0009288	0.0009608	ln(x)	ShapiroFrancia
Cobalt (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.002669	0.006382	ln(x)	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	SP-4,SP-5R	No	n/a	NP	NaN	61	8.37	4.531	x^(1/3)	ShapiroFrancia
<b>Fluoride (mg/L)</b>	<b>SP-4,SP-5R</b>	<b>Yes</b>	<b>4.086,1.747,4.17,0.5,1.535,4.11,4.39</b>	<b>NP</b>	<b>NaN</b>	<b>64</b>	<b>3.185</b>	<b>0.5896</b>	<b>x^2</b>	<b>ShapiroFrancia</b>
Lead (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.00216	0.005033	ln(x)	ShapiroFrancia
Lithium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	50	0.08529	0.02581	x^(1/3)	ShapiroFrancia
Mercury (mg/L)	SP-4,SP-5R	n/a	n/a	NP	NaN	62	0.000007968	0.000008394	unknown	ShapiroFrancia
Molybdenum (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	62	0.0044	0.003736	ln(x)	ShapiroFrancia
pH, field (SU)	SP-4,SP-5R	No	n/a	NP	NaN	60	7.855	0.5061	ln(x)	ShapiroFrancia
Selenium (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	50	0.0006054	0.0007432	ln(x)	ShapiroFrancia
Sulfate (mg/L)	SP-4,SP-5R	No	n/a	NP	NaN	34	38.98	36.66	ln(x)	ShapiroWilk
<b>Thallium (mg/L)</b>	<b>SP-4,SP-5R</b>	<b>Yes</b>	<b>0.00162</b>	<b>NP</b>	<b>NaN</b>	<b>38</b>	<b>0.0007887</b>	<b>0.0004352</b>	<b>x^2</b>	<b>ShapiroWilk</b>
<b>Total Dissolved Solids [TDS] (mg/L)</b>	<b>SP-4,SP-5R</b>	<b>Yes</b>	<b>3008</b>	<b>NP</b>	<b>NaN</b>	<b>60</b>	<b>1335</b>	<b>291</b>	<b>ln(x)</b>	<b>ShapiroFrancia</b>

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

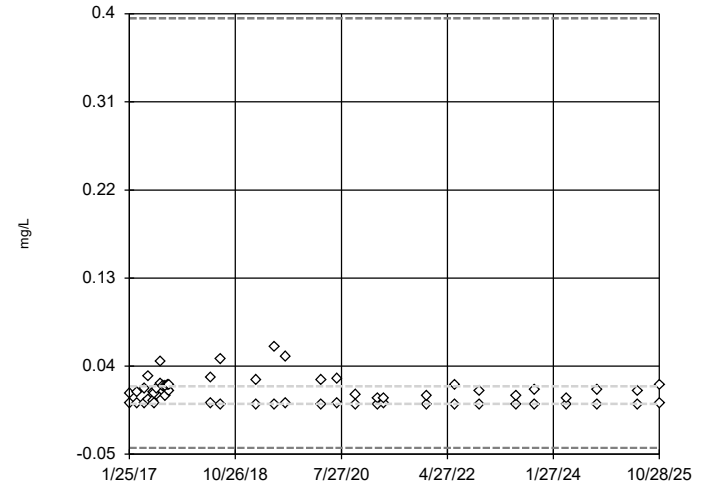


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0133,  
 low cutoff = 0.00006296,  
 based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 1/23/2026 3:09 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

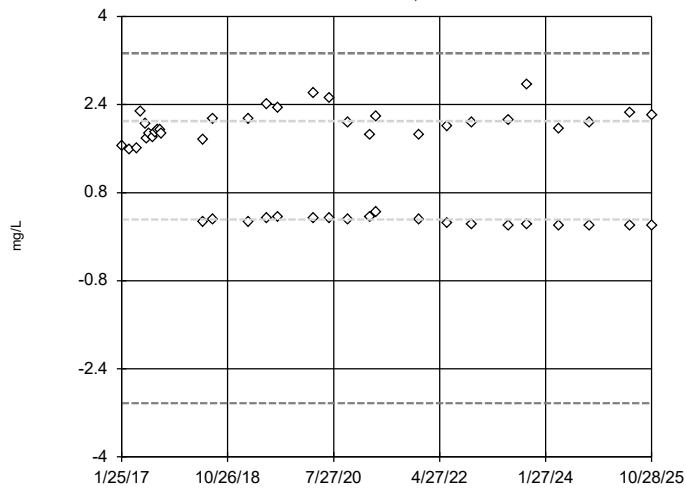


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.3954,  
 low cutoff = -0.04352,  
 based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 1/23/2026 3:09 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

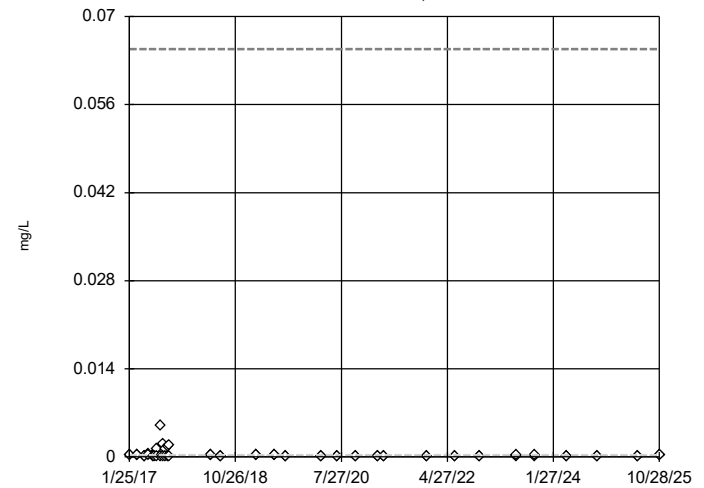


n = 50  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 3.331, low cutoff = -3.025, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 1/23/2026 3:09 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

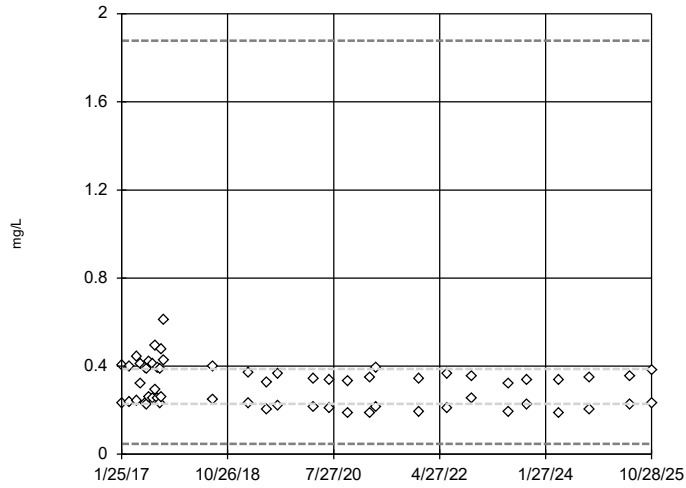


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0648,  
 low cutoff = 2.3e-7, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

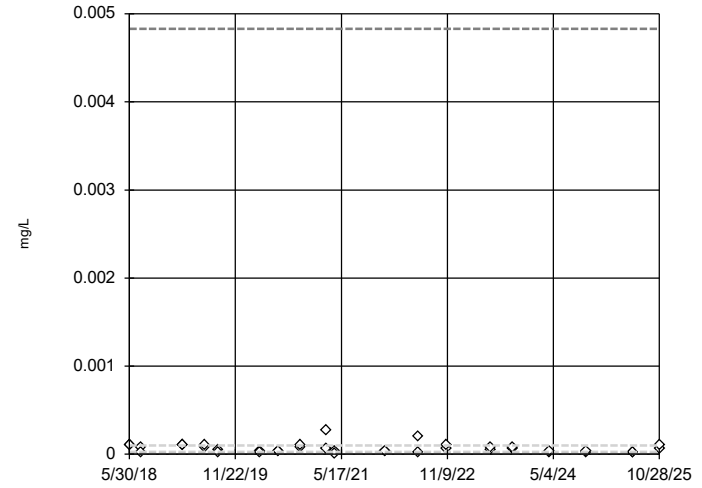


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.878, low cutoff = 0.04726, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

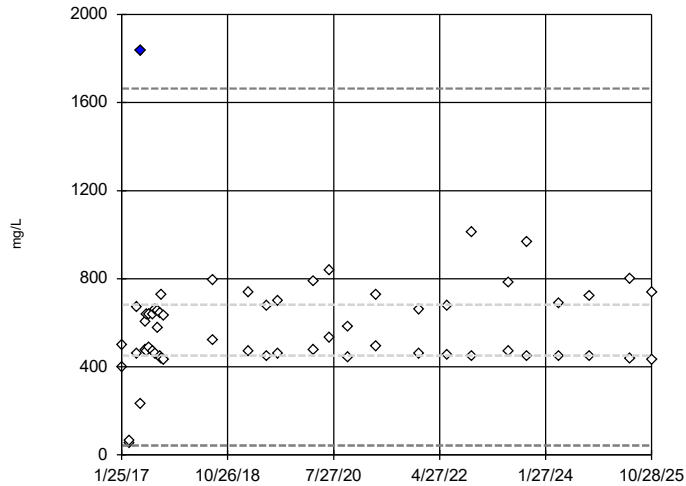


n = 38  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.00483, low cutoff = 5.7e-7, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

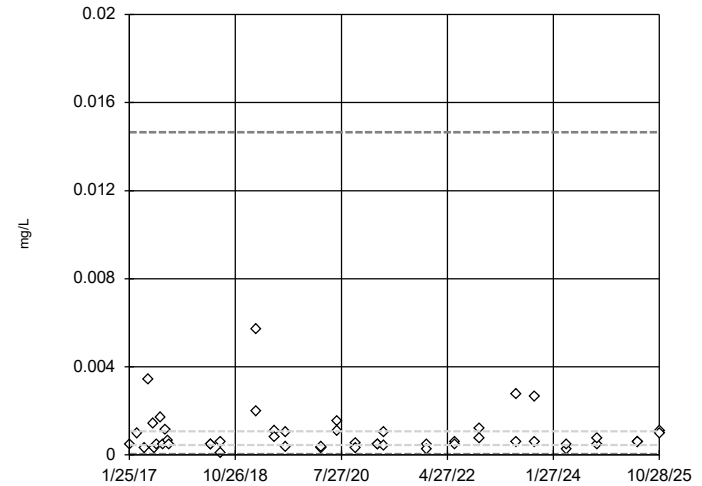


n = 60  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1664, low cutoff = 43.22, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

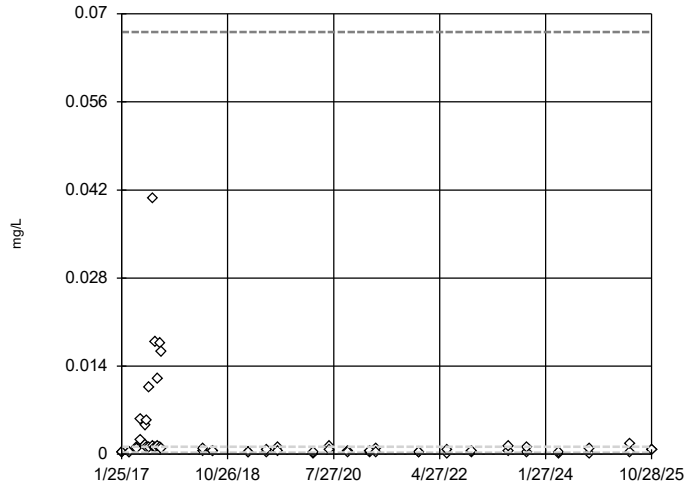


n = 50  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.01465, low cutoff = 0.00003302, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

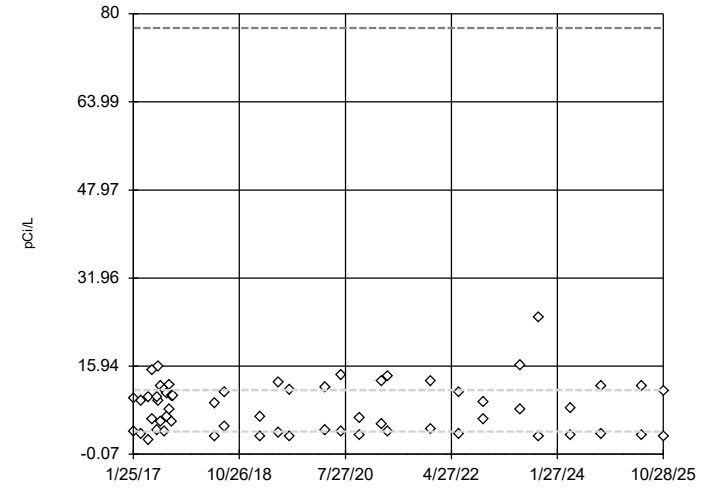


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.06709, low cutoff = 0.00005504, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

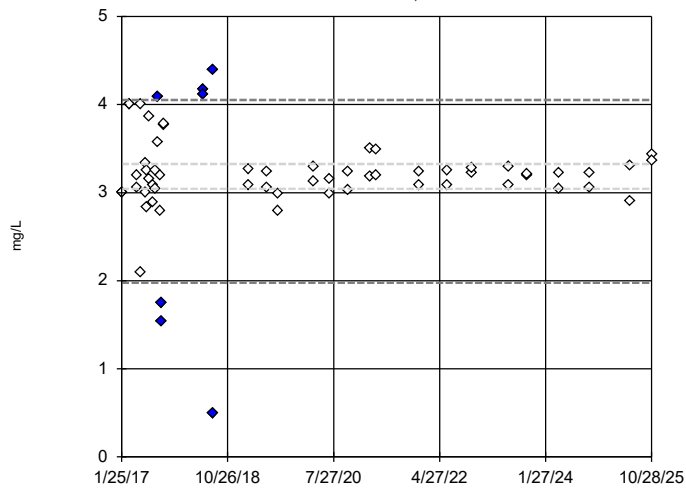


n = 61  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 77.4, low cutoff = -0.06565, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgrade  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

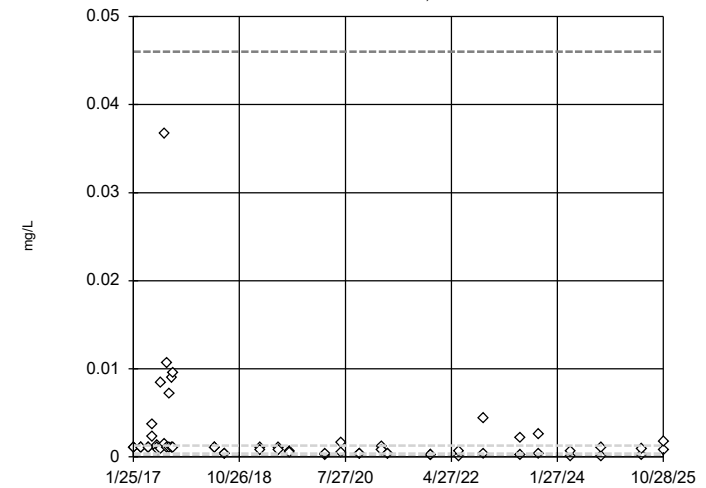


n = 64  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 4.052, low cutoff = 1.977, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

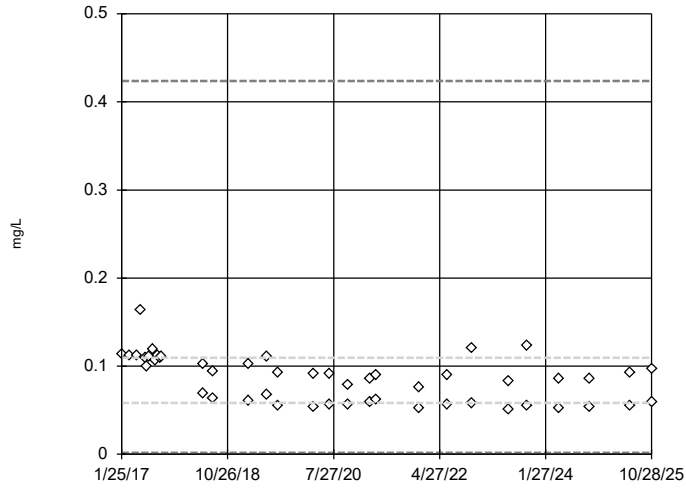


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.046, low cutoff = 0.0000107, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

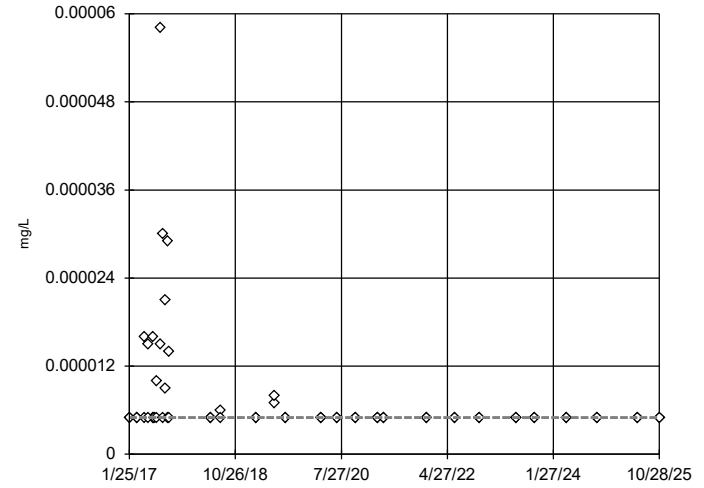


n = 50  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.4237,  
 low cutoff = 0.001516,  
 based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

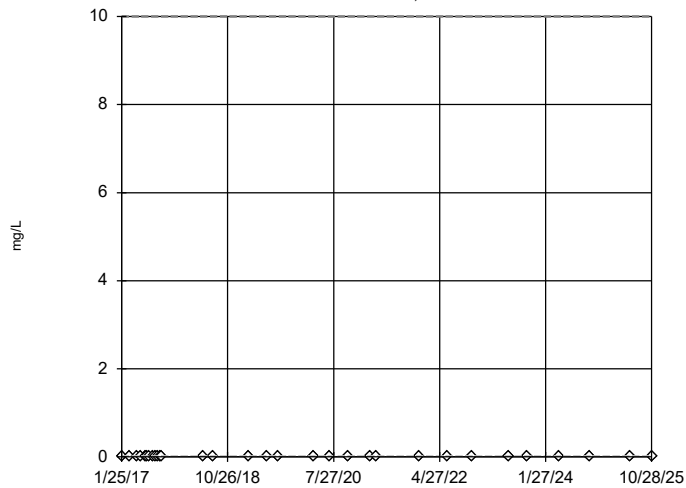


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

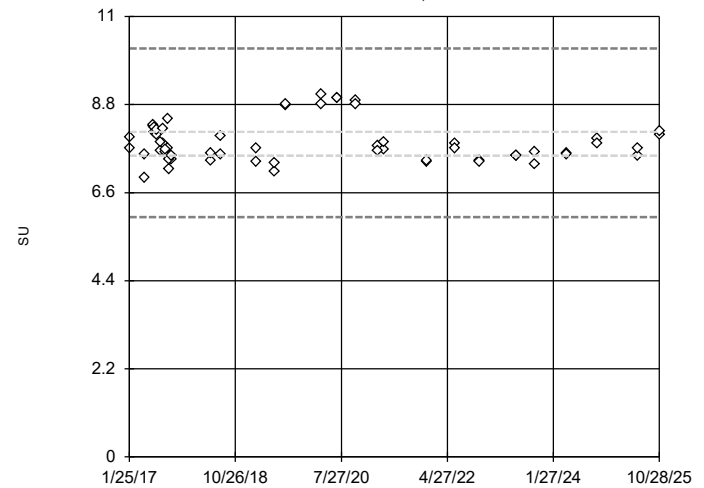


n = 62  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 10, low cutoff = 0.000001, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

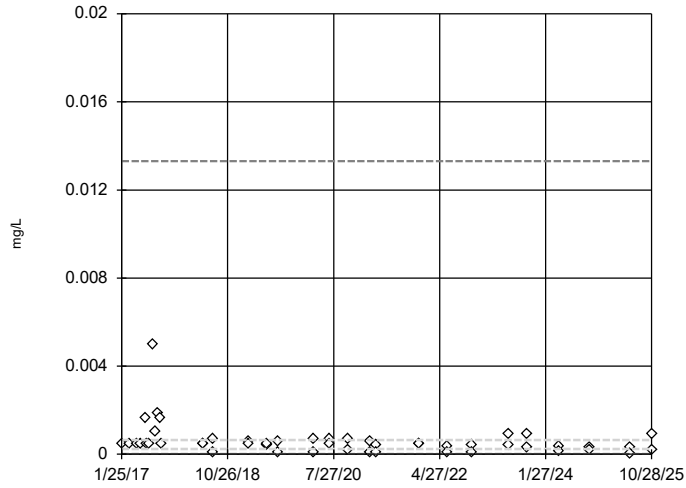


n = 60  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 10.2, low cutoff = 5.989, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

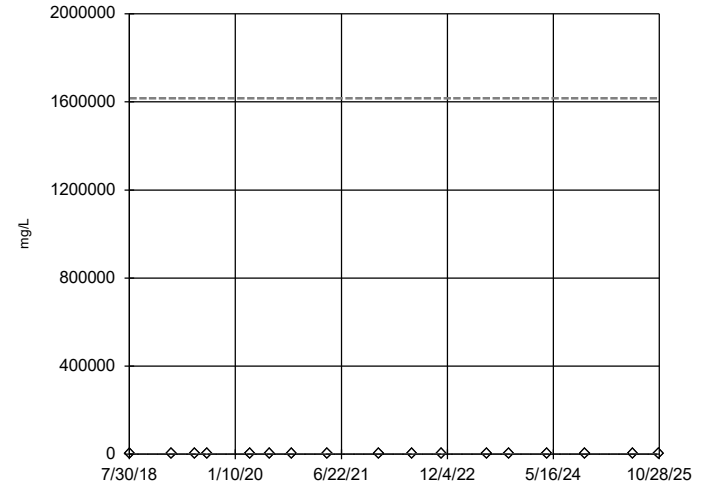


n = 50  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.01331,  
 low cutoff = 0.00001152,  
 based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

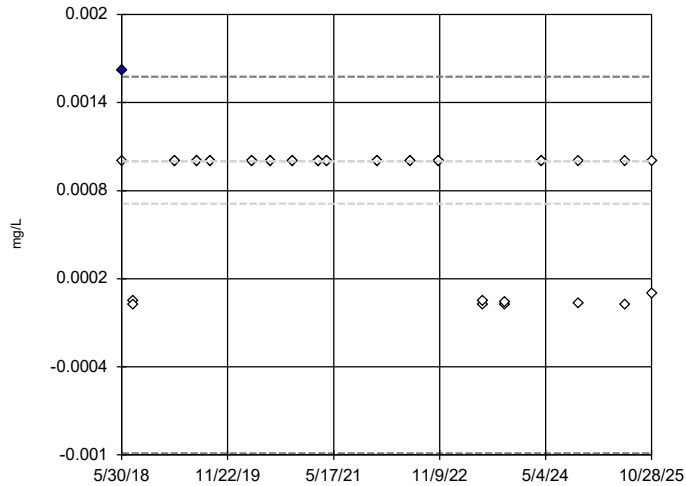


n = 34  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1616130,  
 low cutoff = 0.000142,  
 based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R

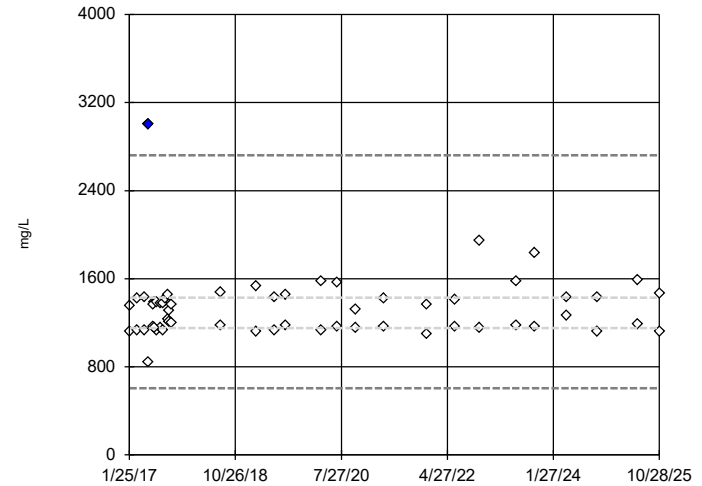


n = 38  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.001576,  
 low cutoff = -0.0009899,  
 based on IQR multiplier of 3.

Constituent: Thallium Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient Wells  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tukey's Outlier Screening, Pooled Background

SP-4,SP-5R



n = 60  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2720, low cutoff = 605.6,  
 based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/23/2026 3:10 PM View: Outlier Test - Upgradient  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

## FIGURE D

Upgradient Trend Tests – Appendix A

# Appendix A Trend Tests - Upgradient Wells - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/26/2026, 1:19 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	SP-4 (bg)	-0.01052	-220	-152	Yes	31	0	n/a	n/a	0.01	NP
Boron (mg/L)	SP-5R (bg)	-0.006532	-182	-152	Yes	31	0	n/a	n/a	0.01	NP
Chloride (mg/L)	SP-5R (bg)	20.46	178	131	Yes	28	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	SP-4 (bg)	3.532	80	63	Yes	17	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	SP-5R (bg)	21.26	160	139	Yes	29	0	n/a	n/a	0.01	NP

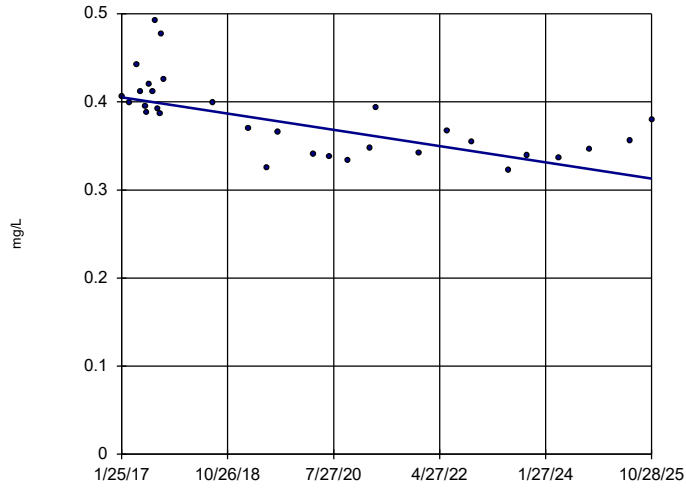
# Appendix A Trend Tests - Upgradient Wells - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/26/2026, 1:19 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
<b>Boron (mg/L)</b>	<b>SP-4 (bg)</b>	<b>-0.01052</b>	<b>-220</b>	<b>-152</b>	<b>Yes</b>	<b>31</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Boron (mg/L)</b>	<b>SP-5R (bg)</b>	<b>-0.006532</b>	<b>-182</b>	<b>-152</b>	<b>Yes</b>	<b>31</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Chloride (mg/L)	SP-4 (bg)	-1.813	-67	-139	No	29	0	n/a	n/a	0.01	NP
<b>Chloride (mg/L)</b>	<b>SP-5R (bg)</b>	<b>20.46</b>	<b>178</b>	<b>131</b>	<b>Yes</b>	<b>28</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Fluoride (mg/L)	SP-4 (bg)	-0.001762	-9	-161	No	32	3.125	n/a	n/a	0.01	NP
Fluoride (mg/L)	SP-5R (bg)	0.008799	46	161	No	32	0	n/a	n/a	0.01	NP
pH, field (SU)	SP-4 (bg)	-0.004525	-9	-146	No	30	0	n/a	n/a	0.01	NP
pH, field (SU)	SP-5R (bg)	-0.03344	-68	-146	No	30	0	n/a	n/a	0.01	NP
<b>Sulfate (mg/L)</b>	<b>SP-4 (bg)</b>	<b>3.532</b>	<b>80</b>	<b>63</b>	<b>Yes</b>	<b>17</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Sulfate (mg/L)	SP-5R (bg)	-0.1487	-13	-63	No	17	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	SP-4 (bg)	0.66	20	146	No	30	0	n/a	n/a	0.01	NP
<b>Total Dissolved Solids [TDS] (mg/L)</b>	<b>SP-5R (bg)</b>	<b>21.26</b>	<b>160</b>	<b>139</b>	<b>Yes</b>	<b>29</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>

### Sen's Slope Estimator

SP-4 (bg)

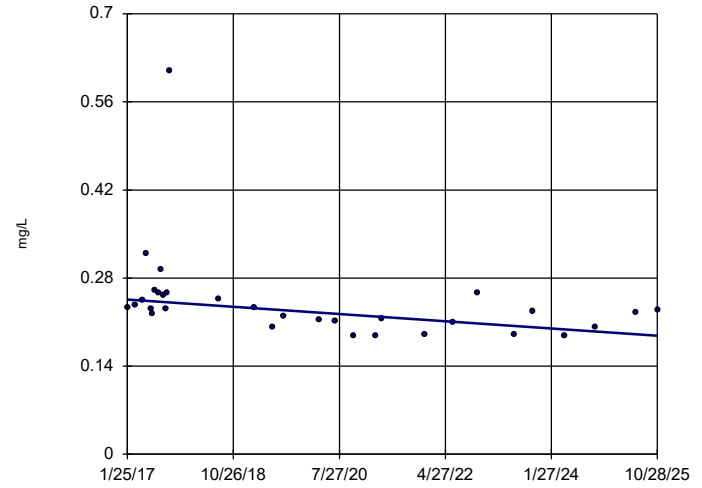


n = 31  
 Slope = -0.01052  
 units per year.  
 Mann-Kendall  
 statistic = -220  
 critical = -152  
 Decreasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Boron Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

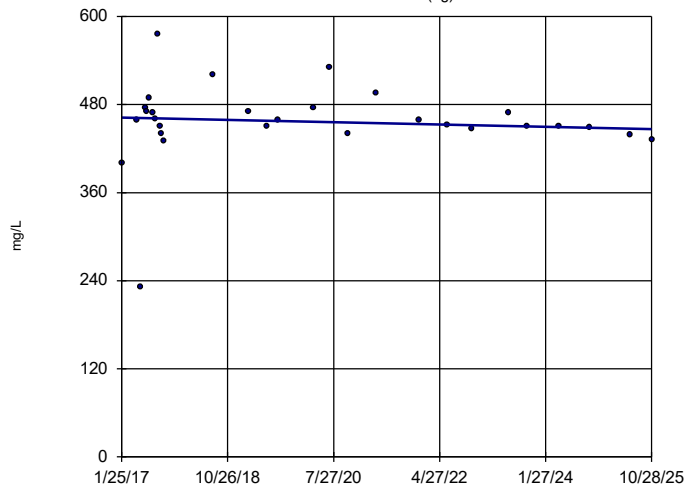


n = 31  
 Slope = -0.006532  
 units per year.  
 Mann-Kendall  
 statistic = -182  
 critical = -152  
 Decreasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Boron Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

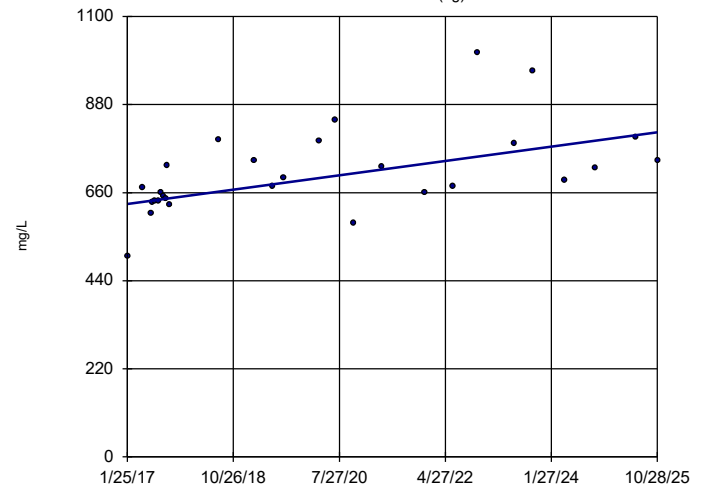


n = 29  
 Slope = -1.813  
 units per year.  
 Mann-Kendall  
 statistic = -67  
 critical = -139  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Chloride Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

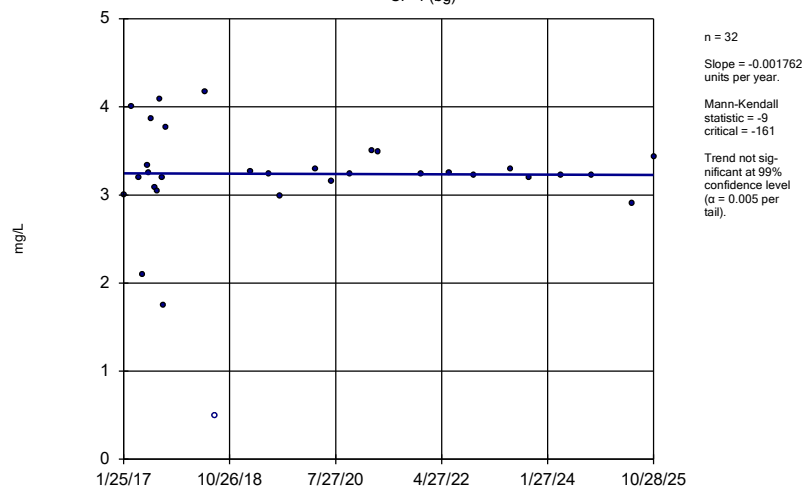


n = 28  
 Slope = 20.46  
 units per year.  
 Mann-Kendall  
 statistic = 178  
 critical = 131  
 Increasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Chloride Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

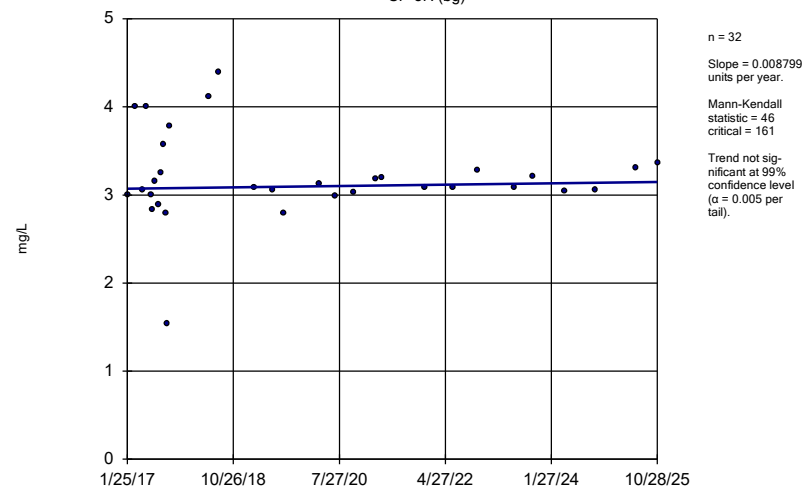
SP-4 (bg)



Constituent: Fluoride Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

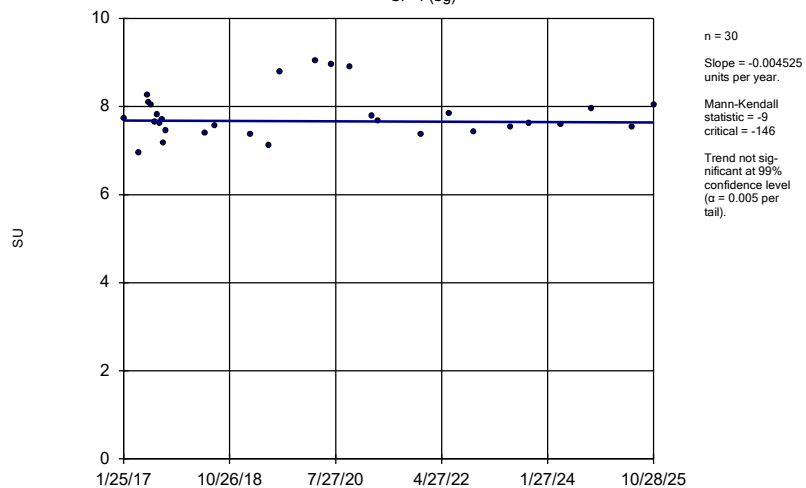
SP-5R (bg)



Constituent: Fluoride Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

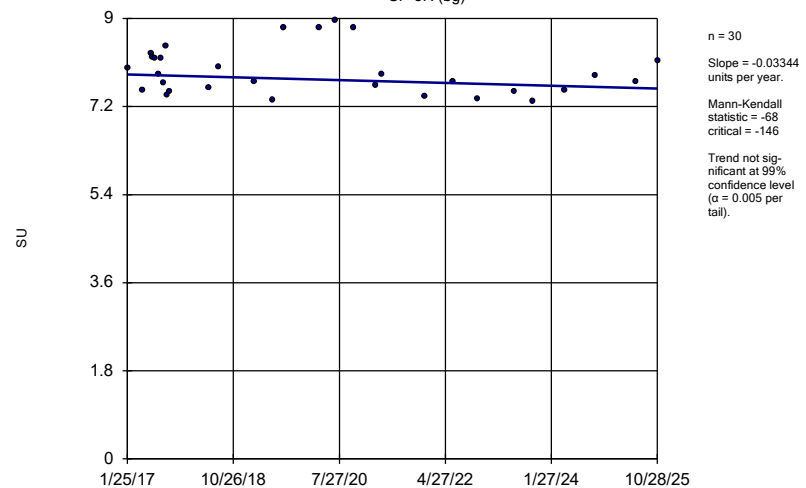
SP-4 (bg)



Constituent: pH, field Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

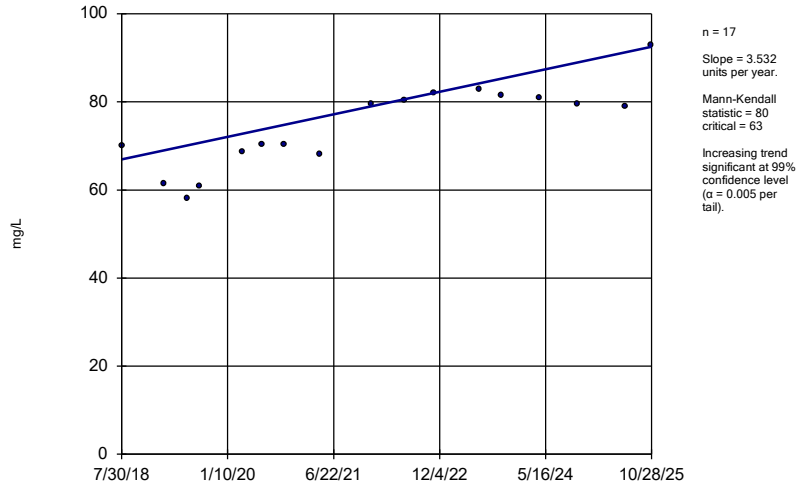
SP-5R (bg)



Constituent: pH, field Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

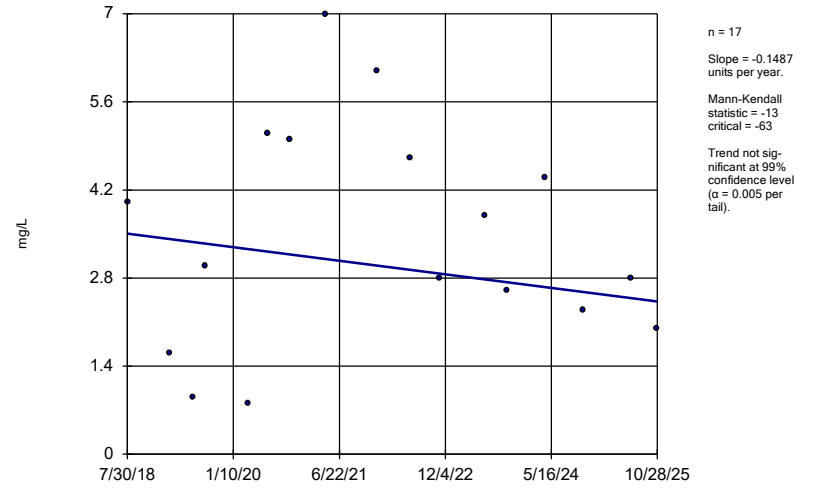
SP-4 (bg)



Constituent: Sulfate Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

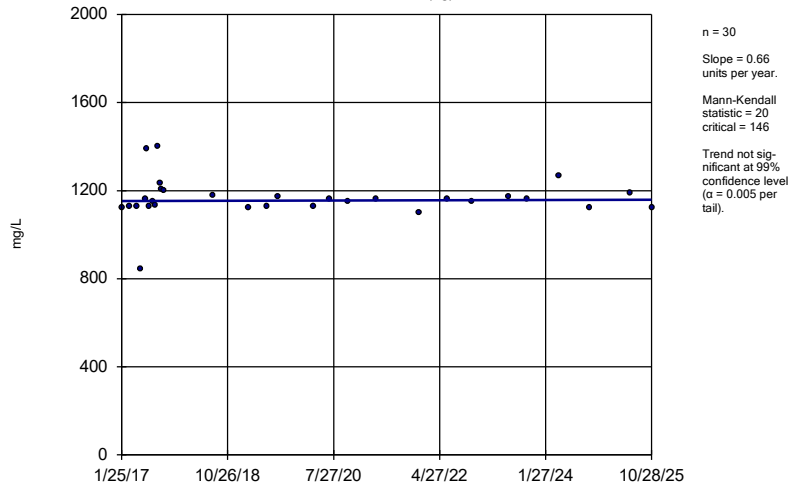
SP-5R (bg)



Constituent: Sulfate Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

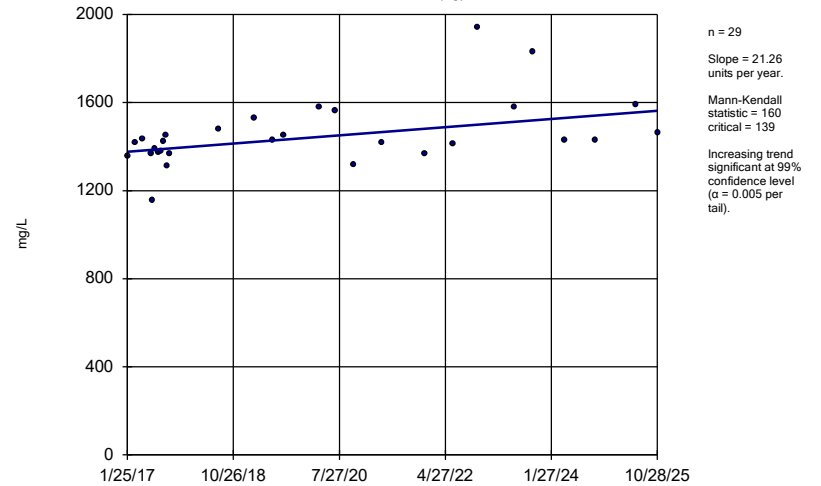
SP-4 (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2026 1:18 PM View: Appendix A - Upgradient  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

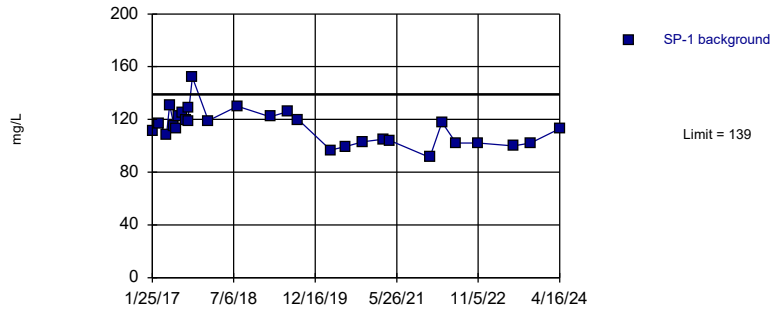
FIGURE E  
Intrawell PLs

# Intrawell Prediction Limits

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/26/2026, 1:14 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Calcium (mg/L)	SP-1	139	n/a	n/a	1 future	n/a	29	0	No	0.00188	Param Intra 1 of 2
Calcium (mg/L)	SP-10	176.8	n/a	n/a	1 future	n/a	25	0	ln(x)	0.00188	Param Intra 1 of 2
Calcium (mg/L)	SP-11	146.1	n/a	n/a	1 future	n/a	16	0	No	0.00188	Param Intra 1 of 2
Calcium (mg/L)	SP-2	171.9	n/a	n/a	1 future	n/a	28	0	No	0.00188	Param Intra 1 of 2
Calcium (mg/L)	SP-4	177.2	n/a	n/a	1 future	n/a	15	0	ln(x)	0.00188	Param Intra 1 of 2
Calcium (mg/L)	SP-5R	131	n/a	n/a	1 future	n/a	28	0	n/a	0.002337	NP Intra (normality) 1 of 2

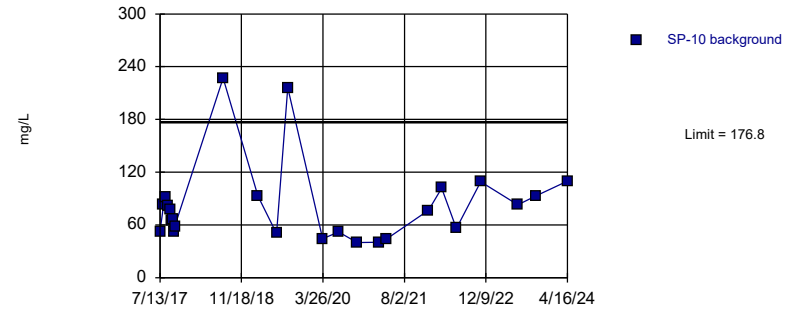
Prediction Limit  
Intrawell Parametric, SP-1



Background Data Summary: Mean=114.3, Std. Dev.=13.04, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9586, critical = 0.898. Kappa = 1.889 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

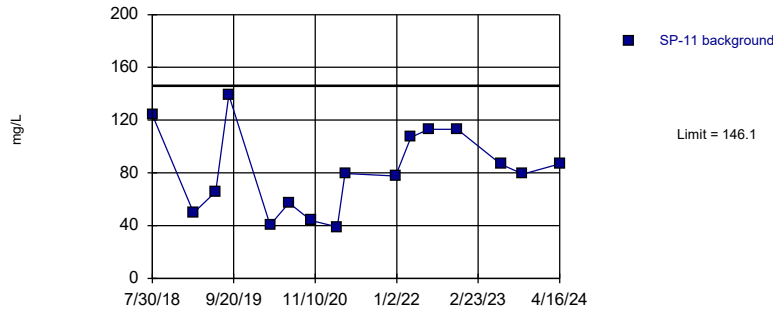
Prediction Limit  
Intrawell Parametric, SP-10



Background Data Summary (based on natural log transformation): Mean=4.301, Std. Dev.=0.4545, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9159, critical = 0.888. Kappa = 1.924 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

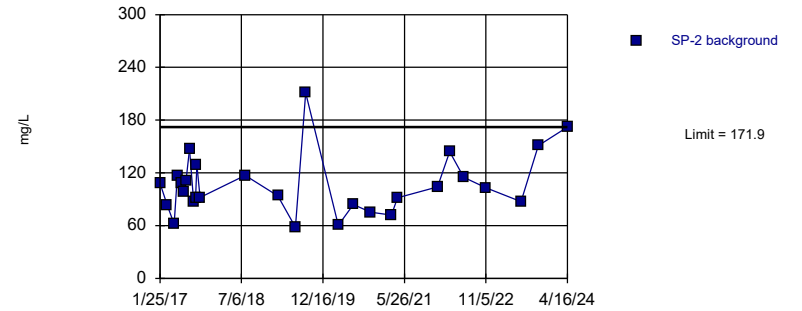
Prediction Limit  
Intrawell Parametric, SP-11



Background Data Summary: Mean=81.35, Std. Dev.=31.19, n=16. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9485, critical = 0.887. Kappa = 2.076 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Prediction Limit  
Intrawell Parametric, SP-2

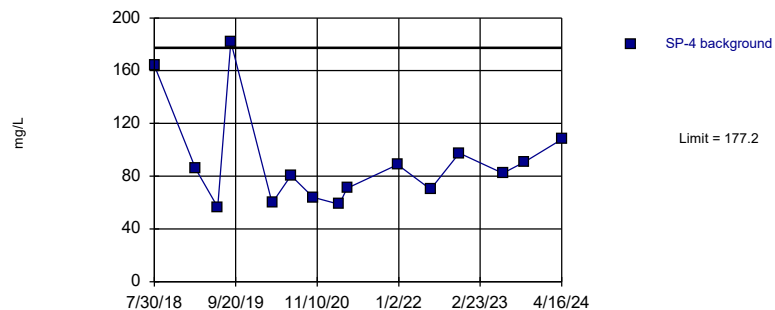


Background Data Summary: Mean=106.2, Std. Dev.=34.64, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9172, critical = 0.896. Kappa = 1.898 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Prediction Limit

Intrawell Parametric, SP-4 (bg)

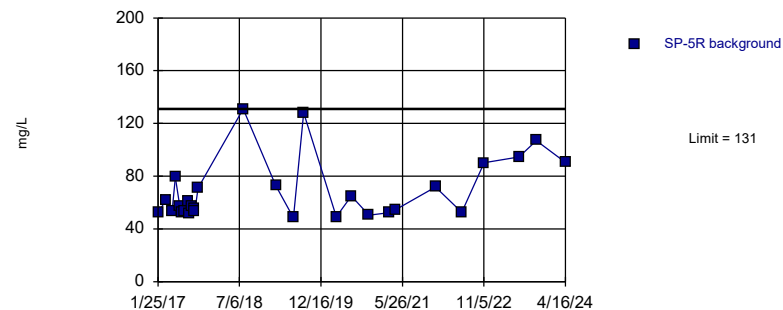


Background Data Summary (based on natural log transformation): Mean=4.445, Std. Dev.=0.3465, n=15. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8974, critical = 0.881. Kappa = 2.115 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Prediction Limit

Intrawell Non-parametric, SP-5R (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 28 background values. Well-constituent pair annual alpha = 0.004669. Individual comparison alpha = 0.002337 (1 of 2). Assumes 1 future value.

Constituent: Calcium Analysis Run 1/26/2026 1:13 PM View: Appendix A - Intrawell PLs  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

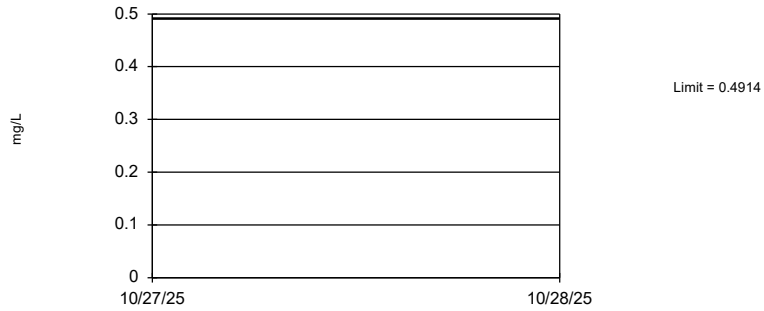
FIGURE F  
Interwell PLs

# Interwell Prediction Limits

Northeastern BAP    Client: Geosyntec    Data: Northeastern BAP    Printed 1/26/2026, 1:20 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	n/a	0.4914	n/a	n/a	4 future	n/a	62	0	x^(1/3)	0.00188	Param Inter 1 of 2
Chloride (mg/L)	n/a	1010	n/a	n/a	4 future	n/a	57	0	n/a	0.0005906	NP Inter (normality) 1 of 2
Fluoride (mg/L)	n/a	4.39	n/a	n/a	4 future	n/a	64	1.563	n/a	0.0004701	NP Inter (normality) 1 of 2
pH, field (SU)	n/a	9.05	6.96	n/a	4 future	n/a	60	0	n/a	0.001049	NP Inter (normality) 1 of 2
Sulfate (mg/L)	n/a	92.9	n/a	n/a	4 future	n/a	34	0	n/a	0.001565	NP Inter (normality) 1 of 2
Total Dissolved Solids [TDS] (mg/L)	n/a	1940	n/a	n/a	4 future	n/a	59	0	n/a	0.0005464	NP Inter (normality) 1 of 2

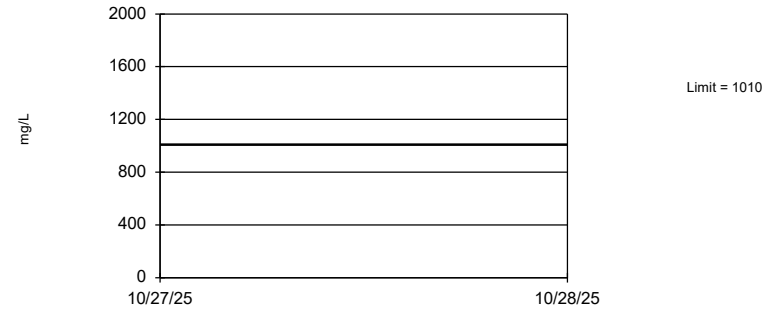
Prediction Limit  
Interwell Parametric



Background Data Summary (based on cube root transformation): Mean=0.6712, Std. Dev.=0.06627, n=62.  
Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9472, critical = 0.947. Kappa = 1.78 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 4 future values.

Constituent: Boron Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

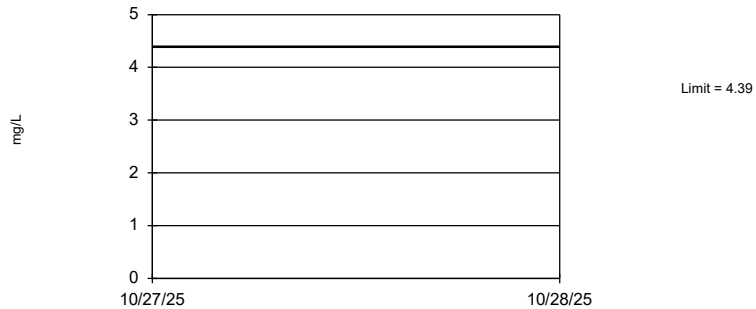
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. Annual per-constituent alpha = 0.004715. Individual comparison alpha = 0.0005906 (1 of 2). Assumes 4 future values.

Constituent: Chloride Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

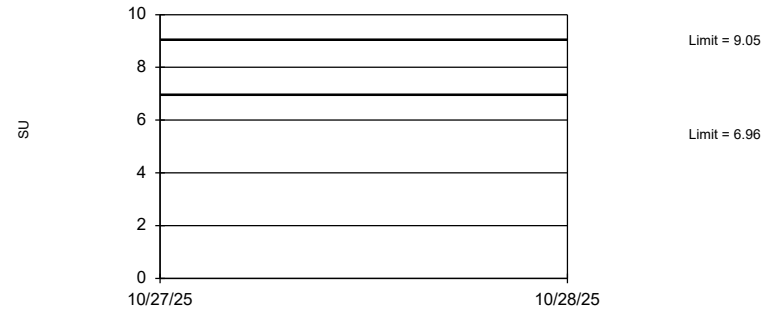
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 64 background values. 1.563% NDs. Annual per-constituent alpha = 0.003755. Individual comparison alpha = 0.0004701 (1 of 2). Assumes 4 future values.

Constituent: Fluoride Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

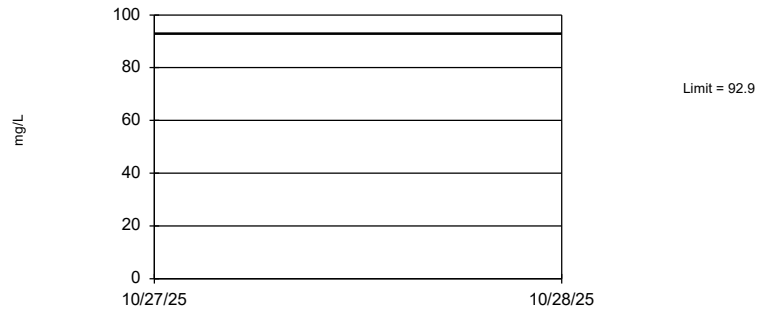
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 60 background values. Annual per-constituent alpha = 0.008374. Individual comparison alpha = 0.001049 (1 of 2). Assumes 4 future values.

Constituent: pH, field Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

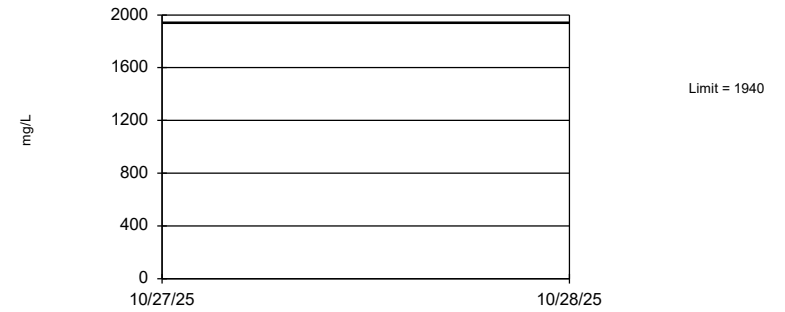
### Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 34 background values. Annual per-constituent alpha = 0.01245. Individual comparison alpha = 0.001565 (1 of 2). Assumes 4 future values.

Constituent: Sulfate Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell PLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 59 background values. Annual per-constituent alpha = 0.004363. Individual comparison alpha = 0.0005464 (1 of 2). Assumes 4 future values.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2026 1:19 PM View: Appendix A - Interwell P  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

## FIGURE G

Upgradient Trend Tests – Appendix B

# Appendix B Trend Tests - Upgradient Wells - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/5/2026, 10:43 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	SP-4 (bg)	-0.0003035	-310	-117	Yes	31	16.13	n/a	n/a	0.05	NP
Antimony (mg/L)	SP-5R (bg)	-0.0005032	-195	-117	Yes	31	38.71	n/a	n/a	0.05	NP
Arsenic (mg/L)	SP-4 (bg)	-0.0002491	-231	-112	Yes	30	10	n/a	n/a	0.05	NP
Barium (mg/L)	SP-4 (bg)	-0.01674	-76	-58	Yes	19	0	n/a	n/a	0.05	NP
Barium (mg/L)	SP-5R (bg)	0.05443	183	117	Yes	31	0	n/a	n/a	0.05	NP
Beryllium (mg/L)	SP-4 (bg)	-0.0005315	-191	-112	Yes	30	16.67	n/a	n/a	0.05	NP
Cadmium (mg/L)	SP-4 (bg)	-0.00006676	-81	-58	Yes	19	10.53	n/a	n/a	0.05	NP
Cobalt (mg/L)	SP-4 (bg)	-0.0001118	-154	-112	Yes	30	10	n/a	n/a	0.05	NP
Cobalt (mg/L)	SP-5R (bg)	-0.0001269	-185	-117	Yes	31	6.452	n/a	n/a	0.05	NP
Lead (mg/L)	SP-4 (bg)	-0.0001564	-215	-112	Yes	30	16.67	n/a	n/a	0.05	NP
Lead (mg/L)	SP-5R (bg)	-0.0001674	-140	-117	Yes	31	25.81	n/a	n/a	0.05	NP
Lithium (mg/L)	SP-4 (bg)	-0.001164	-66	-58	Yes	19	0	n/a	n/a	0.05	NP
Lithium (mg/L)	SP-5R (bg)	-0.003422	-189	-112	Yes	30	0	n/a	n/a	0.05	NP
Molybdenum (mg/L)	SP-4 (bg)	-0.0002018	-123	-117	Yes	31	12.9	n/a	n/a	0.05	NP
Molybdenum (mg/L)	SP-5R (bg)	-0.0001213	-302	-117	Yes	31	41.94	n/a	n/a	0.05	NP
Selenium (mg/L)	SP-4 (bg)	-0.0002623	-319	-117	Yes	31	25.81	n/a	n/a	0.05	NP
Thallium (mg/L)	SP-4 (bg)	0	-60	-58	Yes	19	63.16	n/a	n/a	0.05	NP

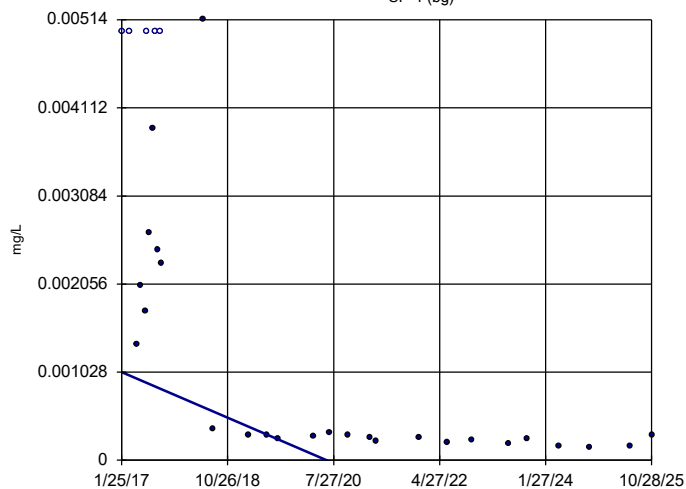
# Appendix B Trend Tests - Upgradient Wells - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/5/2026, 10:43 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	SP-4 (bg)	-0.0003035	-310	-117	Yes	31	16.13	n/a	n/a	0.05	NP
Antimony (mg/L)	SP-5R (bg)	-0.0005032	-195	-117	Yes	31	38.71	n/a	n/a	0.05	NP
Arsenic (mg/L)	SP-4 (bg)	-0.0002491	-231	-112	Yes	30	10	n/a	n/a	0.05	NP
Arsenic (mg/L)	SP-5R (bg)	-0.0004062	-27	-117	No	31	0	n/a	n/a	0.05	NP
Barium (mg/L)	SP-4 (bg)	-0.01674	-76	-58	Yes	19	0	n/a	n/a	0.05	NP
Barium (mg/L)	SP-5R (bg)	0.05443	183	117	Yes	31	0	n/a	n/a	0.05	NP
Beryllium (mg/L)	SP-4 (bg)	-0.0005315	-191	-112	Yes	30	16.67	n/a	n/a	0.05	NP
Beryllium (mg/L)	SP-5R (bg)	0	-5	-117	No	31	19.35	n/a	n/a	0.05	NP
Cadmium (mg/L)	SP-4 (bg)	-0.00006676	-81	-58	Yes	19	10.53	n/a	n/a	0.05	NP
Cadmium (mg/L)	SP-5R (bg)	0	1	58	No	19	26.32	n/a	n/a	0.05	NP
Chromium (mg/L)	SP-4 (bg)	-0.0001526	-12	-58	No	19	5.263	n/a	n/a	0.05	NP
Chromium (mg/L)	SP-5R (bg)	0	-2	-117	No	31	12.9	n/a	n/a	0.05	NP
Cobalt (mg/L)	SP-4 (bg)	-0.0001118	-154	-112	Yes	30	10	n/a	n/a	0.05	NP
Cobalt (mg/L)	SP-5R (bg)	-0.0001269	-185	-117	Yes	31	6.452	n/a	n/a	0.05	NP
Combined Radium 226 + 228 (pCi/L)	SP-4 (bg)	-0.0987	-75	-112	No	30	0	n/a	n/a	0.05	NP
Combined Radium 226 + 228 (pCi/L)	SP-5R (bg)	0.1589	46	112	No	30	0	n/a	n/a	0.05	NP
Fluoride (mg/L)	SP-4 (bg)	-0.001762	-9	-123	No	32	3.125	n/a	n/a	0.05	NP
Fluoride (mg/L)	SP-5R (bg)	0.008799	46	123	No	32	0	n/a	n/a	0.05	NP
Lead (mg/L)	SP-4 (bg)	-0.0001564	-215	-112	Yes	30	16.67	n/a	n/a	0.05	NP
Lead (mg/L)	SP-5R (bg)	-0.0001674	-140	-117	Yes	31	25.81	n/a	n/a	0.05	NP
Lithium (mg/L)	SP-4 (bg)	-0.001164	-66	-58	Yes	19	0	n/a	n/a	0.05	NP
Lithium (mg/L)	SP-5R (bg)	-0.003422	-189	-112	Yes	30	0	n/a	n/a	0.05	NP
Mercury (mg/L)	SP-4 (bg)	0	-104	-112	No	30	73.33	n/a	n/a	0.05	NP
Mercury (mg/L)	SP-5R (bg)	0	-85	-117	No	31	83.87	n/a	n/a	0.05	NP
Molybdenum (mg/L)	SP-4 (bg)	-0.0002018	-123	-117	Yes	31	12.9	n/a	n/a	0.05	NP
Molybdenum (mg/L)	SP-5R (bg)	-0.0001213	-302	-117	Yes	31	41.94	n/a	n/a	0.05	NP
Selenium (mg/L)	SP-4 (bg)	-0.0002623	-319	-117	Yes	31	25.81	n/a	n/a	0.05	NP
Selenium (mg/L)	SP-5R (bg)	0	-1	-58	No	19	21.05	n/a	n/a	0.05	NP
Thallium (mg/L)	SP-4 (bg)	0	-60	-58	Yes	19	63.16	n/a	n/a	0.05	NP
Thallium (mg/L)	SP-5R (bg)	0	-1	-58	No	19	84.21	n/a	n/a	0.05	NP

### Sen's Slope Estimator

SP-4 (bg)

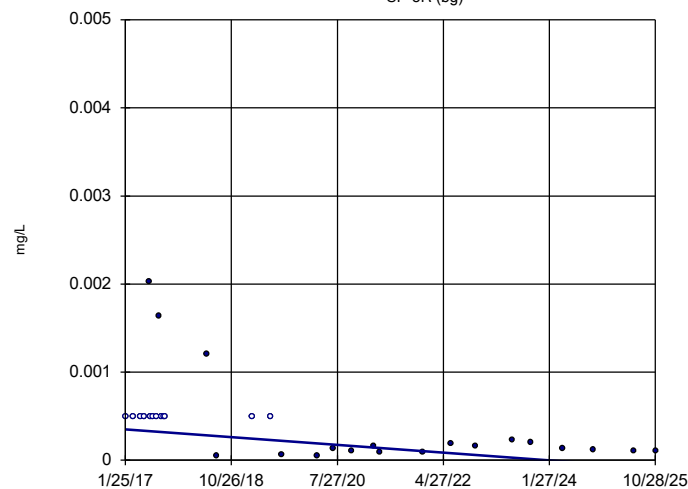


n = 31  
Slope = -0.0003035  
units per year.  
Mann-Kendall  
statistic = -310  
critical = -117  
Decreasing trend  
significant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Antimony Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

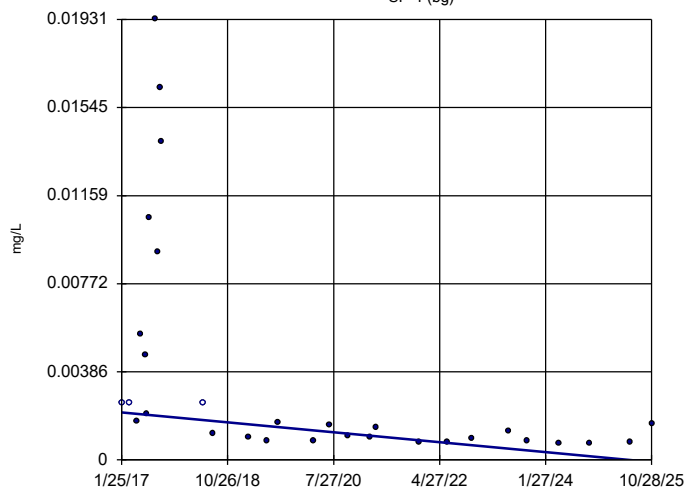


n = 31  
Slope = -0.00005032  
units per year.  
Mann-Kendall  
statistic = -195  
critical = -117  
Decreasing trend  
significant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Antimony Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

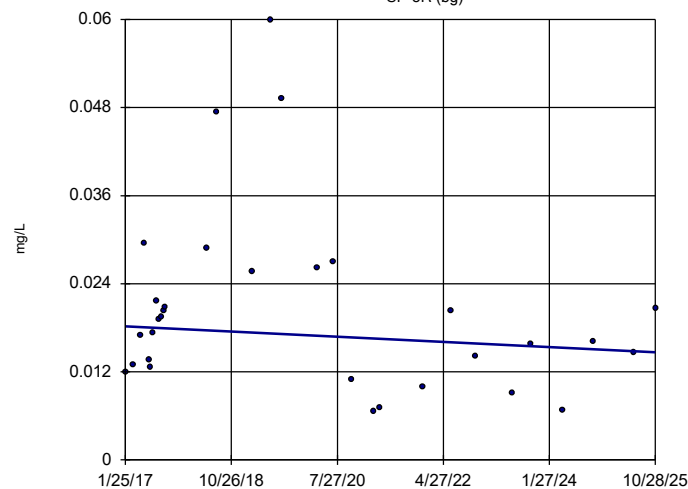


n = 30  
Slope = -0.0002491  
units per year.  
Mann-Kendall  
statistic = -231  
critical = -112  
Decreasing trend  
significant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Arsenic Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

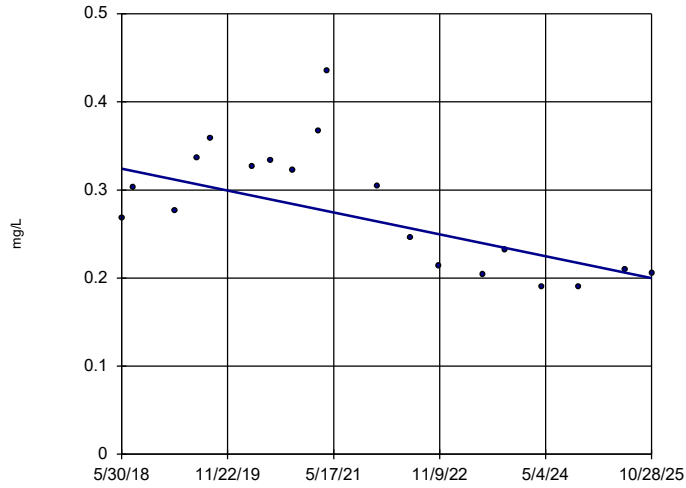


n = 31  
Slope = -0.0004062  
units per year.  
Mann-Kendall  
statistic = -27  
critical = -117  
Trend not sig-  
nificant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Arsenic Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

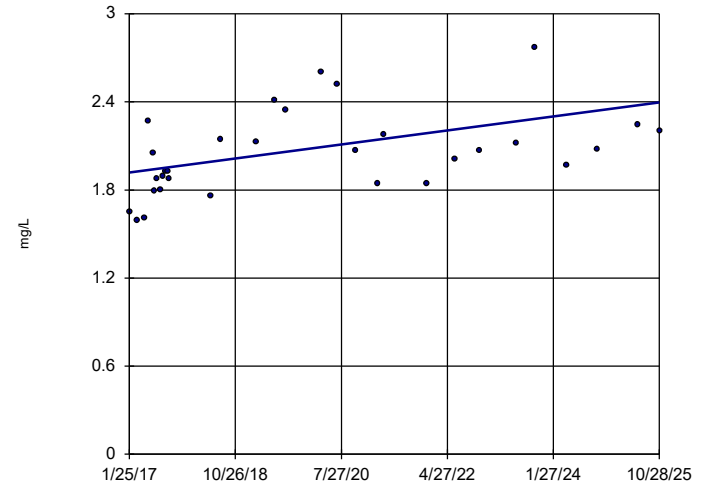


n = 19  
 Slope = -0.01674  
 units per year.  
 Mann-Kendall  
 statistic = -76  
 critical = -58  
 Decreasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Barium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

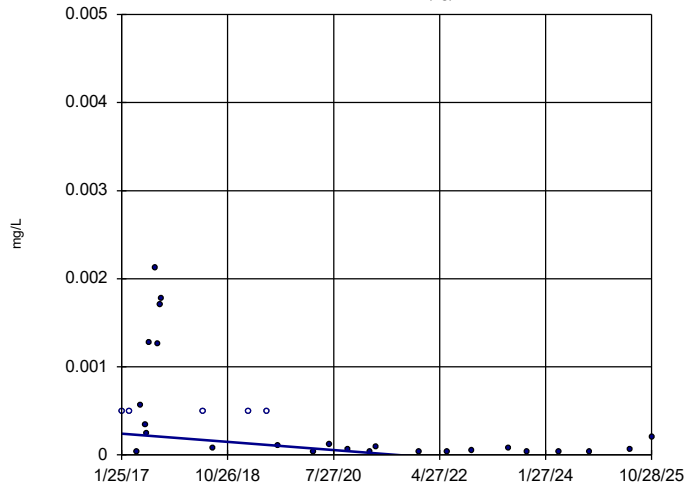


n = 31  
 Slope = 0.05443  
 units per year.  
 Mann-Kendall  
 statistic = 183  
 critical = 117  
 Increasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Barium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

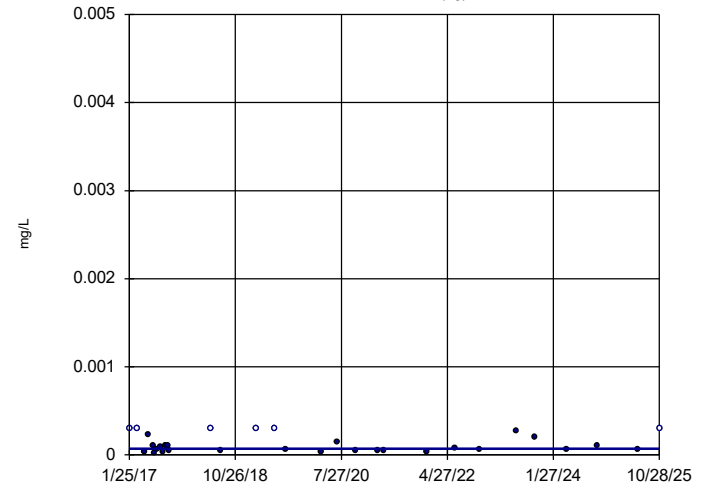


n = 30  
 Slope = -0.00005315  
 units per year.  
 Mann-Kendall  
 statistic = -191  
 critical = -112  
 Decreasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Beryllium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

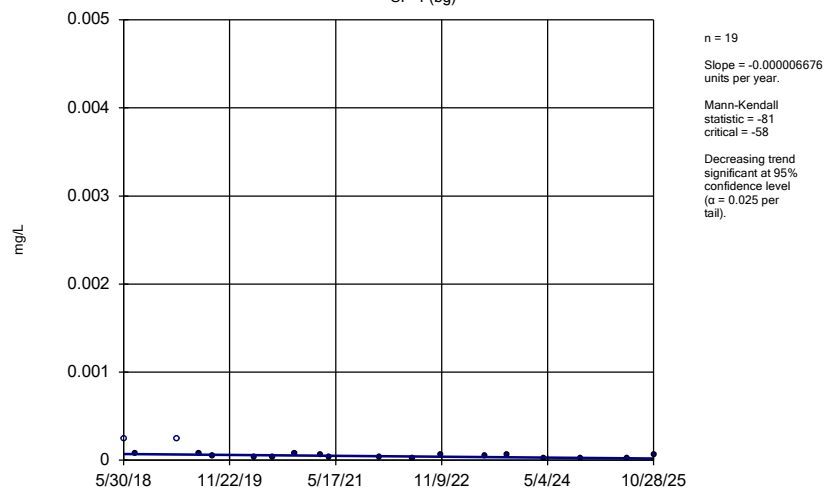


n = 31  
 Slope = 0  
 units per year.  
 Mann-Kendall  
 statistic = -5  
 critical = -117  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Beryllium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

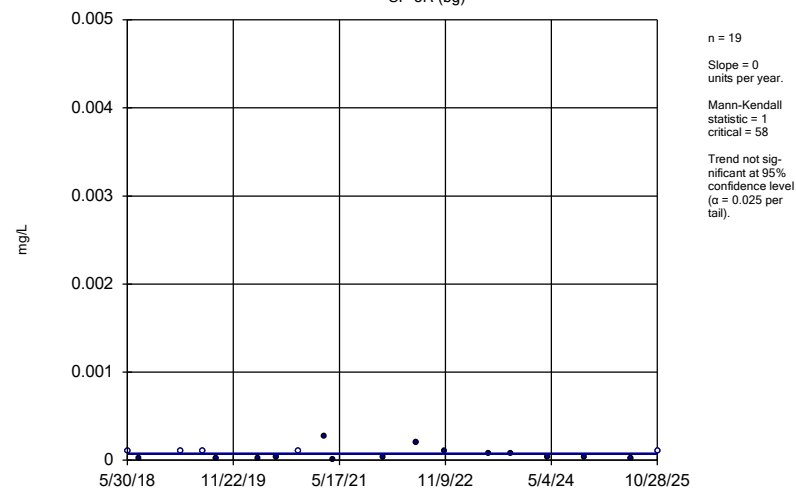
SP-4 (bg)



Constituent: Cadmium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

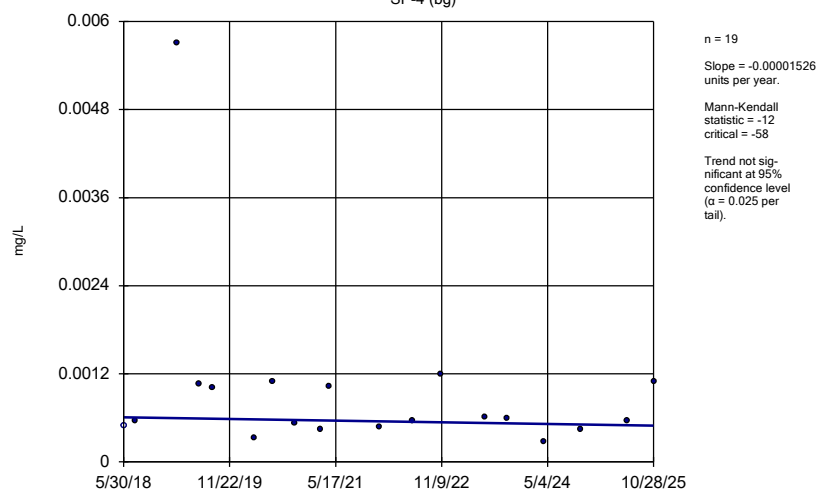
SP-5R (bg)



Constituent: Cadmium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

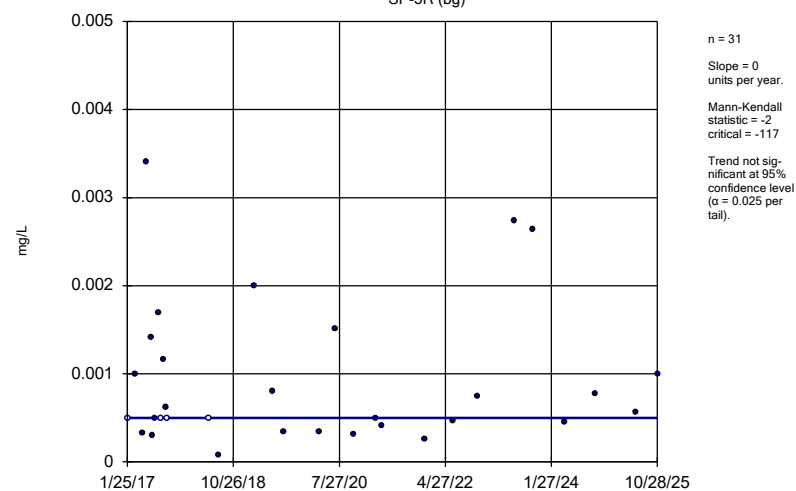
SP-4 (bg)



Constituent: Chromium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

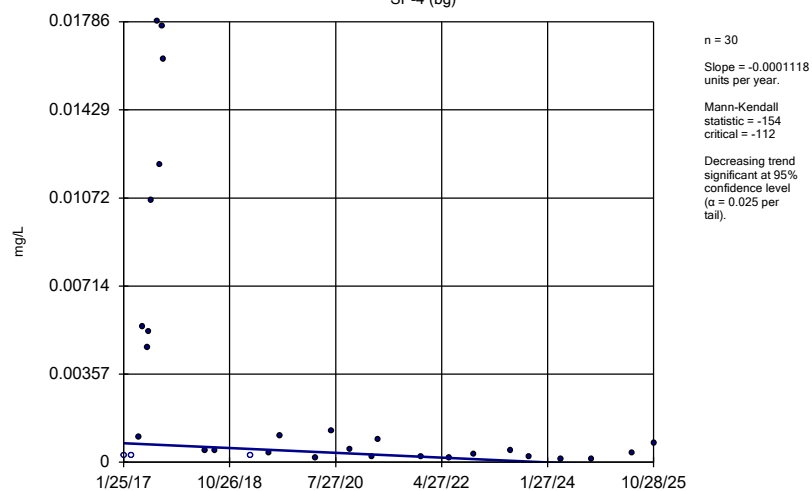
SP-5R (bg)



Constituent: Chromium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

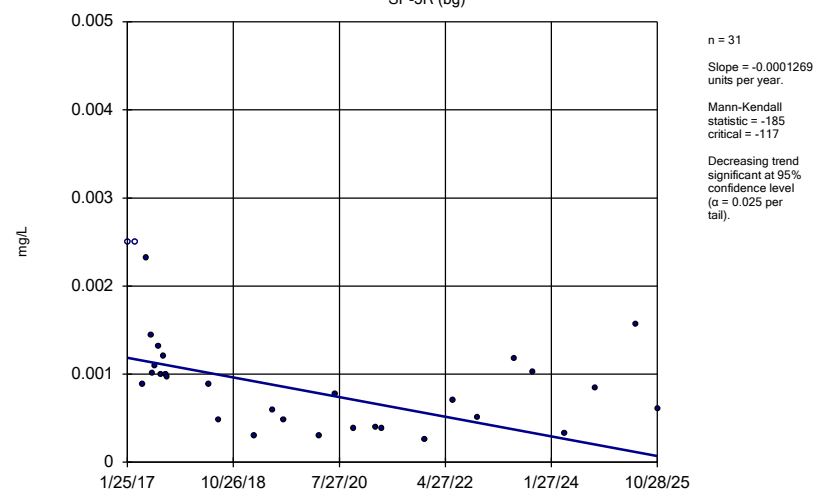
SP-4 (bg)



Constituent: Cobalt Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

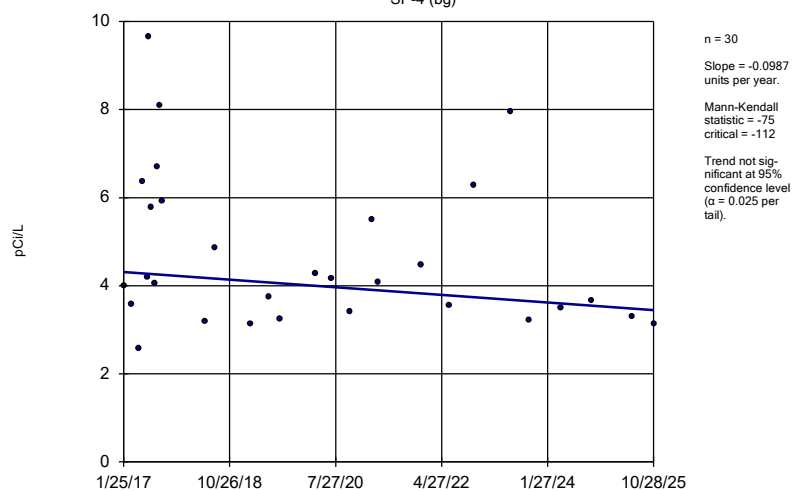
SP-5R (bg)



Constituent: Cobalt Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

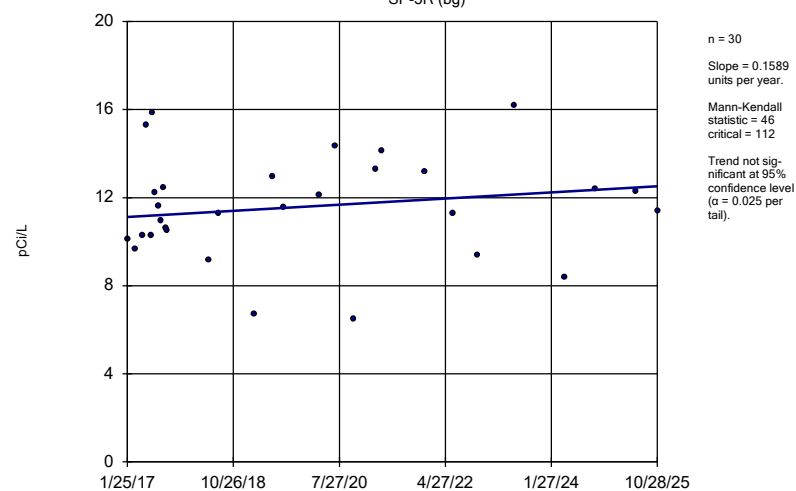
SP-4 (bg)



Constituent: Combined Radium 226 + 228 Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradie  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

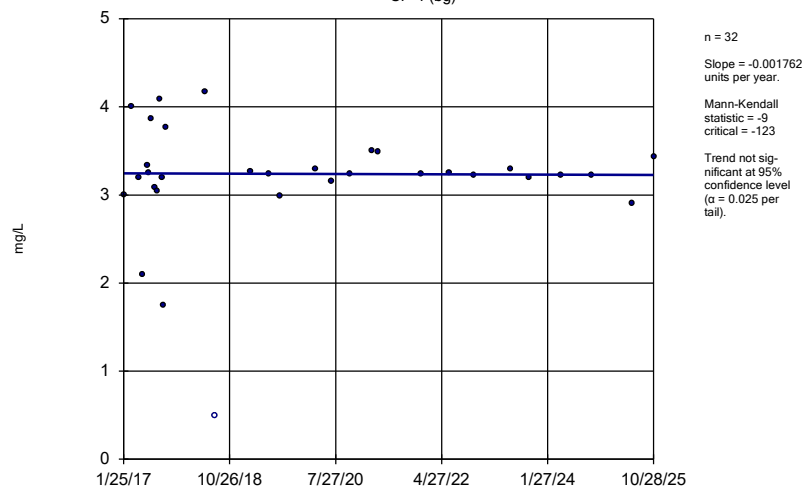
SP-5R (bg)



Constituent: Combined Radium 226 + 228 Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradie  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

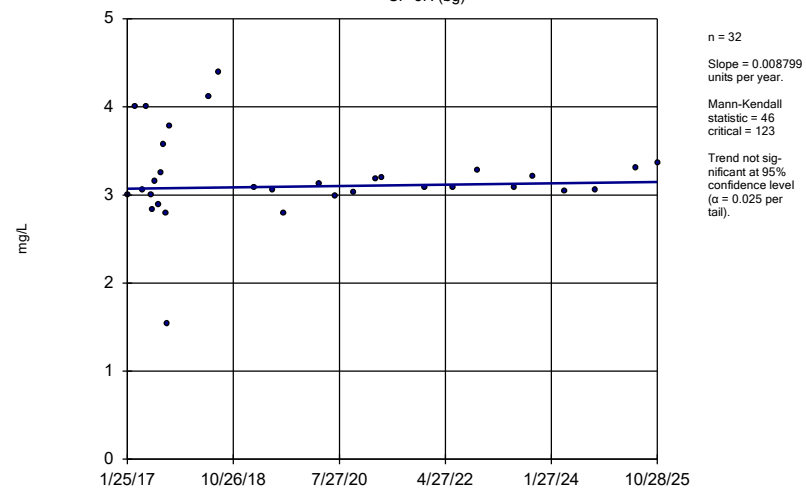
SP-4 (bg)



Constituent: Fluoride Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

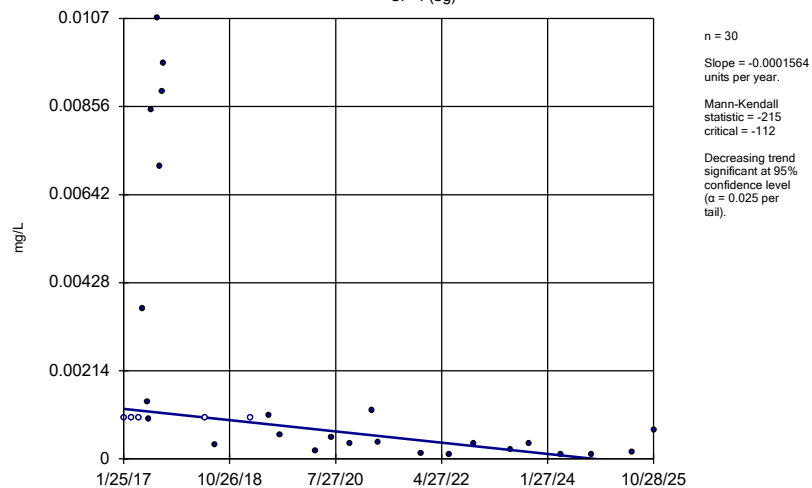
SP-5R (bg)



Constituent: Fluoride Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

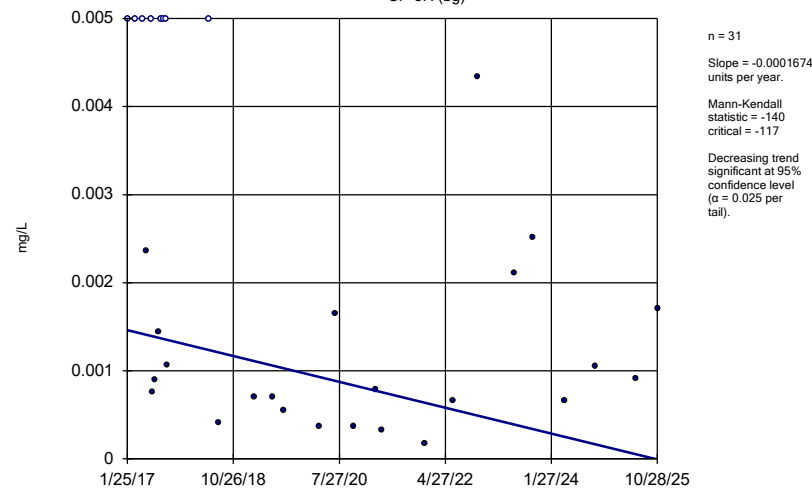
SP-4 (bg)



Constituent: Lead Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

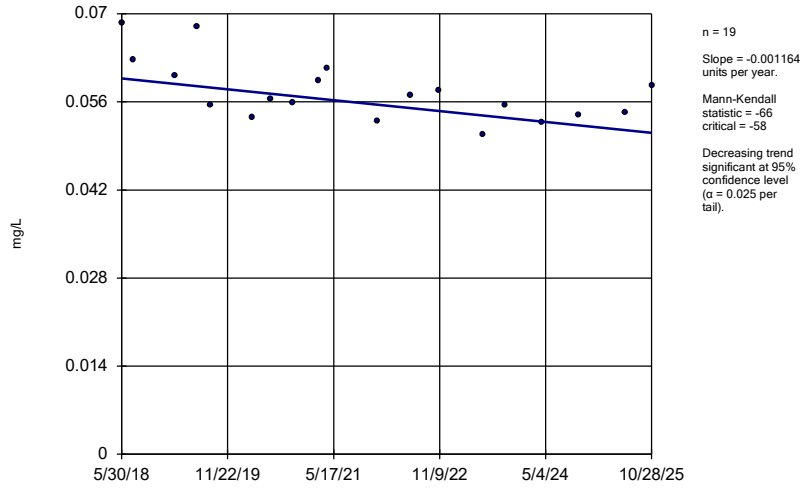
SP-5R (bg)



Constituent: Lead Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

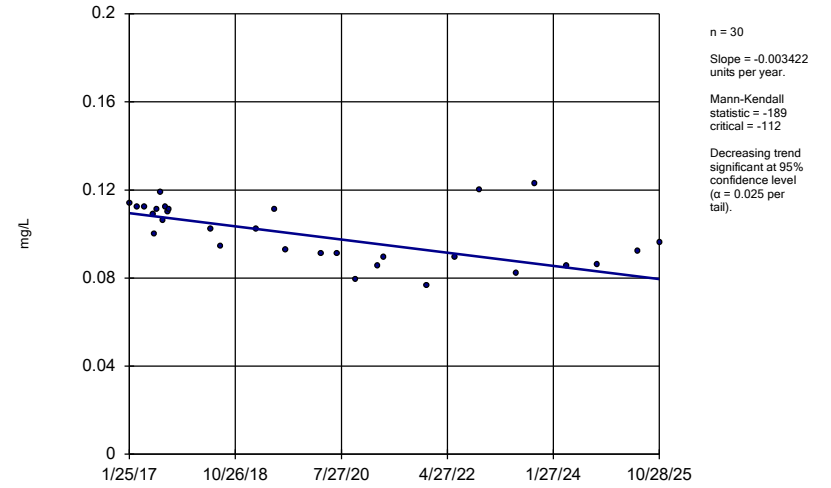
SP-4 (bg)



Constituent: Lithium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

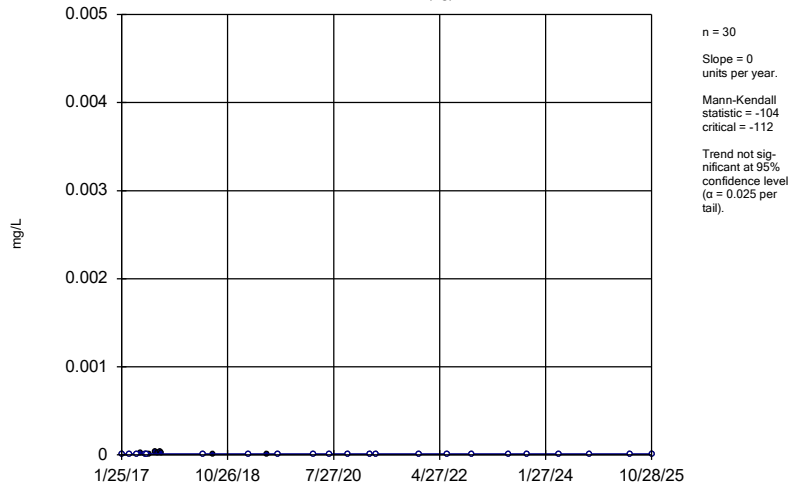
SP-5R (bg)



Constituent: Lithium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

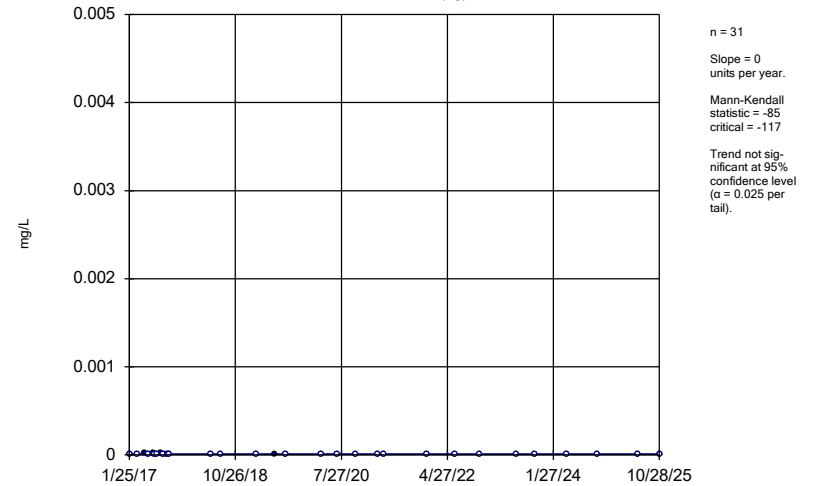
SP-4 (bg)



Constituent: Mercury Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

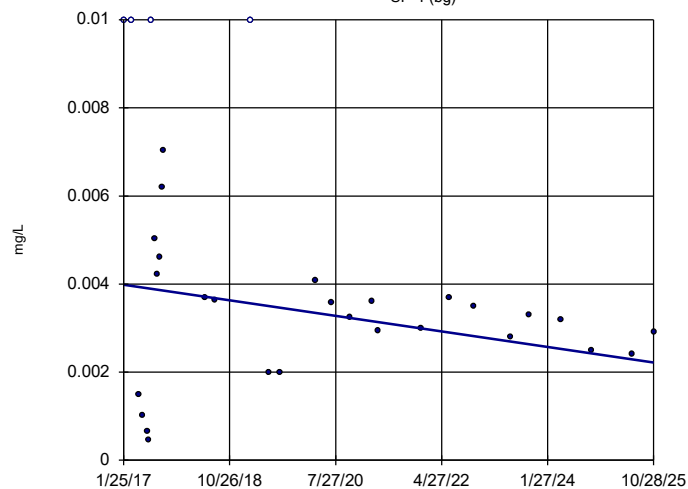
SP-5R (bg)



Constituent: Mercury Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

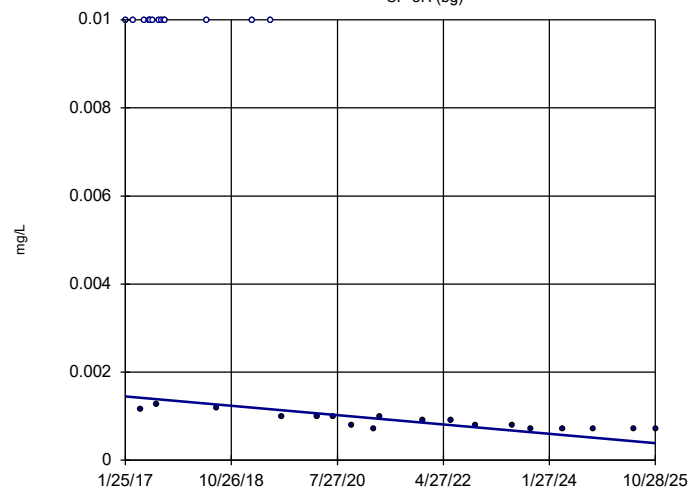


n = 31  
 Slope = -0.0002018  
 units per year.  
 Mann-Kendall  
 statistic = -123  
 critical = -117  
 Decreasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Molybdenum Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

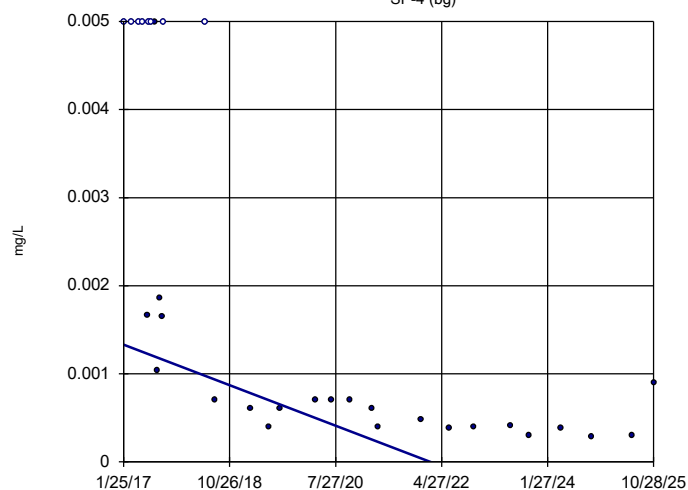


n = 31  
 Slope = -0.0001213  
 units per year.  
 Mann-Kendall  
 statistic = -302  
 critical = -117  
 Decreasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Molybdenum Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

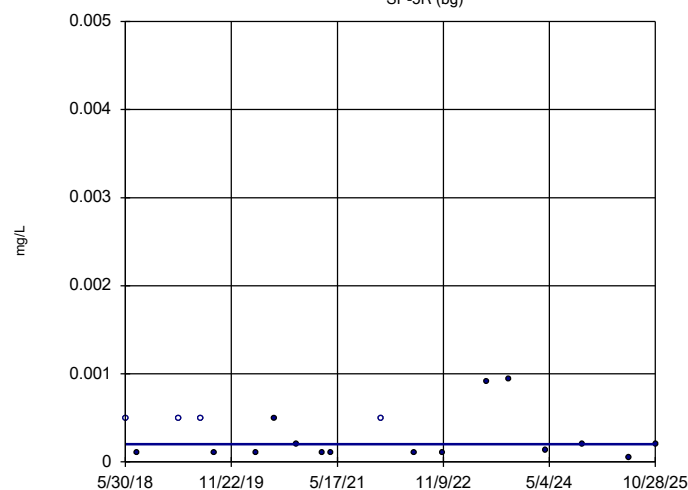


n = 31  
 Slope = -0.0002623  
 units per year.  
 Mann-Kendall  
 statistic = -319  
 critical = -117  
 Decreasing trend  
 significant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Selenium Analysis Run 2/5/2026 10:38 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

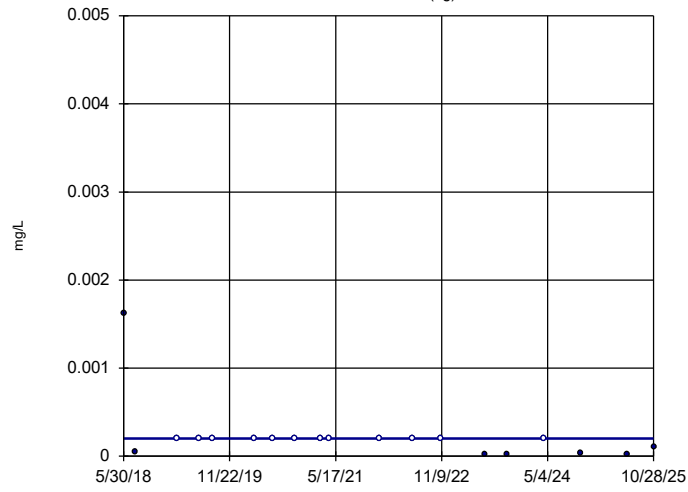
SP-5R (bg)



n = 19  
 Slope = 0  
 units per year.  
 Mann-Kendall  
 statistic = -1  
 critical = -58  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Selenium Analysis Run 2/5/2026 10:39 AM View: Appendix B - Upgradient Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

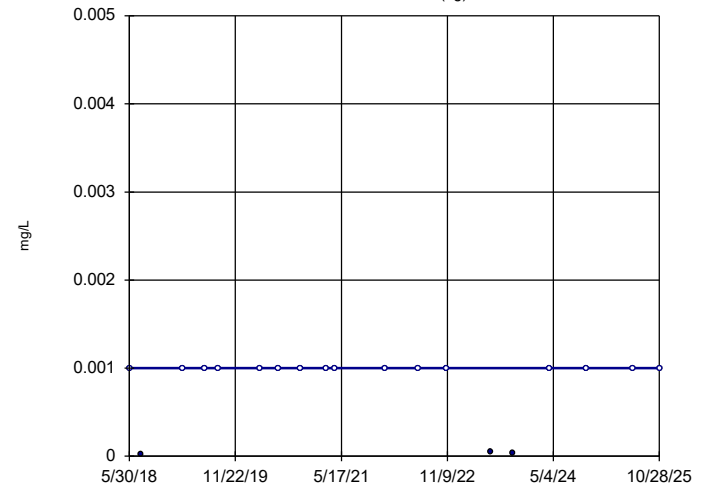
### Sen's Slope Estimator SP-4 (bg)



n = 19  
Slope = 0  
units per year.  
Mann-Kendall  
statistic = -60  
critical = -58  
Decreasing trend  
significant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Thallium Analysis Run 2/5/2026 10:39 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator SP-5R (bg)



n = 19  
Slope = 0  
units per year.  
Mann-Kendall  
statistic = -1  
critical = -58  
Trend not sig-  
nificant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Thallium Analysis Run 2/5/2026 10:39 AM View: Appendix B - Upgradient Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

# Cobalt SP-4 Trend Test - All/Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/30/2026, 2:39 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (mg/L)	SP-4 (bg)	-0.0001118	-154	-112	Yes	30	10	n/a	n/a	0.05	NP



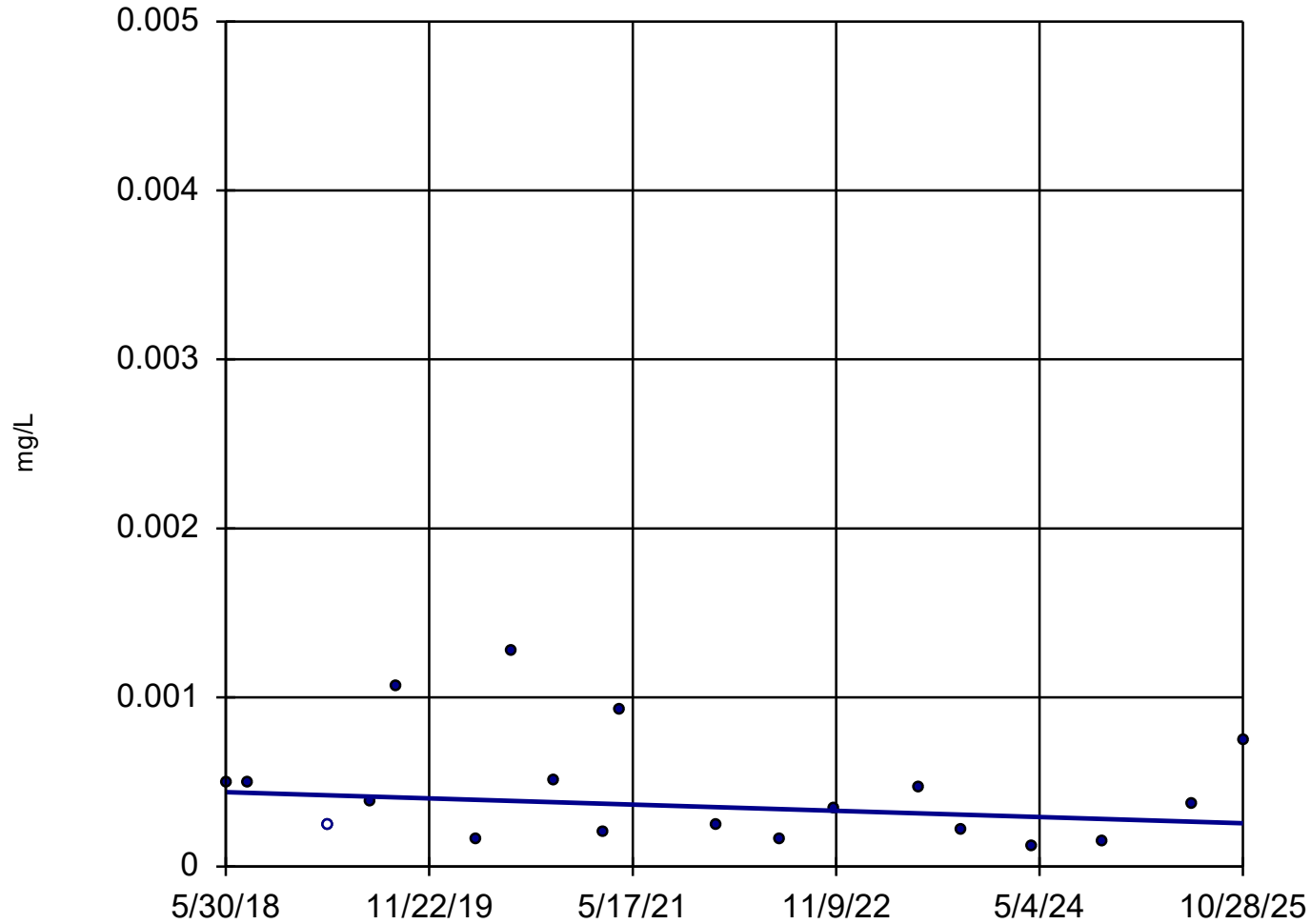
# Cobalt SP-4 Trend Test - Truncated Record - All Results (No Significant)

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 1/30/2026, 2:40 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (mg/L)	SP-4 (bg)	-0.00002472	-37	-58	No	19	5.263	n/a	n/a	0.05	NP

## Sen's Slope Estimator

SP-4 (bg)



n = 19

Slope = -0.00002472  
units per year.

Mann-Kendall  
statistic = -37  
critical = -58

Trend not sig-  
nificant at 95%  
confidence level  
( $\alpha = 0.025$  per  
tail).

Constituent: Cobalt Analysis Run 1/30/2026 2:40 PM View: Check  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

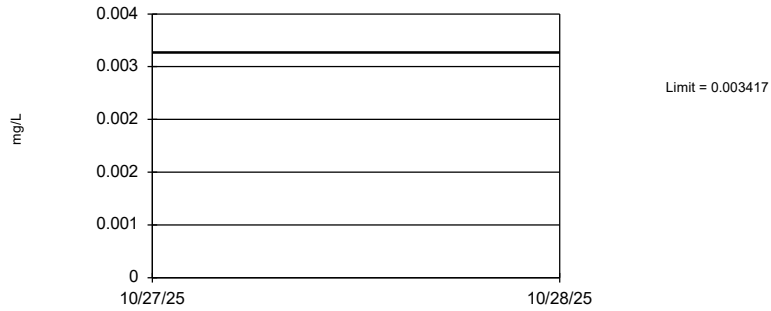
FIGURE H  
UTLs

# Upper Tolerance Limits

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/5/2026, 10:28 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.003417	n/a	n/a	n/a	62	27.42	ln(x)	0.05	Inter
Arsenic (mg/L)	n/a	0.0599	n/a	n/a	n/a	61	4.918	n/a	0.04377	NP Inter(normality)
Barium (mg/L)	n/a	2.77	n/a	n/a	n/a	50	0	n/a	0.07694	NP Inter(normality)
Beryllium (mg/L)	n/a	0.00212	n/a	n/a	n/a	61	18.03	n/a	0.04377	NP Inter(normality)
Cadmium (mg/L)	n/a	0.0001315	n/a	n/a	n/a	38	18.42	sqrt(x)	0.05	Inter
Chromium (mg/L)	n/a	0.00571	n/a	n/a	n/a	50	10	n/a	0.07694	NP Inter(normality)
Cobalt (mg/L)	n/a	0.001752	n/a	n/a	n/a	50	6	sqrt(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	16.19	n/a	n/a	n/a	60	0	n/a	0.04607	NP Inter(normality)
Fluoride (mg/L)	n/a	4.39	n/a	n/a	n/a	64	1.563	n/a	0.03752	NP Inter(normality)
Lead (mg/L)	n/a	0.008033	n/a	n/a	n/a	61	21.31	ln(x)	0.05	Inter
Lithium (mg/L)	n/a	0.123	n/a	n/a	n/a	49	0	n/a	0.08099	NP Inter(normality)
Mercury (mg/L)	n/a	0.00003	n/a	n/a	n/a	61	78.69	n/a	0.04377	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.01	n/a	n/a	n/a	62	27.42	n/a	0.04158	NP Inter(normality)
Selenium (mg/L)	n/a	0.00499	n/a	n/a	n/a	50	24	n/a	0.07694	NP Inter(normality)
Thallium (mg/L)	n/a	0.00162	n/a	n/a	n/a	38	73.68	n/a	0.1424	NP Inter(NDs)

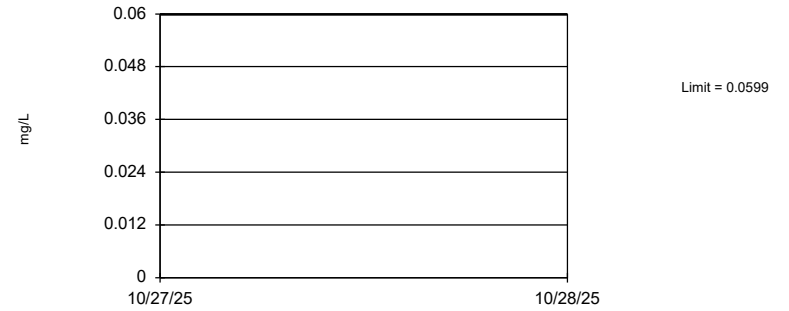
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-8.191, Std. Dev.=1.25, n=62, 27.42% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9541, critical = 0.947. Report alpha = 0.05.

Constituent: Antimony Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

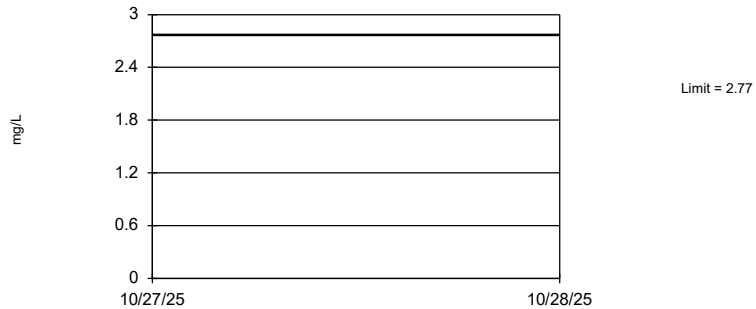
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 61 background values. 4.918% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04377.

Constituent: Arsenic Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

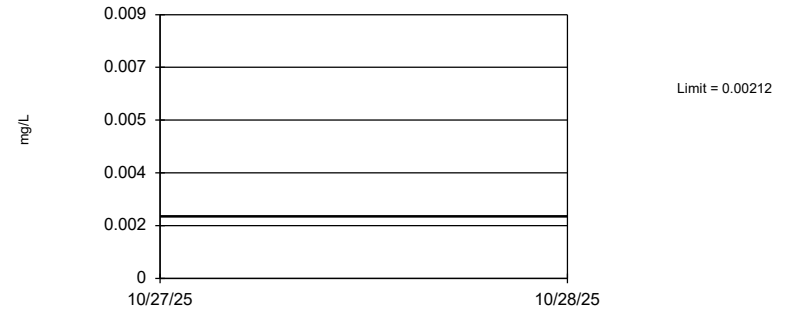
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Barium Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

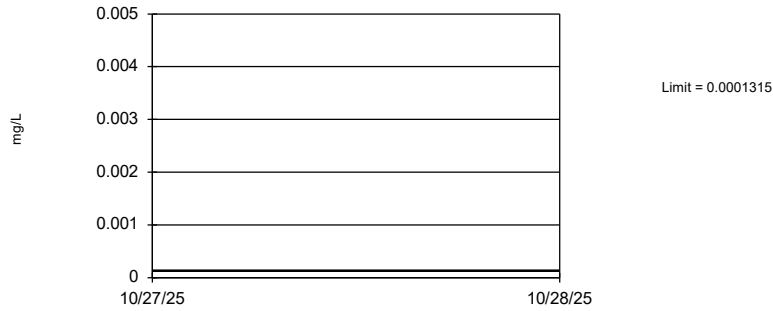
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 61 background values. 18.03% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04377.

Constituent: Beryllium Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

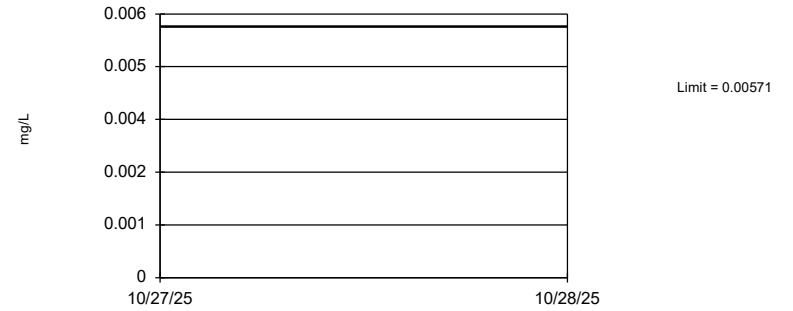
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.00605, Std. Dev.=0.00253, n=38, 18.42% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9168, critical = 0.916. Report alpha = 0.05.

Constituent: Cadmium Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 10% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Chromium Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.02442, Std. Dev.=0.008446, n=50, 6% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.963, critical = 0.935. Report alpha = 0.05.

Constituent: Cobalt Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

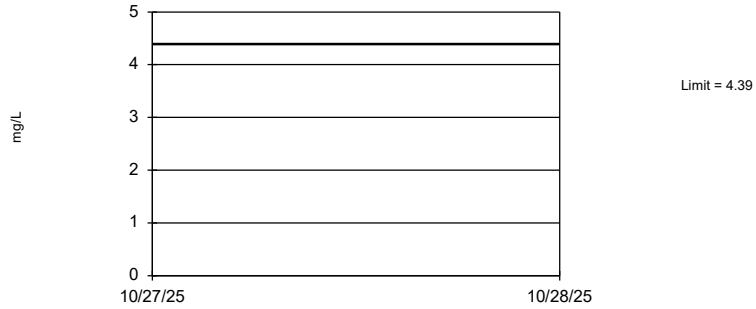
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 60 background values. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04607.

Constituent: Combined Radium 226 + 228 Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

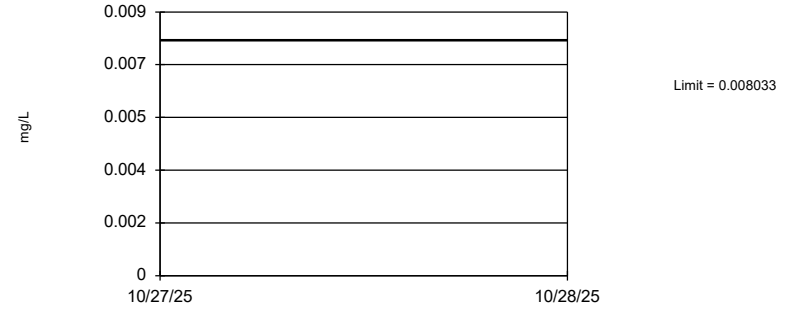
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 64 background values. 1.563% NDs. 93.16% coverage at alpha=0.01; 95.51% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.03752.

Constituent: Fluoride Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

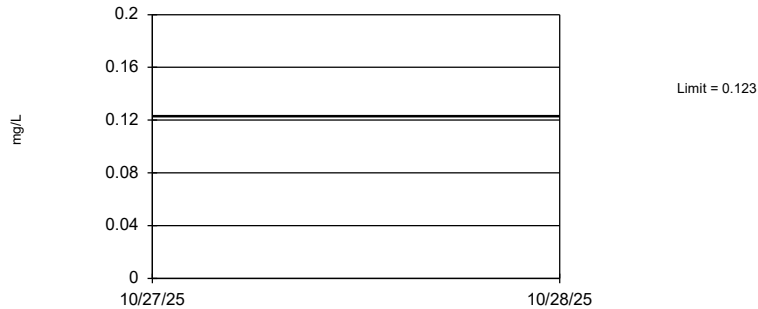
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-7.257, Std. Dev.=1.208, n=61, 21.31% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9481, critical = 0.946. Report alpha = 0.05.

Constituent: Lead Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

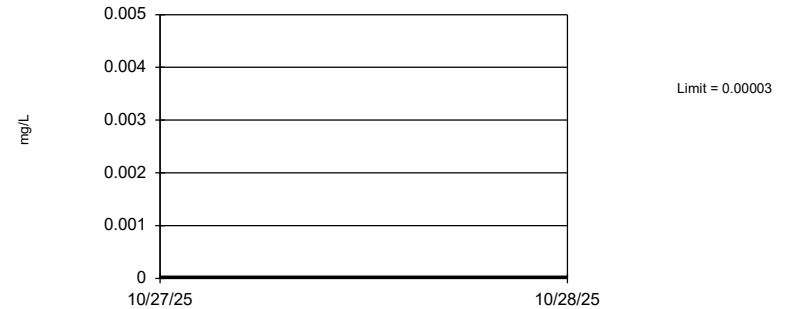
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 49 background values. 91.21% coverage at alpha=0.01; 93.95% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.08099.

Constituent: Lithium Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 61 background values. 78.69% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04377.

Constituent: Mercury Analysis Run 2/5/2026 10:23 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 62 background values. 27.42% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04158.

Constituent: Molybdenum Analysis Run 2/5/2026 10:24 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

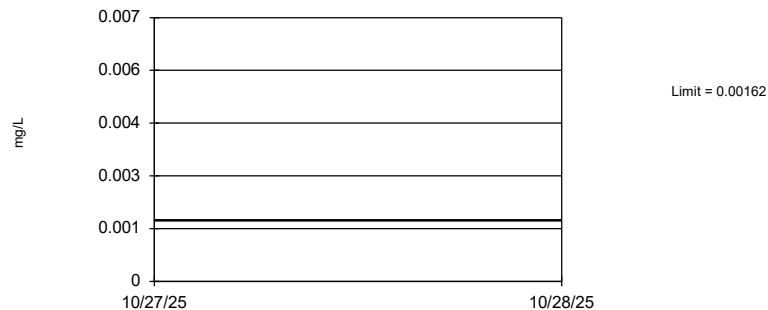
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 24% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Selenium Analysis Run 2/5/2026 10:24 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 38 background values. 73.68% NDs. 88.48% coverage at alpha=0.01; 92.38% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1424.

Constituent: Thallium Analysis Run 2/5/2026 10:24 AM View: Appendix B - UTLs  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

FIGURE I  
GWPS

<b>NORTHEASTERN BAP GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR- Rule Specified Level</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.0034	0.006
Arsenic, Total (mg/L)	0.01		0.06	0.06
Barium, Total (mg/L)	2		2.77	2.77
Beryllium, Total (mg/L)	0.004		0.0021	0.004
Cadmium, Total (mg/L)	0.005		0.00013	0.005
Chromium, Total (mg/L)	0.1		0.0057	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0018	0.006
Combined Radium, Total (pCi/L)	5		16.19	16.19
Fluoride, Total (mg/L)	4		4.39	4.39
Lead, Total (mg/L)	n/a	0.015	0.008	0.015
Lithium, Total (mg/L)	n/a	0.04	0.123	0.123
Mercury, Total (mg/L)	0.002		0.00003	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.01	0.1
Selenium, Total (mg/L)	0.05		0.005	0.05
Thallium, Total (mg/L)	0.002		0.0016	0.002

*\*Grey cell indicates Background Limit is higher than MCL*

*\*GWPS = Groundwater Protection Standard*

*\*MCL = Maximum Contaminant Level*

*\*CCR = Coal Combustion Residuals*

## FIGURE J

Trend Tests – Barium and Combined Radium

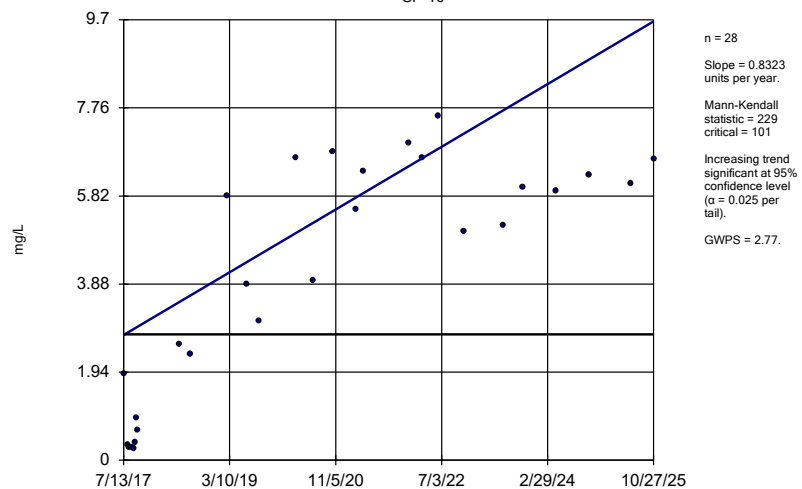
# Barium & Combined Radium SP-10 Trend Tests - All/Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/10/2026, 2:08 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	SP-10	0.8323	229	101	Yes	28	0	n/a	0.05	NP
Combined Radium 226 + 228 (pCi/L)	SP-10	2.65	230	101	Yes	28	0	n/a	0.05	NP

### Sen's Slope Estimator

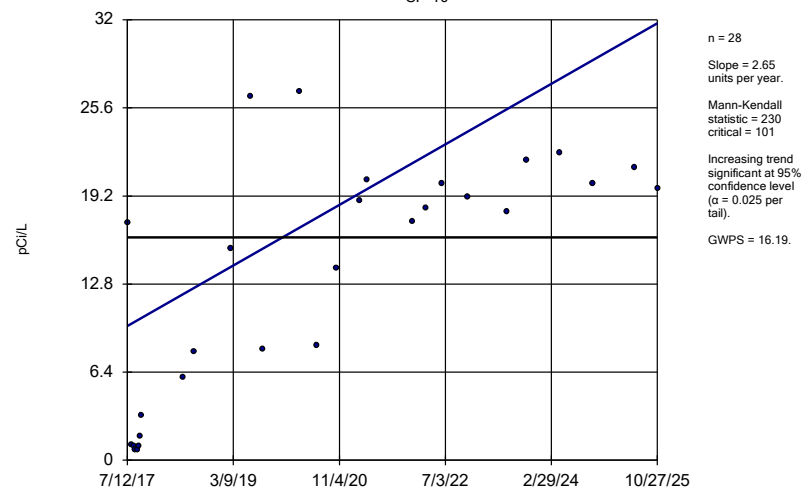
SP-10



Constituent: Barium Analysis Run 2/10/2026 2:07 PM View: Check  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-10



Constituent: Combined Radium 226 + 228 Analysis Run 2/10/2026 2:07 PM View: Check  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

# Barium & Combined Radium SP-10 Trend Tests - Truncated Record - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/10/2026, 2:06 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	SP-10	0.4297	69	62	Yes	20	0	n/a	0.05	NP

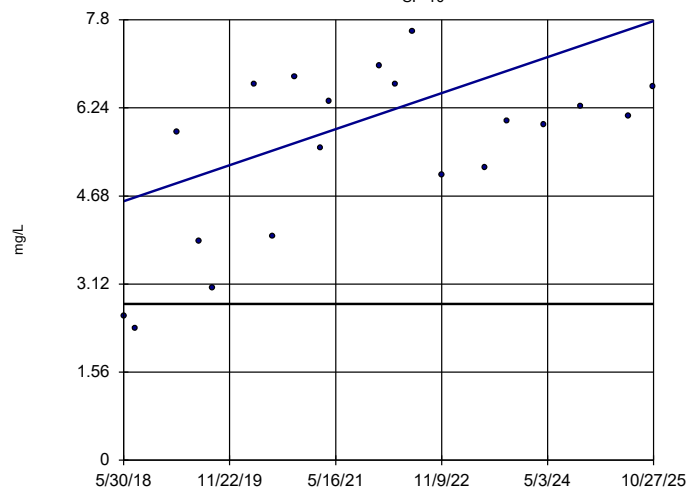
# Barium & Combined Radium SP-10 Trend Tests - Truncated Record - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/10/2026, 2:06 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
<b>Barium (mg/L)</b>	<b>SP-10</b>	<b>0.4297</b>	<b>69</b>	<b>62</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
Combined Radium 226 + 228 (pCi/L)	SP-10	0.2869	4	17	No	8	0	n/a	0.05	NP

### Sen's Slope Estimator

SP-10

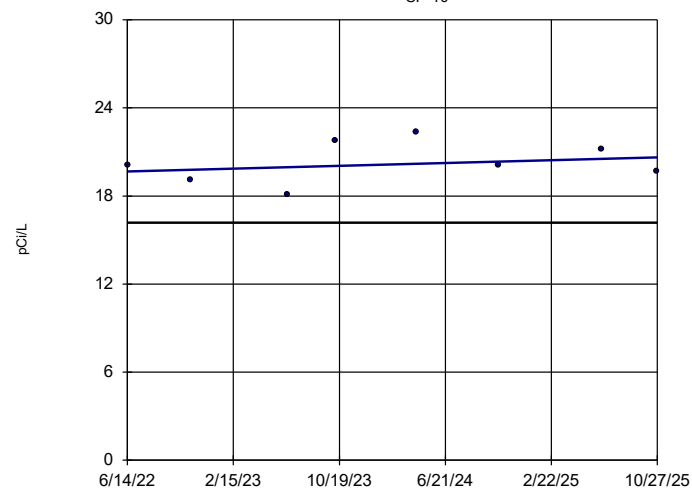


n = 20  
 Slope = 0.4297 units per year.  
 Mann-Kendall statistic = 69  
 critical = 62  
 Increasing trend significant at 95% confidence level ( $\alpha = 0.025$  per tail).  
 GWPS = 2.77.

Constituent: Barium Analysis Run 2/10/2026 2:05 PM View: Check  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-10



n = 8  
 Slope = 0.2869 units per year.  
 Mann-Kendall statistic = 4  
 critical = 17  
 Trend not significant at 95% confidence level ( $\alpha = 0.025$  per tail).  
 GWPS = 16.19.

Constituent: Combined Radium 226 + 228 Analysis Run 2/10/2026 2:05 PM View: Check  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

FIGURE K  
Confidence Intervals

# Confidence Intervals - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/9/2026, 4:08 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	SP-10	6.336	4.599	2.77	Yes	20	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	SP-10	21.81	18.8	16.19	Yes	8	0	No	0.01	Param.
Fluoride (mg/L)	SP-10	6.84	6.29	4.39	Yes	30	10	No	0.01	NP (normality)
Lithium (mg/L)	SP-10	0.2711	0.2341	0.123	Yes	28	0	No	0.01	Param.

# Confidence Intervals - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/9/2026, 4:08 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	SP-1	0.00275	0.00051	0.006	No	31	22.58	No	0.01	NP (normality)
Antimony (mg/L)	SP-10	0.00042	0.00009733	0.006	No	28	17.86	ln(x)	0.01	Param.
Antimony (mg/L)	SP-11	0.0009296	0.0002002	0.006	No	28	10.71	ln(x)	0.01	Param.
Antimony (mg/L)	SP-2	0.002302	0.001188	0.006	No	31	6.452	ln(x)	0.01	Param.
Arsenic (mg/L)	SP-1	0.00211	0.00065	0.06	No	31	25.81	No	0.01	NP (normality)
Arsenic (mg/L)	SP-10	0.002271	0.0005502	0.06	No	28	10.71	ln(x)	0.01	Param.
Arsenic (mg/L)	SP-11	0.004444	0.002321	0.06	No	28	3.571	sqrt(x)	0.01	Param.
Arsenic (mg/L)	SP-2	0.00208	0.00125	0.06	No	31	3.226	No	0.01	NP (normality)
Barium (mg/L)	SP-1	0.1904	0.1578	2.77	No	31	0	sqrt(x)	0.01	Param.
<b>Barium (mg/L)</b>	<b>SP-10</b>	<b>6.336</b>	<b>4.599</b>	<b>2.77</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Barium (mg/L)	SP-11	0.434	0.2133	2.77	No	20	0	No	0.01	Param.
Barium (mg/L)	SP-2	1.307	0.9929	2.77	No	31	0	ln(x)	0.01	Param.
Beryllium (mg/L)	SP-1	0.00014	0.000054	0.004	No	31	19.35	No	0.01	NP (normality)
Beryllium (mg/L)	SP-10	0.000121	0.00003	0.004	No	28	28.57	No	0.01	NP (normality)
Beryllium (mg/L)	SP-11	0.0003	0.000028	0.004	No	28	28.57	No	0.01	NP (normality)
Beryllium (mg/L)	SP-2	0.000121	0.000075	0.004	No	31	12.9	No	0.01	NP (normality)
Cadmium (mg/L)	SP-1	0.00009	0.000051	0.005	No	20	10	No	0.01	NP (normality)
Cadmium (mg/L)	SP-10	0.00002022	0.000008382	0.005	No	20	20	ln(x)	0.01	Param.
Cadmium (mg/L)	SP-11	0.00013	0.00001	0.005	No	28	14.29	No	0.01	NP (normality)
Cadmium (mg/L)	SP-2	0.000328	0.00006	0.005	No	31	32.26	No	0.01	NP (normality)
Chromium (mg/L)	SP-1	0.001027	0.0005493	0.1	No	31	19.35	sqrt(x)	0.01	Param.
Chromium (mg/L)	SP-10	0.0009524	0.0003626	0.1	No	27	11.11	ln(x)	0.01	Param.
Chromium (mg/L)	SP-11	0.00257	0.00043	0.1	No	28	3.571	No	0.01	NP (normality)
Chromium (mg/L)	SP-2	0.001262	0.0005903	0.1	No	31	9.677	x^(1/3)	0.01	Param.
Cobalt (mg/L)	SP-1	0.001073	0.0004771	0.006	No	31	9.677	x^(1/3)	0.01	Param.
Cobalt (mg/L)	SP-10	0.0008646	0.0001844	0.006	No	28	10.71	ln(x)	0.01	Param.
Cobalt (mg/L)	SP-11	0.002873	0.0009567	0.006	No	28	3.571	ln(x)	0.01	Param.
Cobalt (mg/L)	SP-2	0.0009608	0.0004788	0.006	No	31	9.677	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	SP-1	4.341	3.237	16.19	No	30	0	No	0.01	Param.
<b>Combined Radium 226 + 228 (pCi/L)</b>	<b>SP-10</b>	<b>21.81</b>	<b>18.8</b>	<b>16.19</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 + 228 (pCi/L)	SP-11	2.283	1.218	16.19	No	27	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	SP-2	12.78	8.34	16.19	No	28	0	sqrt(x)	0.01	Param.
Fluoride (mg/L)	SP-1	0.9436	0.731	4.39	No	31	6.452	No	0.01	Param.
<b>Fluoride (mg/L)</b>	<b>SP-10</b>	<b>6.84</b>	<b>6.29</b>	<b>4.39</b>	<b>Yes</b>	<b>30</b>	<b>10</b>	<b>No</b>	<b>0.01</b>	<b>NP (normality)</b>
Fluoride (mg/L)	SP-11	3.012	2.151	4.39	No	30	0	No	0.01	Param.
Fluoride (mg/L)	SP-2	3.08	2.7	4.39	No	32	0	No	0.01	NP (normality)
Lead (mg/L)	SP-1	0.00247	0.000259	0.015	No	31	25.81	No	0.01	NP (normality)
Lead (mg/L)	SP-10	0.0002294	0.00009999	0.015	No	20	15	sqrt(x)	0.01	Param.
Lead (mg/L)	SP-11	0.001188	0.0003011	0.015	No	28	10.71	ln(x)	0.01	Param.
Lead (mg/L)	SP-2	0.00202	0.000245	0.015	No	31	29.03	No	0.01	NP (normality)
Lithium (mg/L)	SP-1	0.006421	0.004993	0.123	No	30	0	No	0.01	Param.
<b>Lithium (mg/L)</b>	<b>SP-10</b>	<b>0.2711</b>	<b>0.2341</b>	<b>0.123</b>	<b>Yes</b>	<b>28</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Lithium (mg/L)	SP-11	0.03608	0.02173	0.123	No	20	0	No	0.01	Param.
Lithium (mg/L)	SP-2	0.07668	0.05386	0.123	No	31	0	No	0.01	Param.
Mercury (mg/L)	SP-1	0.000009	0.000005	0.002	No	31	80.65	No	0.01	NP (NDs)
Mercury (mg/L)	SP-10	0.00001	0.000005	0.002	No	28	64.29	No	0.01	NP (NDs)
Mercury (mg/L)	SP-11	0.00005	0.000009	0.002	No	28	53.57	No	0.01	NP (NDs)
Mercury (mg/L)	SP-2	0.000005	0.000005	0.002	No	31	87.1	No	0.01	NP (NDs)
Molybdenum (mg/L)	SP-1	0.01687	0.012	0.1	No	31	0	No	0.01	Param.
Molybdenum (mg/L)	SP-10	0.007833	0.001326	0.1	No	27	7.407	ln(x)	0.01	Param.
Molybdenum (mg/L)	SP-11	0.03616	0.0018	0.1	No	28	3.571	No	0.01	NP (normality)
Molybdenum (mg/L)	SP-2	0.0222	0.01623	0.1	No	20	0	No	0.01	Param.
Selenium (mg/L)	SP-1	0.006668	0.004141	0.05	No	31	9.677	sqrt(x)	0.01	Param.
Selenium (mg/L)	SP-10	0.005	0.0001	0.05	No	28	42.86	No	0.01	NP (normality)
Selenium (mg/L)	SP-11	0.00143	0.0002	0.05	No	28	7.143	No	0.01	NP (normality)

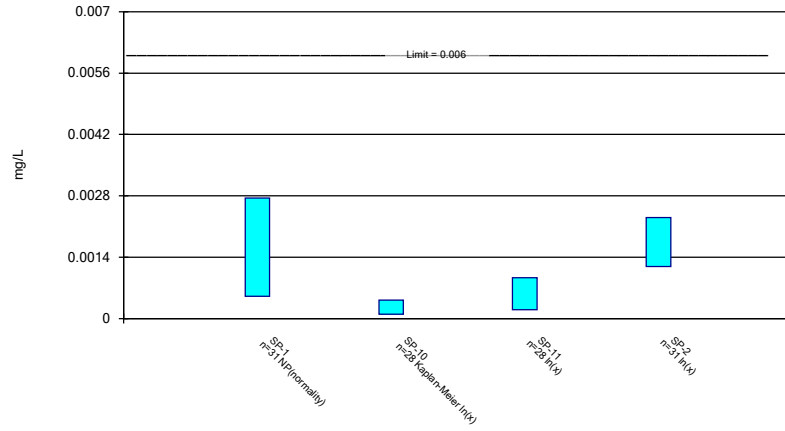
# Confidence Intervals - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/9/2026, 4:08 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Selenium (mg/L)	SP-2	0.004199	0.002055	0.05	No	20	0	sqrt(x)	0.01	Param.
Thallium (mg/L)	SP-1	0.0005	0.00007	0.002	No	20	30	No	0.01	NP (normality)
Thallium (mg/L)	SP-10	0.002	0.00004	0.002	No	20	95	No	0.01	NP (NDs)
Thallium (mg/L)	SP-11	0.001	0.00003	0.002	No	20	95	No	0.01	NP (NDs)
Thallium (mg/L)	SP-2	0.0002	0.00005	0.002	No	20	45	No	0.01	NP (normality)

### Parametric and Non-Parametric (NP) Confidence Interval

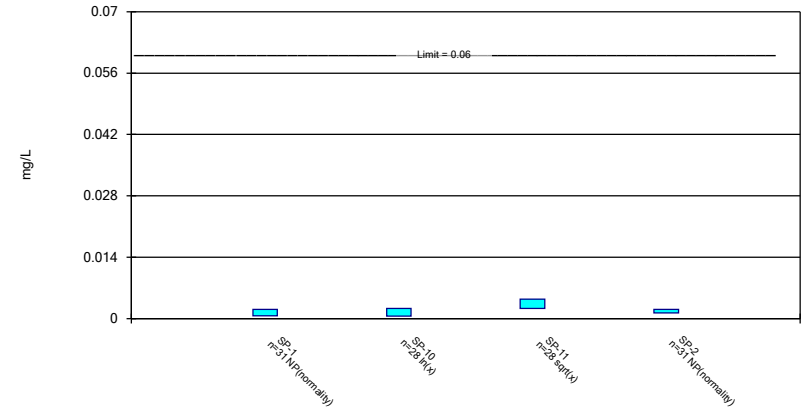
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

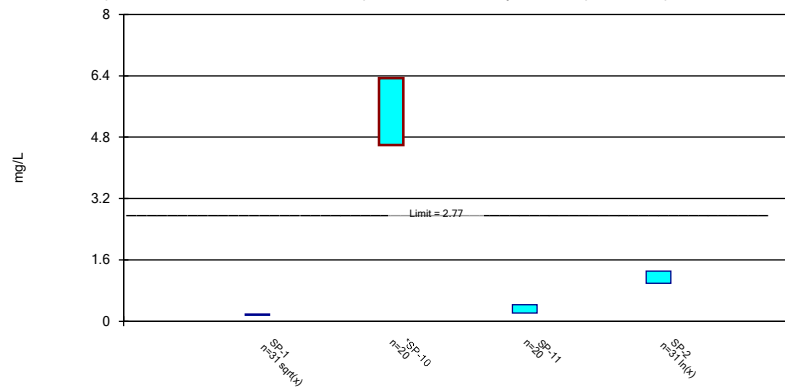
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric Confidence Interval

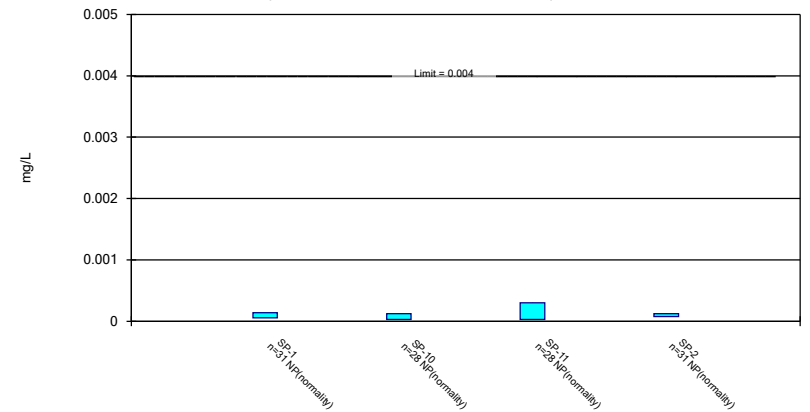
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Non-Parametric Confidence Interval

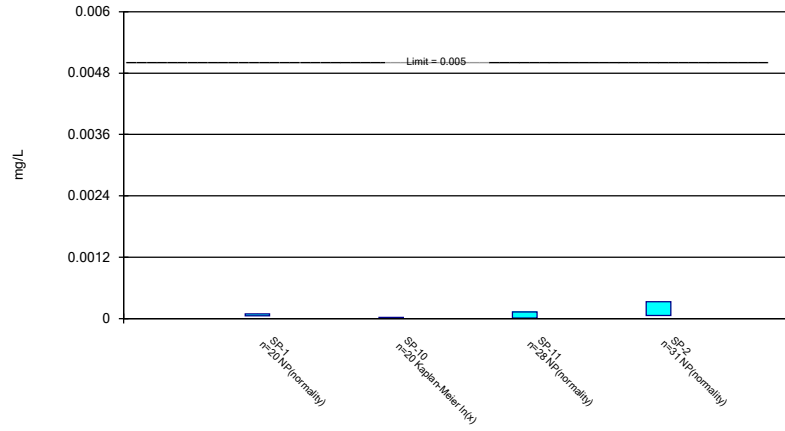
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

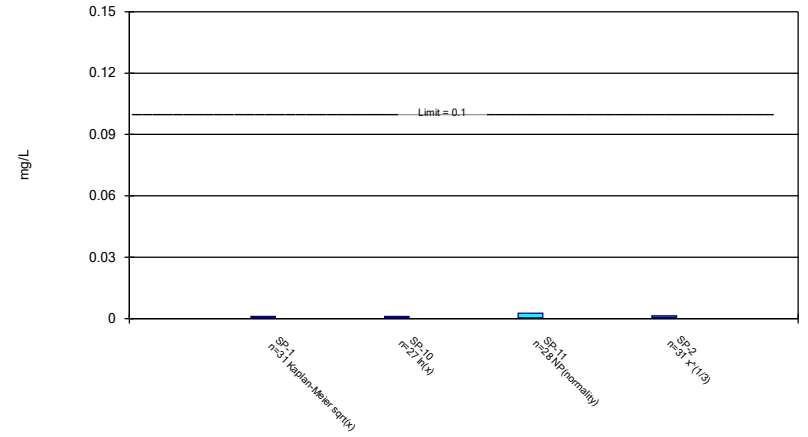
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

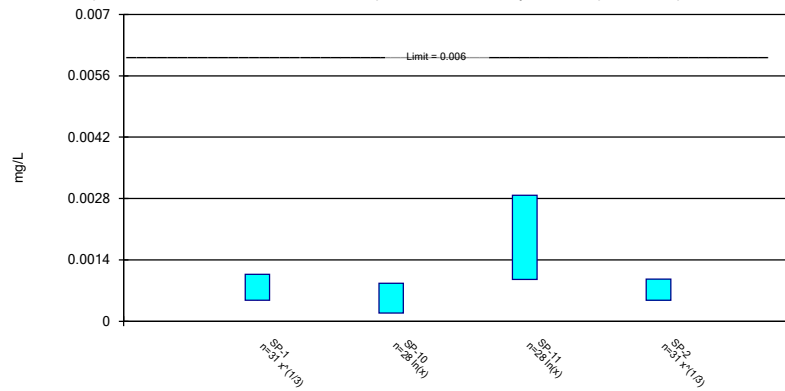
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric Confidence Interval

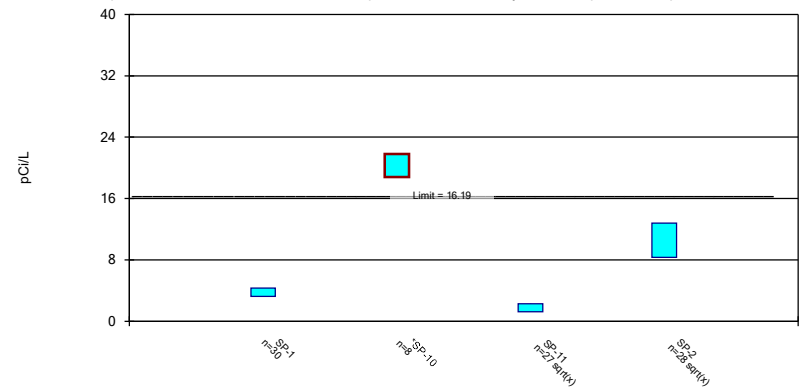
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric Confidence Interval

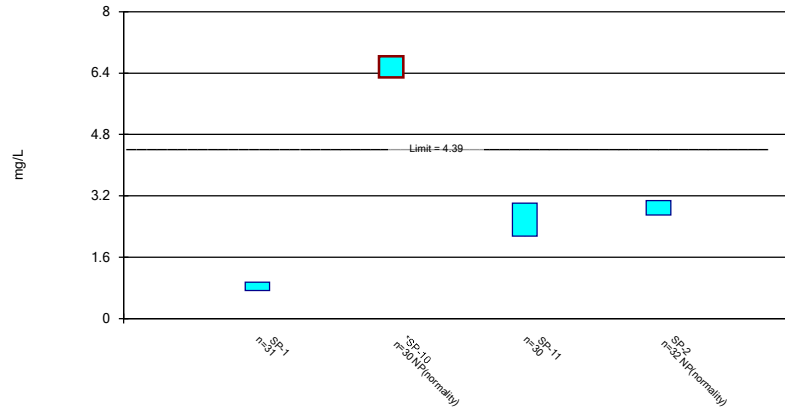
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

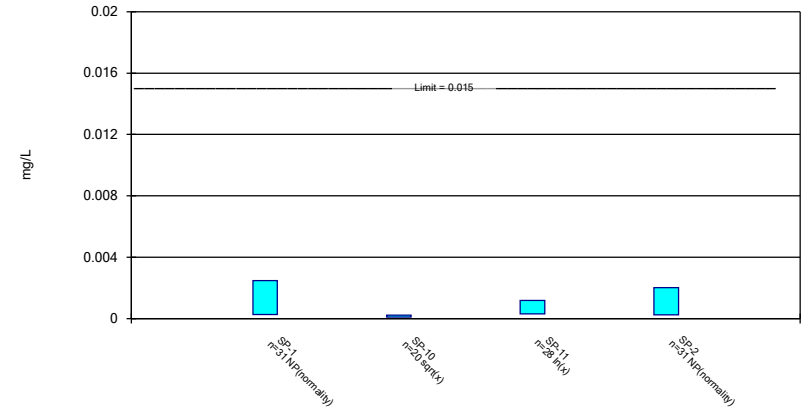
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

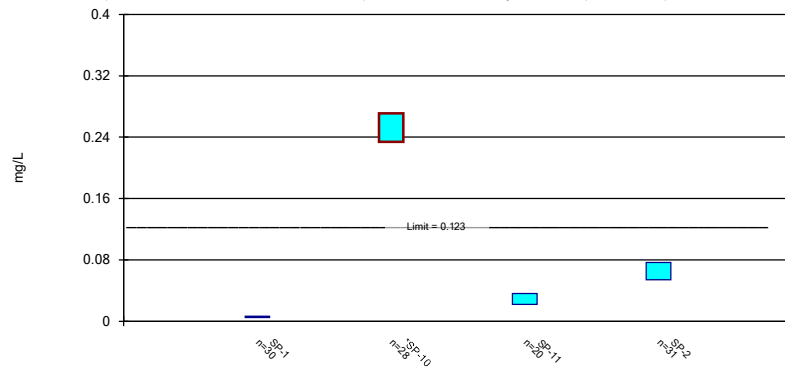
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric Confidence Interval

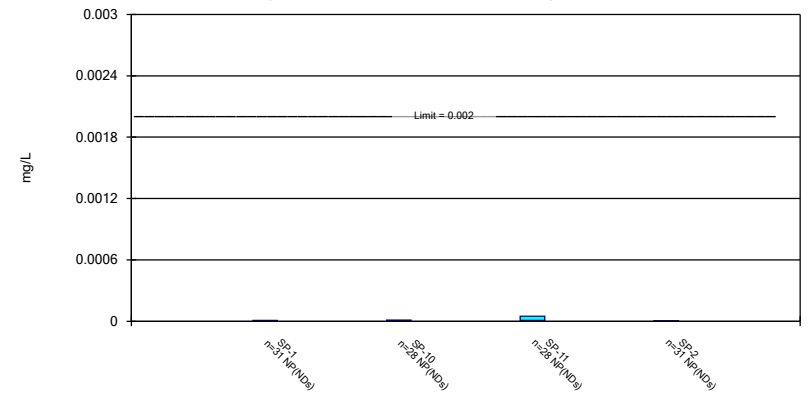
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Non-Parametric Confidence Interval

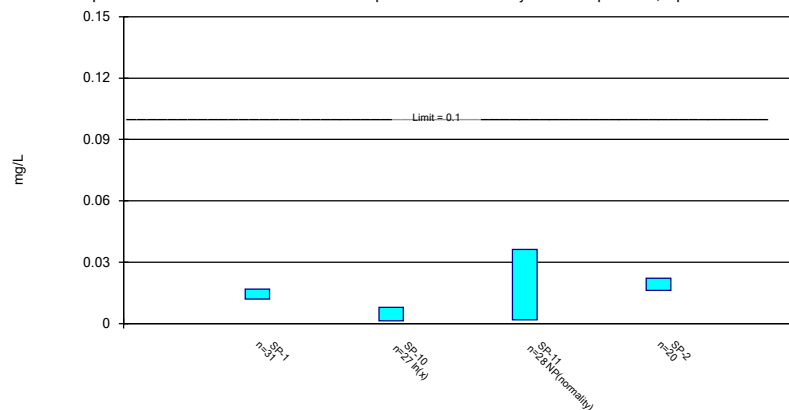
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

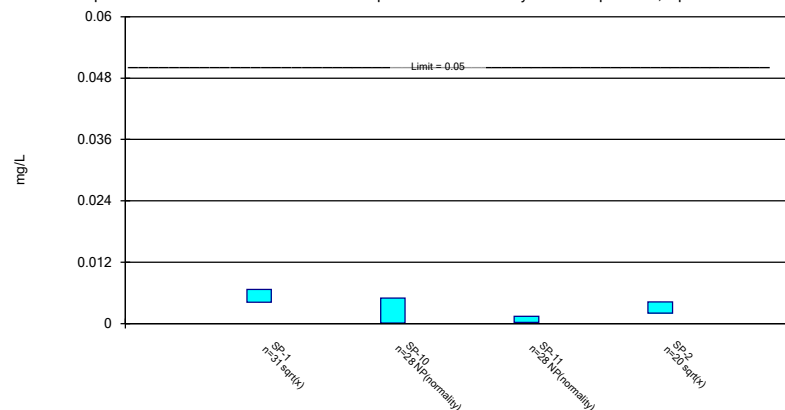
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Parametric and Non-Parametric (NP) Confidence Interval

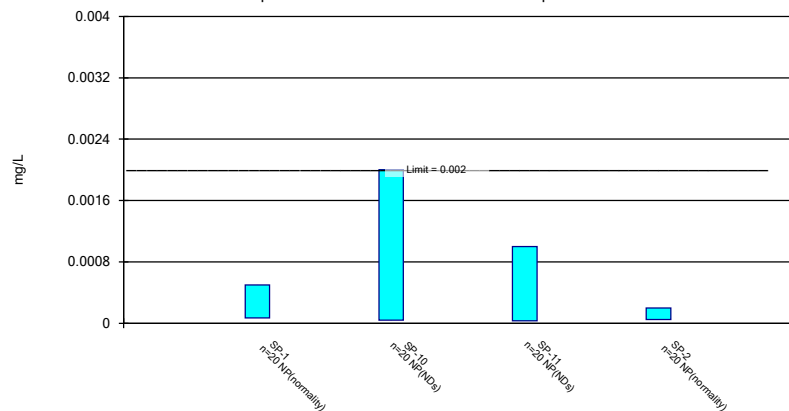
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium Analysis Run 2/9/2026 4:05 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 2/9/2026 4:06 PM View: Appendix B - Confidence Intervals  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

## FIGURE L

Trend Tests – Confidence Interval Exceedances

# Appendix B Trend Tests - Confidence Interval Exceedances - Significant Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/11/2026, 3:47 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	SP-10	0.8323	229	101	Yes	28	0	n/a	0.05	NP
Barium (mg/L)	SP-4 (bg)	-0.01674	-76	-58	Yes	19	0	n/a	0.05	NP
Barium (mg/L)	SP-5R (bg)	0.05443	183	117	Yes	31	0	n/a	0.05	NP
Combined Radium 226 + 228 (pCi/L)	SP-10	2.65	230	101	Yes	28	0	n/a	0.05	NP
Lithium (mg/L)	SP-10	-0.01009	-189	-101	Yes	28	0	n/a	0.05	NP
Lithium (mg/L)	SP-4 (bg)	-0.001164	-66	-58	Yes	19	0	n/a	0.05	NP
Lithium (mg/L)	SP-5R (bg)	-0.003422	-189	-112	Yes	30	0	n/a	0.05	NP

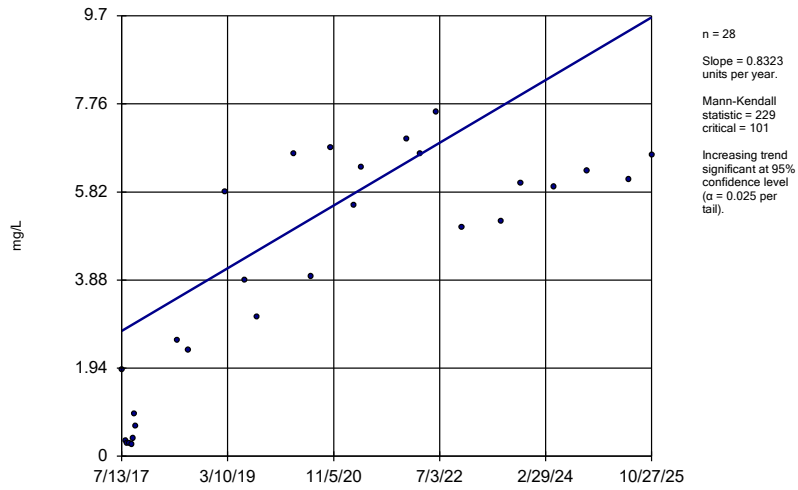
# Appendix B Trend Tests - Confidence Interval Exceedances - All Results

Northeastern BAP Client: Geosyntec Data: Northeastern BAP Printed 2/11/2026, 3:47 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
<b>Barium (mg/L)</b>	<b>SP-10</b>	<b>0.8323</b>	<b>229</b>	<b>101</b>	<b>Yes</b>	<b>28</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
<b>Barium (mg/L)</b>	<b>SP-4 (bg)</b>	<b>-0.01674</b>	<b>-76</b>	<b>-58</b>	<b>Yes</b>	<b>19</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
<b>Barium (mg/L)</b>	<b>SP-5R (bg)</b>	<b>0.05443</b>	<b>183</b>	<b>117</b>	<b>Yes</b>	<b>31</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
<b>Combined Radium 226 + 228 (pCi/L)</b>	<b>SP-10</b>	<b>2.65</b>	<b>230</b>	<b>101</b>	<b>Yes</b>	<b>28</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
Combined Radium 226 + 228 (pCi/L)	SP-4 (bg)	-0.0987	-75	-112	No	30	0	n/a	0.05	NP
Combined Radium 226 + 228 (pCi/L)	SP-5R (bg)	0.1589	46	112	No	30	0	n/a	0.05	NP
Fluoride (mg/L)	SP-10	0.1162	85	112	No	30	10	n/a	0.05	NP
Fluoride (mg/L)	SP-4 (bg)	-0.001762	-9	-123	No	32	3.125	n/a	0.05	NP
Fluoride (mg/L)	SP-5R (bg)	0.008799	46	123	No	32	0	n/a	0.05	NP
<b>Lithium (mg/L)</b>	<b>SP-10</b>	<b>-0.01009</b>	<b>-189</b>	<b>-101</b>	<b>Yes</b>	<b>28</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
<b>Lithium (mg/L)</b>	<b>SP-4 (bg)</b>	<b>-0.001164</b>	<b>-66</b>	<b>-58</b>	<b>Yes</b>	<b>19</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>
<b>Lithium (mg/L)</b>	<b>SP-5R (bg)</b>	<b>-0.003422</b>	<b>-189</b>	<b>-112</b>	<b>Yes</b>	<b>30</b>	<b>0</b>	<b>n/a</b>	<b>0.05</b>	<b>NP</b>

### Sen's Slope Estimator

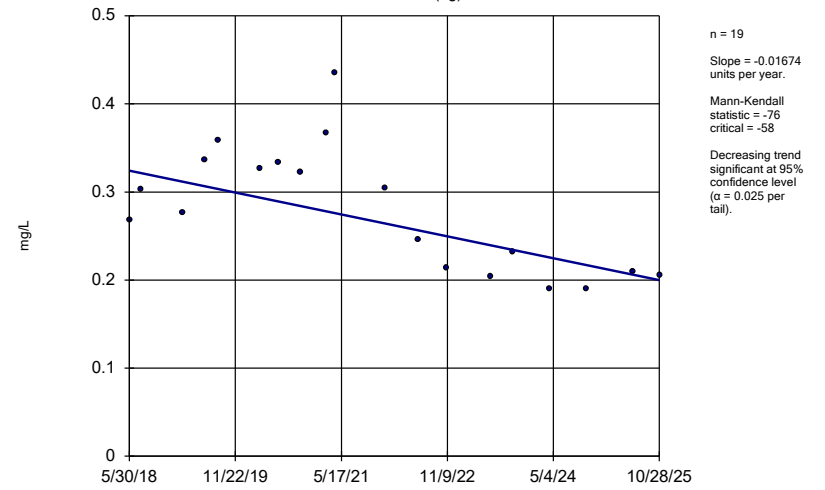
SP-10



Constituent: Barium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

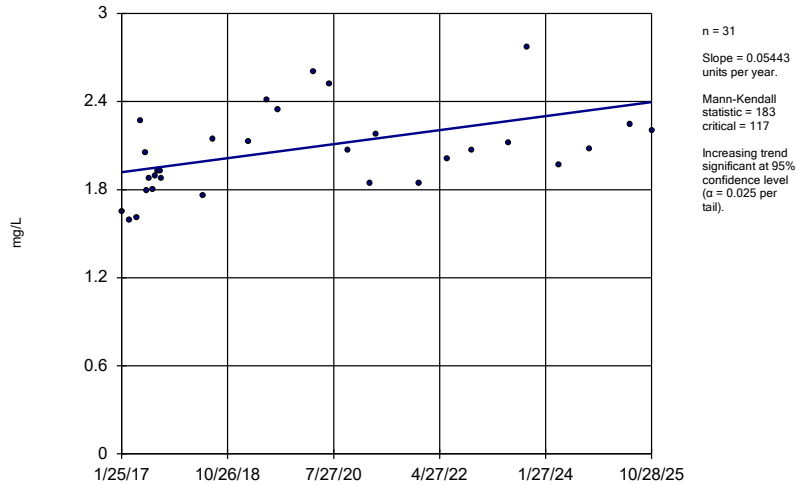
SP-4 (bg)



Constituent: Barium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

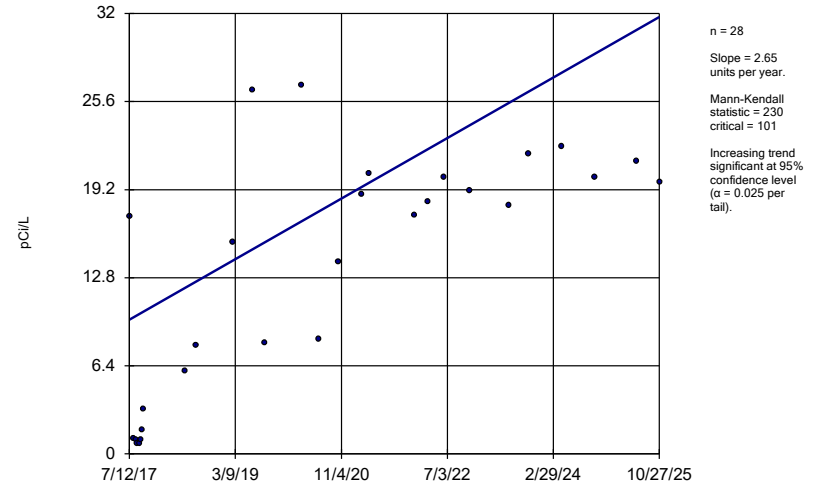
SP-5R (bg)



Constituent: Barium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

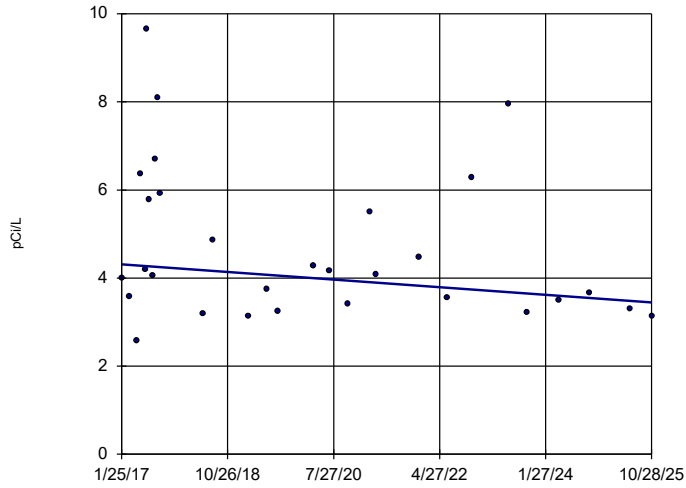
SP-10



Constituent: Combined Radium 226 + 228 Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

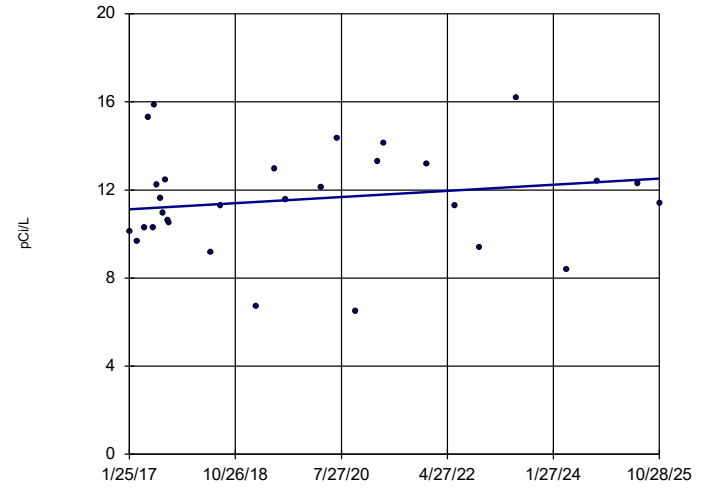


n = 30  
 Slope = -0.0987  
 units per year.  
 Mann-Kendall  
 statistic = -75  
 critical = -112  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Combined Radium 226 + 228 Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tes  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)

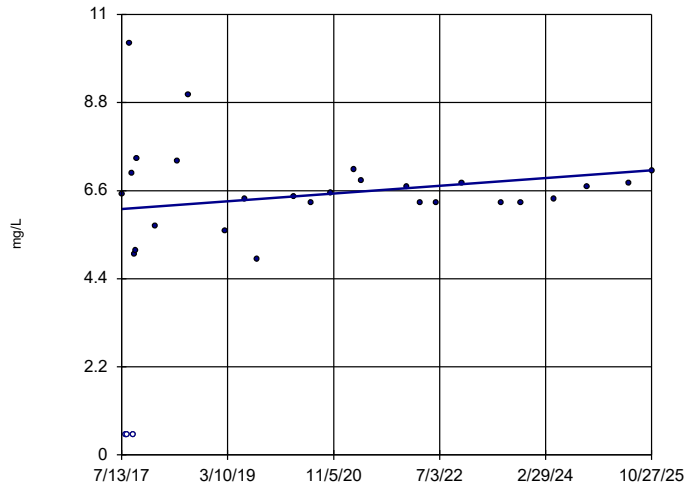


n = 30  
 Slope = 0.1589  
 units per year.  
 Mann-Kendall  
 statistic = 46  
 critical = 112  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Combined Radium 226 + 228 Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tes  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-10

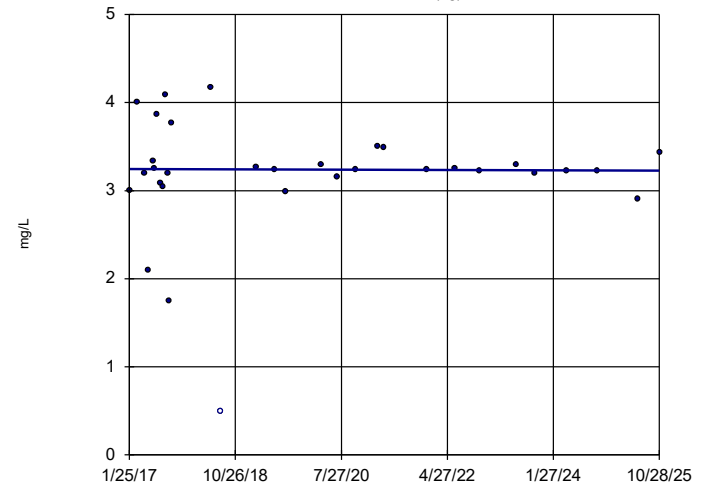


n = 30  
 Slope = 0.1162  
 units per year.  
 Mann-Kendall  
 statistic = 85  
 critical = 112  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Fluoride Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-4 (bg)

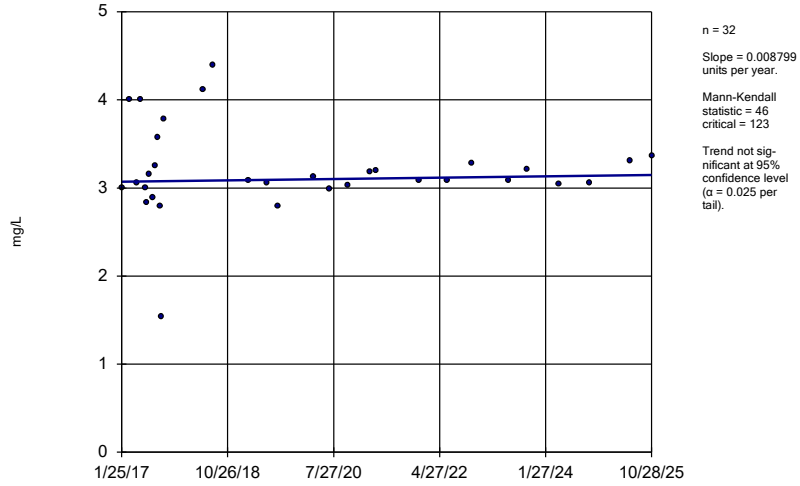


n = 32  
 Slope = -0.001762  
 units per year.  
 Mann-Kendall  
 statistic = -9  
 critical = -123  
 Trend not sig-  
 nificant at 95%  
 confidence level  
 ( $\alpha = 0.025$  per  
 tail).

Constituent: Fluoride Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
 Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

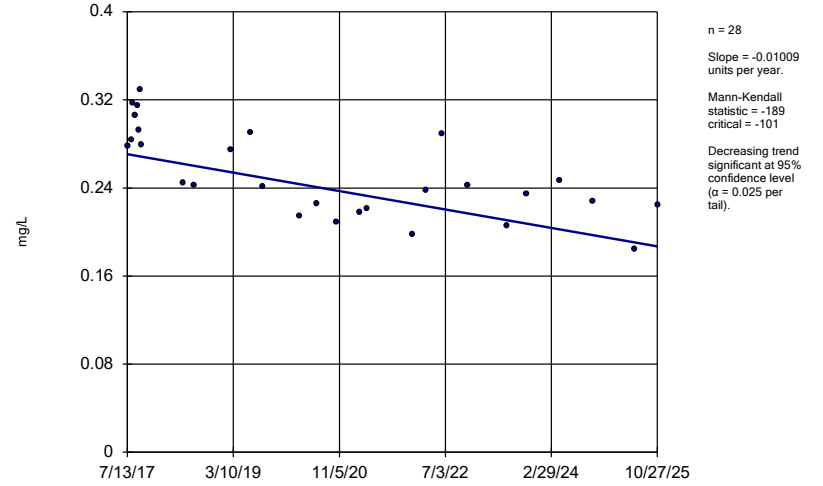
SP-5R (bg)



Constituent: Fluoride Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

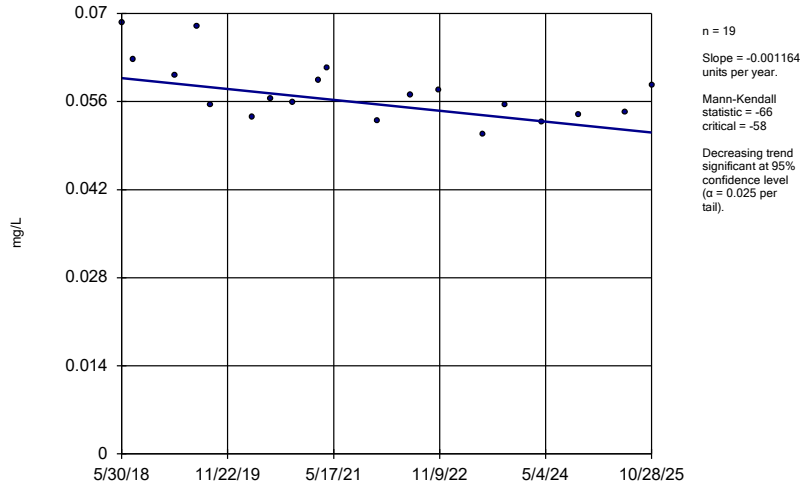
SP-10



Constituent: Lithium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

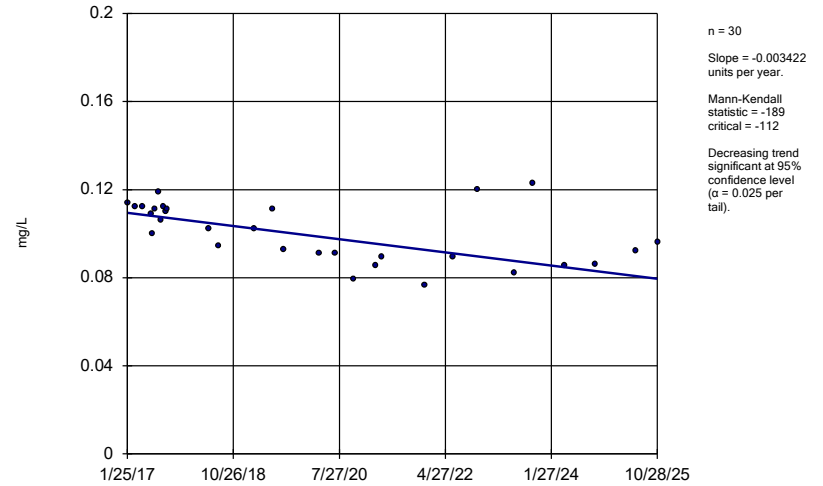
SP-4 (bg)



Constituent: Lithium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

### Sen's Slope Estimator

SP-5R (bg)



Constituent: Lithium Analysis Run 2/11/2026 3:45 PM View: Appendix B - Trend Tests  
Northeastern BAP Client: Geosyntec Data: Northeastern BAP

## **Attachment B**

Laboratory Analytical Report – SPLP Leachate



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

**Water Analysis**

**Location: Northeastern Station**

**Report Date: 11/23/2020**

**Ash SPLP**

**Sample Number: 203057-001**

**Date Collected: 10/20/2020 16:00**

**Date Received: 10/23/2020**

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	4.89	pCi/L	0.19	0.43	ttp	11/18/2020	SW-846 9320-2014, Rev. 1.0
Radium-226	0.0242	pCi/L	0.049	0.24	ttp	11/20/2020	SW-846 9315-1986, Rev. 0

*\*The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.*

**Dan Musgrave, Chemist Principal**

Email [damusgrave@aep.com](mailto:damusgrave@aep.com) Tel. 614-836-4282

Fax 614-836-4168 Audinet 8-210-4282

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

## **Attachment C**

Certification by Qualified Professional Engineer

**CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER**

I certify that the above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Bottom Ash Pond CCR management area at the Northeastern Power Station and that the requirements of OAC 252:517-9-6(g)(3)(B) have been met.

Beth Ann Gross  
Printed Name of Licensed Professional Engineer

Beth Ann Gross  
Signature



Geosyntec Consultants  
2039 Centre Pointe Boulevard, Suite 103  
Tallahassee, Florida 32308

Oklahoma Firm Certificate of  
Authorization No. 1996  
Exp. 6/30/2026

18167  
License Number

Oklahoma  
Licensing State

May 21, 2026  
Date

\* \* \* \* \*