

STATISTICAL ANALYSIS SUMMARY
BOTTOM ASH POND
Mountaineer Plant
New Haven, West Virginia

Submitted to



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Submitted by



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LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	Alternative Source Demonstration
BAP	Bottom Ash Pond
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
RSL	Regional Screening Level
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit

SECTION 1

EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Mountaineer Power Plant located in New Haven, West Virginia.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, total dissolved solids (TDS), and sulfate at the BAP. An alternate source was not identified at the time, so two assessment monitoring events were conducted at the BAP in 2018, in accordance with 40 CFR 257.95.

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 the usability of the data.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Groundwater protection standards (GWPSs) were established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at a statistically significant level (SSL) above the GWPS. SSLs were identified for lithium. Thus, either the unit will move to an assessment of corrective measures or an alternative source demonstration (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.

SECTION 2

BOTTOM ASH POND EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, two sets of samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(b) and 257.95(d)(1). Samples from both sampling events were analyzed for the Appendix IV parameters, while samples from the second sampling event were also analyzed for Appendix III parameters. A summary of data collected during assessment monitoring may be found in Table 1.

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) samples, and laboratory fortified blanks (LFBs).

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.9.5 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for the BAP were conducted in accordance with the January 2017 *Statistical Analysis Plan* (AEP, 2017), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained to meet the requirements of 40 CFR 257.95(b) and 257.95(d)(1) were screened for potential outliers. No outliers were identified. Outliers identified from the background and detection monitoring events conducted through January 2018 were summarized in a previous report (Geosyntec, 2018).

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (AEP, 2017). The established GWPS was determined to be the greater value of the background concentration and the maximum contaminant level (MCL) or regional screening level (RSL) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events.

Tolerance limits were generally calculated parametrically with 95% coverage and 95% confidence. Non-parametric tolerance limits were calculated for antimony, cadmium, and selenium due to apparent non-normal distributions and for beryllium and mercury due to a high non-detect frequency. Tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

The following SSLs were identified at the Mountaineer BAP:

- LCLs for lithium exceeded the GWPS of 0.04 mg/L at MW-1605D (0.0653 mg/L), MW-1605S (0.0594 mg/L), MW-1606D (0.111 mg/L), MW-1606S (0.102 mg/L), MW-1607D (0.0718 mg/L), MW-1607S (0.0918 mg/L).

As a result, the Mountaineer BAP will either move to an assessment of corrective measures or an alternative source demonstration will be conducted to evaluate if the unit can remain in assessment monitoring.

2.3 Conclusions

Two assessment monitoring events were conducted in 2018 in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the 2018 data. GWPSs were established for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. SSLs were identified for lithium.

Based on this evaluation, the Mountaineer 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.

SECTION 3

REFERENCES

American Electric Power (AEP). 2017. Statistical Analysis Plan – Mountaineer Plant. January 2017.

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Bottom Ash Pond, Mountaineer Plant, New Haven, West Virginia. January 15, 2018.

TABLES

**Table 1 – Groundwater Data Summary
Mountaineer – Bottom Ash Pond**

Parameter	Unit	MW-1601A		MW-1602		MW-1603		MW-1604D		MW-1604S		MW-1605D		MW-1605S	
		5/10/2018	9/20/2018	5/10/2018	9/20/2018	5/10/2018	9/20/2018	5/9/2018	9/19/2018	5/9/2018	9/19/2018	5/9/2018	9/19/2018	5/9/2018	9/19/2018
Antimony	µg/L	0.0300 J	0.0300 J	0.0200 J	0.0100 J	0.0200 J	0.0200 J	0.0400 J	0.0400 J	0.130	0.130	0.0300 J	0.0400 J	0.0400 J	0.0400 J
Arsenic	µg/L	0.550	0.580	0.340	0.320	0.310	0.260	0.340	0.290	0.330	0.320	2.22	2.51	0.500	0.490
Barium	µg/L	63.9	55.3	31.2	26.7	41.3	35.9	32.0	37.0	28.7	26.6	21.6	25.9	23.5	23.1
Beryllium	µg/L	0.02 U	0.02 U	0.00500 J	0.02 U	0.00700 J	0.02 U	0.02 U	0.02 U	0.0240	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Boron	mg/L	-	0.251	-	0.109	-	0.324	-	1.33	-	2.49	-	9.11	-	7.75
Cadmium	µg/L	0.0200 J	0.0200 J	0.0100 J	0.0100 J	0.0100 J	0.0100 J	0.0400	0.0300	0.150	0.150	0.0100 J	0.0200 J	0.0600	0.0500
Calcium	mg/L	-	148	-	81.6	-	167	-	144	-	262	-	278	-	182
Chloride	mg/L	-	51.0	-	10.5	-	14.0	-	41.3	-	109	-	188	-	171
Chromium	µg/L	0.153	0.131	0.121	0.210	0.0990	0.102	0.195	0.169	0.107	0.0930	0.0670	0.229	0.0830	0.644
Cobalt	µg/L	0.0830	0.0590	0.0360	0.0200 J	0.0540	0.0320	0.314	0.203	1.83	1.88	1.51	1.80	0.518	0.360
Combined Radium	pCi/L	0.767	0.696	0.342	0.683	0.363	0.881	0.687	0.316	1.17	1.16	0.523	0.759	0.305	0.347
Fluoride	mg/L	0.160	0.190	0.230	0.250	0.0900 J	0.0900	0.210	0.190	0.220	0.220	0.230	0.220	0.300	0.320
Lead	µg/L	0.0340	0.00500 J	0.0380	0.0100 J	0.0420	0.0200 J	0.0350	0.303	0.0340	0.0200 J	0.0200 J	0.0100 J	0.0560	0.0930
Lithium	mg/L	0.00400	0.00400	0.0150	0.0120	0.0210	0.0220	0.0240	0.0160	0.0510	0.0520	0.0620	0.0600	0.0510	0.0490
Mercury	µg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	µg/L	0.990	0.760	0.710	0.840	0.140	0.0700 J	2.05	1.57	16.2	15.6	46.4	47.9	15.6	15.1
Selenium	µg/L	1.50	1.10	0.100	0.0700 J	0.200	0.400	1.40	3.80	1.00	0.800	0.200	0.300	2.00	1.00
Total Dissolved Solids	mg/L	-	638	-	502	-	920	-	838	-	1500	-	1960	-	1650
Sulfate	mg/L	-	189	-	195	-	524	-	313	-	742	-	972	-	793
Thallium	µg/L	0.0300 J	0.0400 J	0.0300 J	0.0200 J	0.0200 J	0.0100 J	0.0200 J	0.0200 J	0.220	0.251	0.0400 J	0.0500 J	0.0400 J	0.0400 J
pH	SU	7.30	7.14	7.01	7.14	6.55	6.58	7.09	7.21	7.43	7.30	7.46	7.57	7.21	7.35

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Parameter was not present in concentrations above method detection limit and is reported as the reporting limit

J: Estimated value. Parameter was detected in concentrations below the reporting limit

-: Not sampled

**Table 1 – Groundwater Data Summary
Mountaineer – Bottom Ash Pond**

Parameter	Unit	MW-1606D		MW-1606S		MW-1607D		MW-1607S		MW-1608	
		5/9/2018	9/19/2018	5/9/2018	9/19/2018	5/10/2018	9/20/2018	5/10/2018	9/20/2018	5/10/2018	9/20/2018
Antimony	µg/L	0.160	0.150	0.140	0.130	0.0300 J	0.0300 J	0.440	0.420	0.0200 J	0.0300 J
Arsenic	µg/L	0.440	0.380	0.720	0.690	1.15	1.34	0.930	0.900	0.370	0.420
Barium	µg/L	53.0	48.9	73.2	64.8	73.5	92.3	71.1	80.6	46.6	42.6
Beryllium	µg/L	0.02 U	0.00400 J	0.02 U	0.00500 J	0.02 U	0.02 U	0.02 U	0.02 U	0.00900 J	0.02 U
Boron	mg/L	-	7.27	-	5.87	-	2.44	-	1.71	-	0.169
Cadmium	µg/L	0.0700	0.0700	0.0800	0.0600	0.02 U	0.02 U	0.0400	0.0400	0.0100 J	0.00800 J
Calcium	mg/L	-	260	-	199	-	222	-	220	-	128
Chloride	mg/L	-	201	-	219	-	163	-	151	-	6.59
Chromium	µg/L	0.198	0.151	0.0560	0.297	0.0510	0.158	0.121	0.0860	0.126	0.264
Cobalt	µg/L	1.40	1.17	0.318	0.260	0.521	0.769	1.18	0.840	0.0950	0.0520
Combined Radium	pCi/L	0.972	0.438	0.344	0.439	1.25	0.926	1.29	0.584	0.565	0.550
Fluoride	mg/L	0.260	0.260	0.440	0.460	0.540	0.520	0.290	0.280	0.180	0.210
Lead	µg/L	0.115	0.0100 J	0.0400	0.0200 J	0.0430	0.0440	0.128	0.0940	0.0790	0.0370
Lithium	mg/L	0.112	0.107	0.107	0.0960	0.0890	0.104	0.103	0.118	0.000300 J	0.00400
Mercury	µg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	µg/L	70.3	65.3	70.2	70.6	80.9	83.4	43.2	41.5	0.530	1.18
Selenium	µg/L	2.60	3.30	2.00	2.80	0.10 U	0.10 U	11.4	8.80	0.900	1.20
Total Dissolved Solids	mg/L	-	1610	-	1370	-	1450	-	1160	-	572
Sulfate	mg/L	-	722	-	571	-	662	-	478	-	256
Thallium	µg/L	0.0860	0.108	0.0760	0.112	0.0200 J	0.0400 J	0.0640	0.0890	0.0200 J	0.0200 J
pH	SU	7.43	7.19	6.93	7.10	7.54	7.73	7.40	7.57	6.78	7.17

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Parameter was not present in concentrations above method detection limit and is reported as the reporting limit

J: Estimated value. Parameter was detected in concentrations below the reporting limit

-: Not sampled

**Table 2: Groundwater Protection Standards
Mountaineer Plant - Bottom Ash Pond**

Constituent Name	MCL	CCR Rule-Specified	Background Limit
Antimony, Total (mg/L)	0.006		0.0001
Arsenic, Total (mg/L)	0.01		0.00075
Barium, Total (mg/L)	2		0.058
Beryllium, Total (mg/L)	0.004		0.00002
Cadmium, Total (mg/L)	0.005		0.00003
Chromium, Total (mg/L)	0.1		0.0019
Cobalt, Total (mg/L)	n/a	0.006	0.00066
Combined Radium, Total (pCi/L)	5		2.36
Fluoride, Total (mg/L)	4		0.3
Lead, Total (mg/L)	n/a	0.015	0.00052
Lithium, Total (mg/L)	n/a	0.04	0.031
Mercury, Total (mg/L)	0.002		0.000005
Molybdenum, Total (mg/L)	n/a	0.1	0.0029
Selenium, Total (mg/L)	0.05		0.0015
Thallium, Total (mg/L)	0.002		0.000093

Notes:

Grey cell indicates calculated UTL is higher than MCL.

MCL = Maximum Contaminant Level

Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

The higher of the calculated UTL or MCL/RSL is used as the GWPS.

ATTACHMENT A

Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

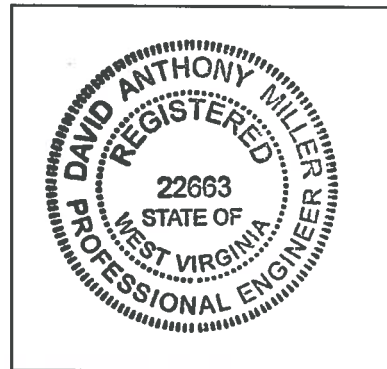
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Mountaineer Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

WEST VIRGINIA

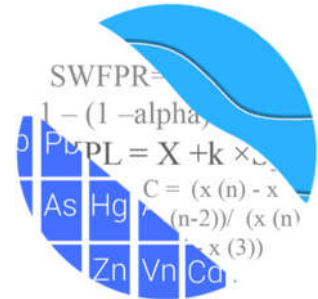
Licensing State

01.08.19

Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING



December 3, 2018

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
941 Chatham Lane, #103
Columbus, OH 43221

Re: Mountaineer BAP
Assessment Monitoring Event – September 2018

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of the September 2018 groundwater data for American Electric Power Inc.'s Mountaineer Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Sampling began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1601A, MW-1602, MW-1603, MW-1608; and
- **Downgradient wells:** MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S.

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 CCR program consists of the following constituents:

- **Appendix III** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS;

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

Time series plots for Appendix III and IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record. Values previously flagged during the screening as outliers may be seen in a lighter font and disconnected symbol on the time series graphs.

Evaluation of Appendix III Parameters

Interwell prediction limits combined with a 1-of-2 verification strategy were constructed for boron, calcium, chloride, fluoride, sulfate and TDS; and intrawell prediction limits combined with a 1-of-2 verification strategy were constructed for pH. The statistical method selected for each parameter was determined based on the results of the screening analysis performed in December 2017.

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of one additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified and further research would be required to identify the cause of the exceedance (i.e. impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is considered a false positive result and, therefore, no further action is necessary. SSIs were noted for several of the Appendix III parameters and the results of those findings may be found in the Prediction Limit Summary tables following this letter.

When a statistically significant increase is identified, the data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing or stable. Upgradient wells are included in the trend analyses to identify whether similar patterns exist upgradient of the site which is an indication of natural variability in groundwater unrelated to practices at the site.

Statistically significant increasing trends were found for several constituents in both upgradient and downgradient wells. A statistically significant increasing trend was noted for calcium in well MW-1607S; however, with the exception of the most recent sample, historical concentrations are similar and, in some cases, lower than those reported in upgradient wells. Further research beyond the scope of this analysis would be required to identify the cause for any changing groundwater concentrations in downgradient wells

(i.e. result of practices at the site, natural variation, or an off-site source). A Trend Test summary table follows this letter.

Evaluation of Appendix IV Parameters

Parametric tolerance limits were used to calculate background limits from pooled upgradient well data for Appendix IV parameters with a target of 95% confidence and 95% coverage to determine the Alternate Contaminant Level (ACL). The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These limits were compared to the Maximum Contaminant Levels (MCLs) and Regional Screening Levels (RSLs) in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons.

Confidence intervals were then constructed on downgradient wells for each of the Appendix IV parameters using the highest limit of either the MCL, RSL, or ACL as discussed above. Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No confidence interval exceedances were found except for lithium in wells MW-1605D, MW1605S, MW-1606D, MW-1606S, MW-1607D and MW-1607S. A summary of the confidence interval results follows this letter.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Mountaineer BAP. If you have any questions or comments, please feel free to contact me.

For Groundwater Stats Consulting,



Kristina L. Rayner
Groundwater Statistician

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to Groundwater Stats Consulting.

The following constituents were evaluated: Appendix III parameters – boron, calcium, chloride, fluoride, pH, sulfate, and TDS; and Appendix IV parameters - antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 & 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

Time series plots for Appendix III and IV parameters at all wells are provided for the purpose of screening data at these wells (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells.

Data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves are provided to demonstrate that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Method:

- 1) Intrawell prediction limits, combined with a 1-of-2 resample plan for pH; and
- 2) Interwell prediction limits combined with a 1-of-2 resample plan for boron, calcium, chloride, fluoride, sulfate, and TDS.

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are nondetects, a nonparametric test is utilized. 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 prediction limits.

- No statistical analyses are required on wells and analytes containing 100% nondetects (USEPA Unified Guidance, 2009, Chapter 6).

- When data contain <15% nondetects in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for nondetects is the practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% nondetects, the Kaplan-Meier nondetect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric prediction limits are used on data containing greater than 50% nondetects.

Background Screening

Outlier Evaluation

Time series plots are used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix III and Appendix IV parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits (Figure C).

Tukey's outlier test noted a few outliers as may be seen on the Outlier Summary Table and accompanying graphs. Any values flagged as outliers are plotted in a lighter font on the time series graph. The test identified two outliers for chloride and one low outlier for pH in well MW-1607D; however, these values were not flagged due to all concentrations being consistent over time and similar to concentrations in neighboring wells. The high value identified as an outlier for pH at well MW-1607D was, however, flagged in the database. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

No true seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends (Figure D). In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a handful of statistically significant trends as may be seen on the Trend Test Summary table that accompanies the trend tests. All trends were relatively low in magnitude when compared to average concentrations. One exception is chloride in upgradient well MW-1601A which shows a statistically significant increasing trend over time. However, concentrations in this well are similar to neighboring upgradient well concentrations and, therefore, required no adjustment at this time. This well will continue to be monitored and re-evaluated as more data are collected.

Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) was used to statistically evaluate differences in average concentrations among upgradient wells, which assists in identifying the most appropriate statistical approach (Figure E). Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

The ANOVA identified variation for all Appendix III parameters; therefore, these data were further evaluated as described for the appropriateness of intrawell testing to accommodate the groundwater quality. A summary table of the ANOVA results is included with the reports.

Appendix III - Statistical Limits

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that are conservative (i.e. lower) from a regulatory perspective, and that will rapidly identify a change in more recent compliance data from within a given well. This statistical method removes the element of variation from across wells and eliminates the chance of mistaking natural spatial variation for a release from the facility. Prior to performing intrawell prediction limits, several steps are required to reasonably demonstrate downgradient water quality does not have existing impacts from the practices of the facility.

Exploratory data analysis was used as a general comparison of concentrations in downgradient wells for all Appendix III parameters recommended for intrawell analyses to concentrations reported in upgradient wells. Upper tolerance limits are used in conjunction with confidence intervals to determine whether the estimated averages in downgradient wells are higher than observed levels upgradient of the facility. The upper tolerance limits were constructed to represent the extreme upper range of possible background levels at the site.

In cases where downgradient average concentrations are higher than observed concentrations upgradient for a given constituent, an independent study and hydrogeological investigation would be required to identify local geochemical conditions and expected groundwater quality for the region to justify an intrawell approach. Such an assessment is beyond the scope of services provided by Groundwater Stats Consulting. When there is not an obvious explanation for observed concentration differences in downgradient wells relative to reported concentrations in upgradient wells, interwell prediction limits will initially be selected for the statistical method until further evidence shows that concentrations are due to natural variation rather than a result of the facility.

Parametric tolerance limits were constructed with a target of 99% confidence and 95% coverage using pooled upgradient well data for each of the Appendix III parameters (Figure F). The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. As more data are collected, the background population is better represented and the confidence and coverage levels increase.

Confidence intervals were constructed on downgradient wells for each of the Appendix III parameters, using the tolerance limits discussed above, to determine intrawell eligibility (Figure G). When the entire confidence interval is above a background

standard for a given parameter, interwell methods are initially recommended as the statistical method. Therefore, only parameters with confidence intervals which did not exceed background standards are eligible for intrawell prediction limits.

Confidence intervals for the above parameters were found to be within their respective background limit for pH; while confidence intervals were above their respective background limits in at least one well for all other Appendix III parameters. Therefore, intrawell methods are recommended for pH, and interwell methods are initially recommended for boron, calcium, chloride, fluoride, sulfate and TDS. As mentioned earlier, if a demonstration supports natural variation in groundwater, intrawell methods will be considered for all parameters.

All available data through June 2017 at each well were used to establish intrawell background limits based on a 1-of-2 resample plan that will be used for future comparisons (Figure H). Interwell prediction limits, combined with a 1-of-2 resample plan, were constructed from upgradient wells (Figure I). Downgradient measurements will be compared to these background limits during each subsequent semi-annual sampling event.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits will be necessary to accommodate these types of changes. In the interwell case, newer data will be included in background when a minimum of 2 new samples are available. In the intrawell case, data for all wells and constituents are re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In some cases, the earlier portion of data are deselected prior to construction of limits in order to provide sensitive limits that will rapidly detect changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of an additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified and further research would be required to identify the cause of the exceedance (i.e. impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is

considered to be a false positive result and, therefore, no further action is necessary. A summary table of the background prediction limits follows this letter.

Appendix IV – Assessment Monitoring Program

During an Assessment Monitoring program confidence intervals are constructed at all wells for detected Appendix IV parameters. A minimum of 4 samples is required to construct confidence intervals; however, 8 samples are generally recommended for better representation of the true average population. Established Maximum Contaminant Levels (MCLs) are used as the GWPS comparisons, unless background limits are higher as discussed below. Parametric confidence intervals are constructed with 99% confidence when data follow a normal or transformed-normal distribution. For all other cases, nonparametric confidence intervals are constructed, with the confidence level based on the number of samples available. The GWPS is exceeded only when the entire confidence interval exceeds its respective GWPS.

Background limits are established for the Appendix IV parameters using upper tolerance limits constructed with 95% confidence/95% coverage using pooled upgradient well data, for comparison against established MCLs. When background limits, or Alternate Contaminant Levels (ACLs), are higher than established MCLs, the CCR Rule recommends using these ACLs as the GWPS for the confidence interval comparisons. Additionally, tolerance limits are also recommended to establish ACLs for Appendix IV parameters, cobalt, lithium, and molybdenum, which do not have established MCLs. Since the scope of this project included screening and development of background limits for Appendix III Detection Monitoring statistics, comparison of the Appendix IV parameters with confidence intervals was not included in this report.

Recommendations

In summary, as a result of the background screening described in this letter, intrawell prediction limits combined with a 1-of-2 resample plan are recommended for pH; and interwell prediction limits combined with a 1-of-2 resample plan are recommended for boron, calcium, chloride, fluoride, sulfate, and TDS. The statistical analyses will be constructed according to the USEPA Unified Guidance, based on seven Appendix III parameters and eight downgradient wells.

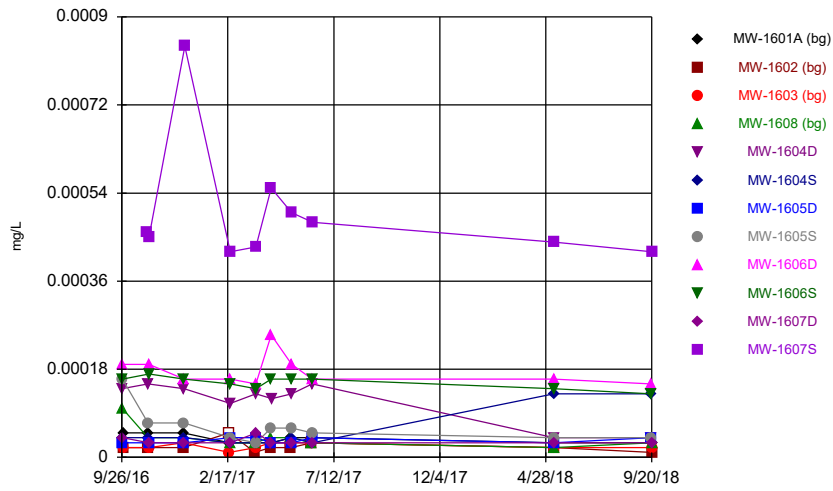
Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Mountaineer Bottom Ash Pond. If you have any questions or comments, please feel free to contact me.

For Groundwater Stats Consulting,

A handwritten signature in black ink, appearing to read "Kristina L. Rayner". The signature is written in a cursive, flowing style.

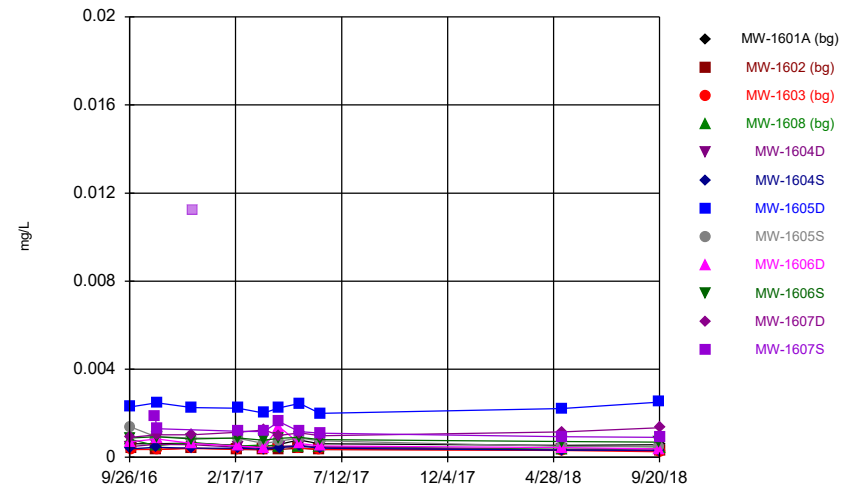
Kristina L. Rayner
Groundwater Statistician

Time Series



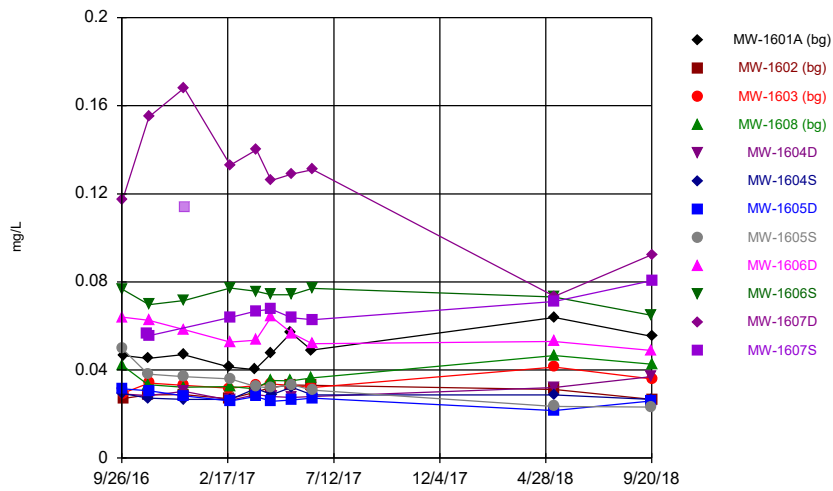
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



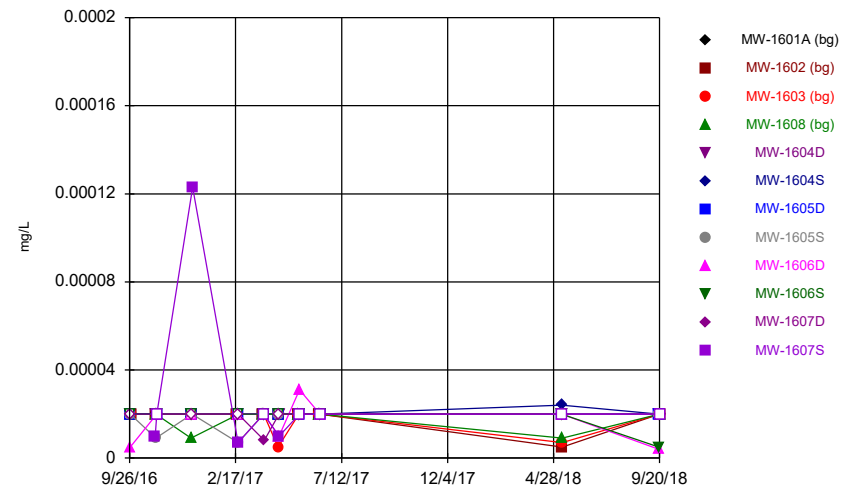
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



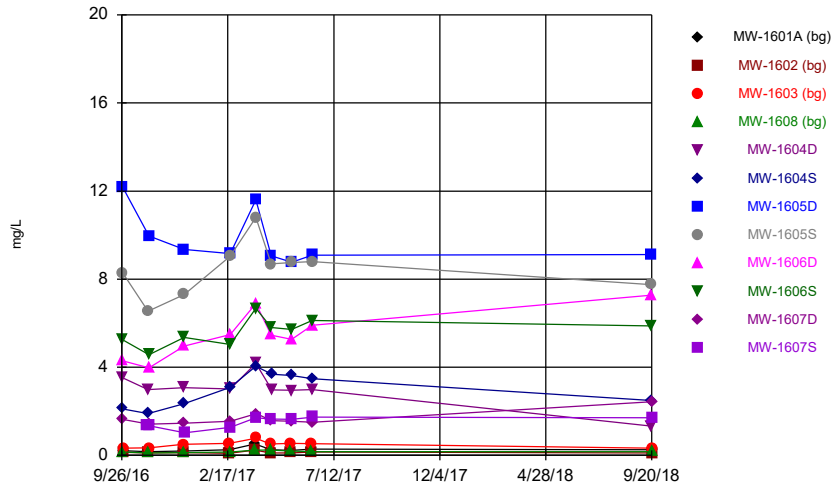
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Time Series



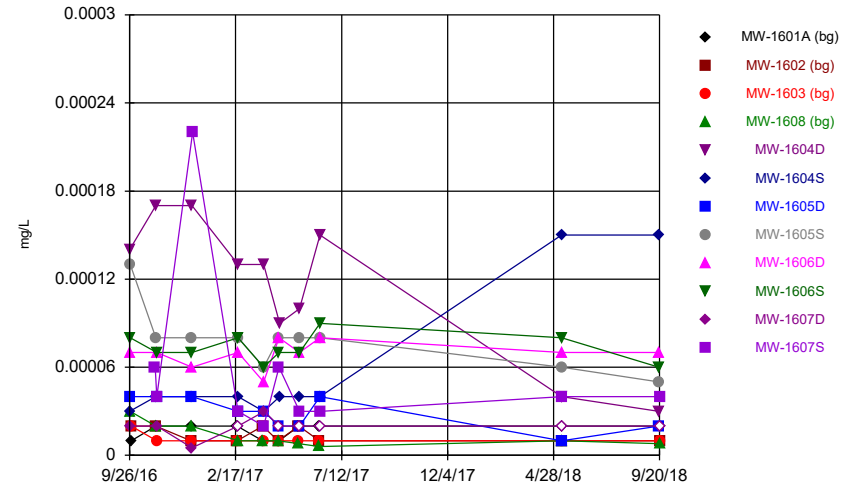
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Time Series



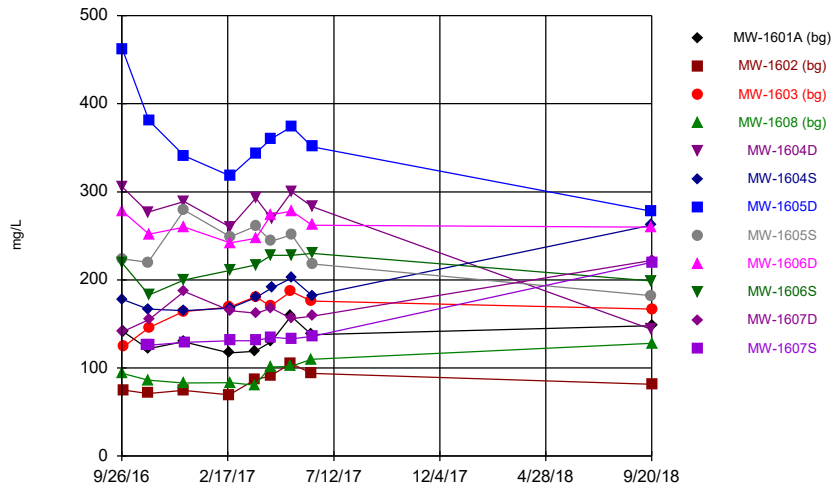
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Time Series



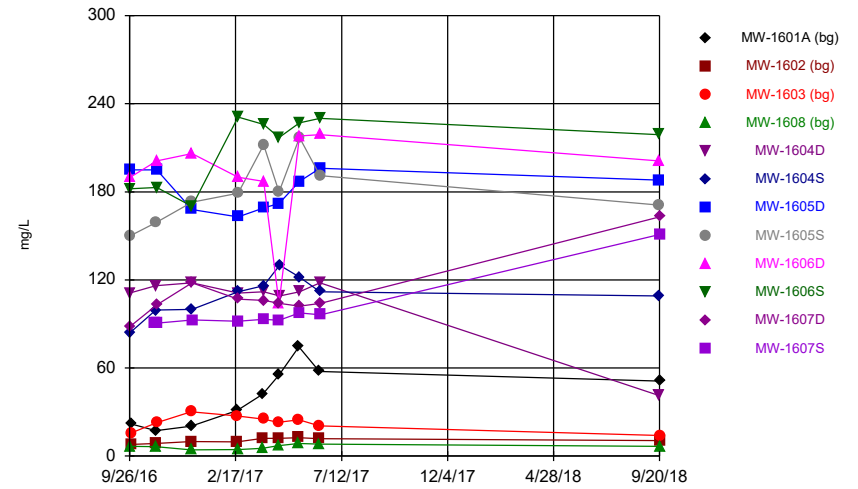
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Time Series



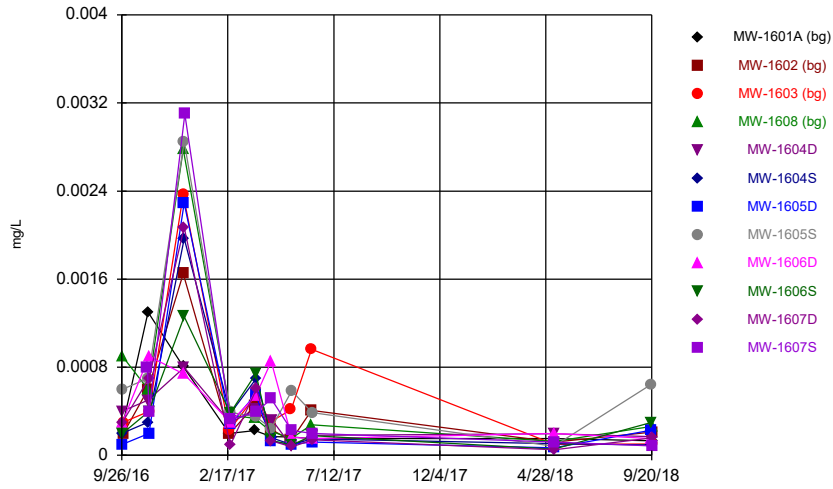
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Time Series



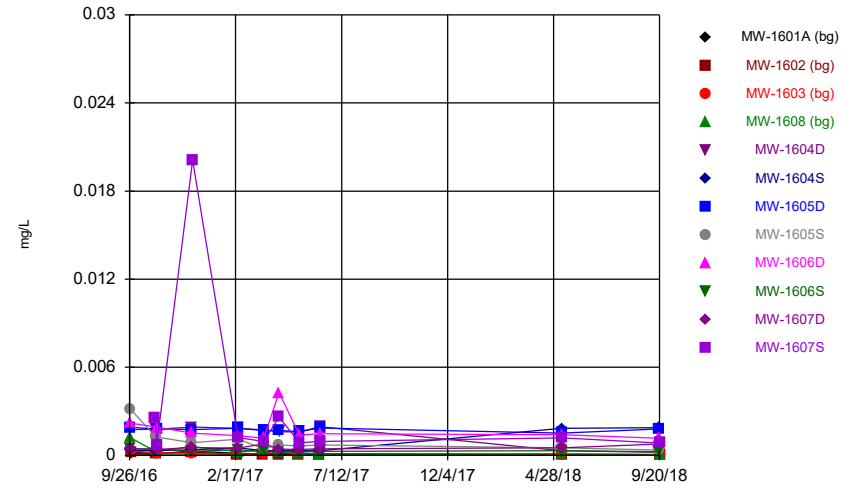
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Time Series



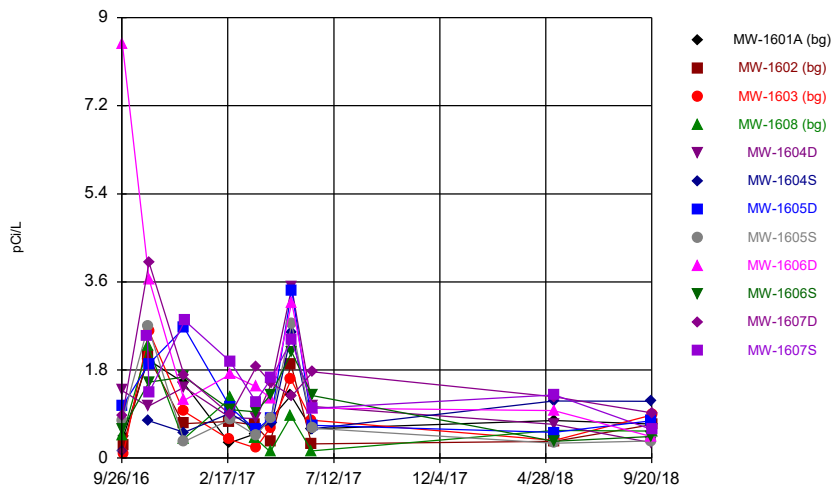
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Time Series



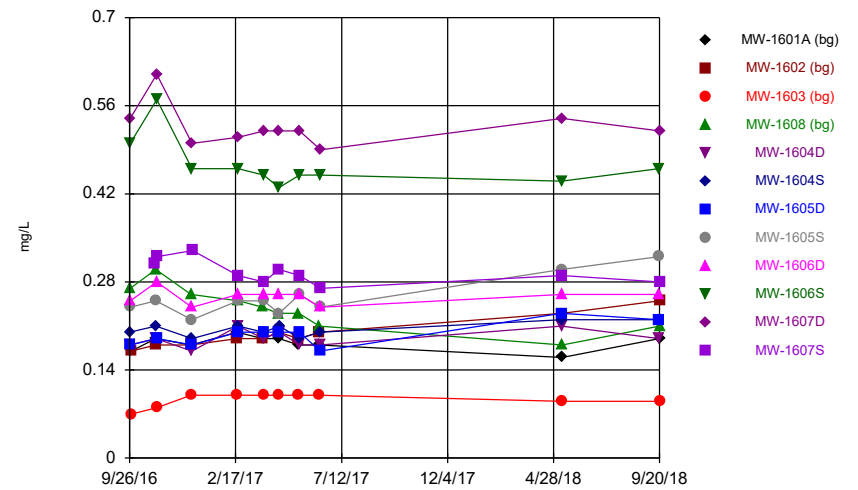
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Time Series



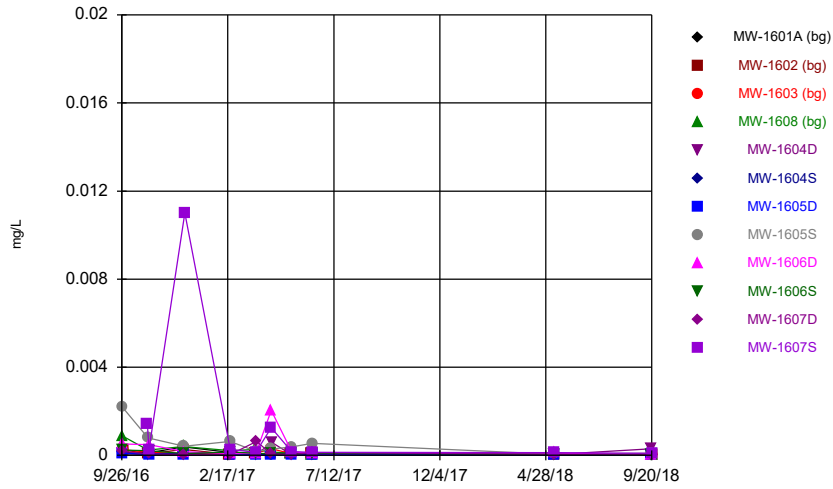
Constituent: Combined Radium 226 + 228 Analysis Run 12/3/2018 8:23 AM View: Descriptive
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



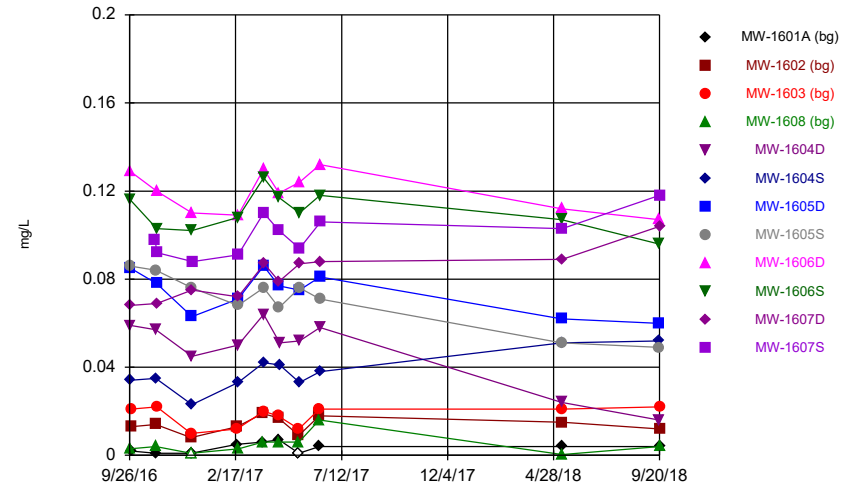
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Time Series



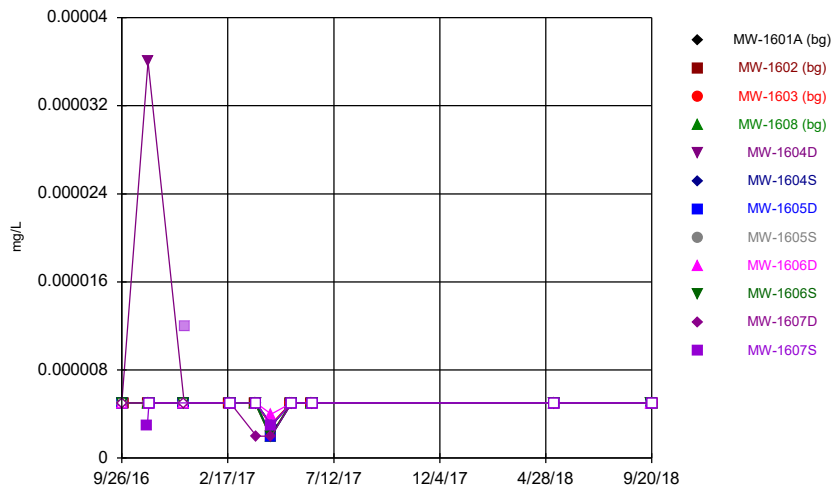
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



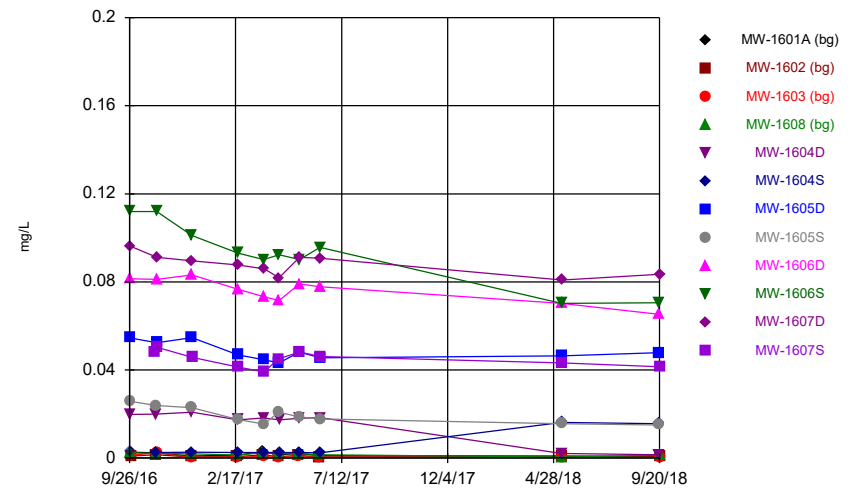
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Time Series



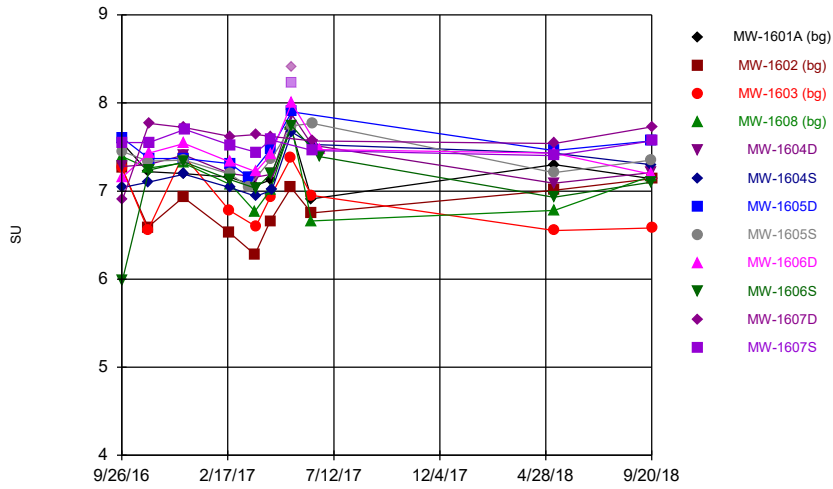
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Time Series



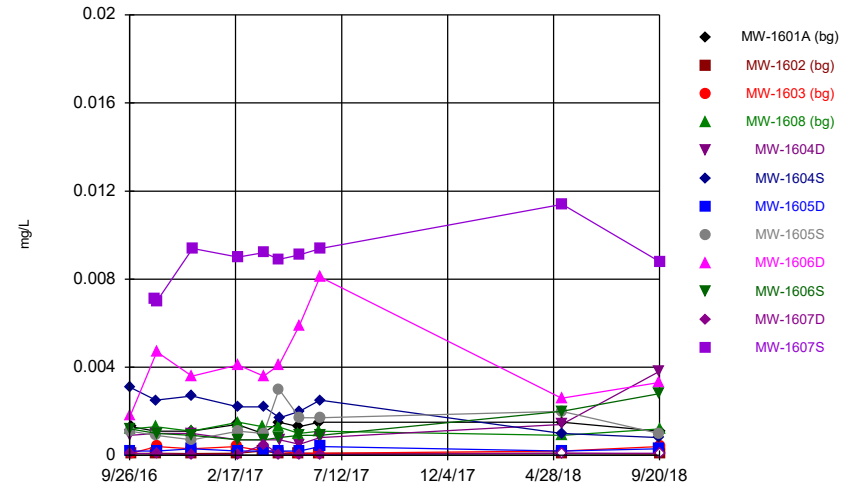
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Time Series



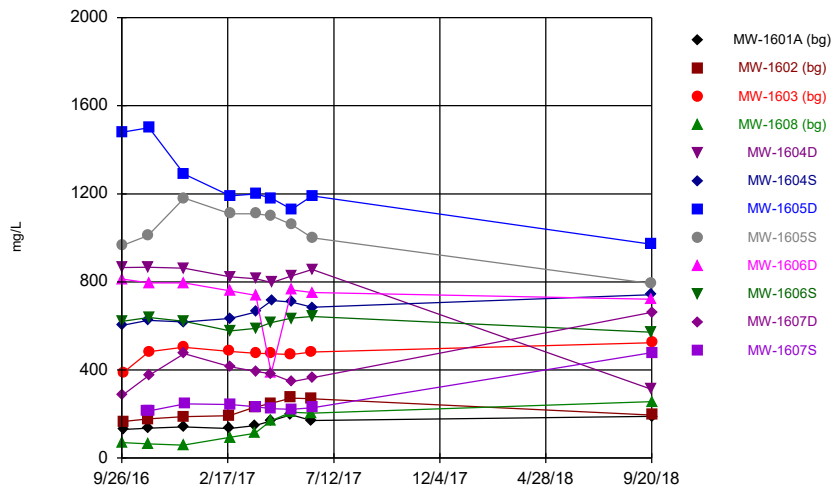
Constituent: pH, field Analysis Run 12/3/2018 8:23 AM View: Descriptive
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Time Series



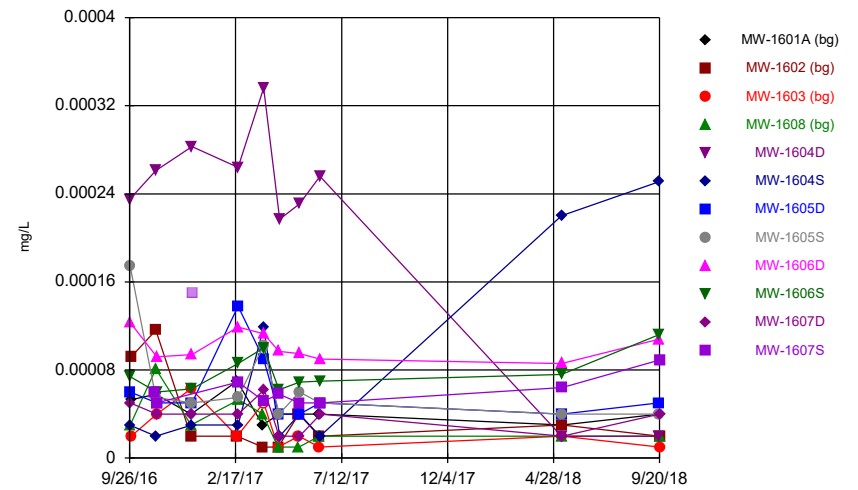
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Time Series



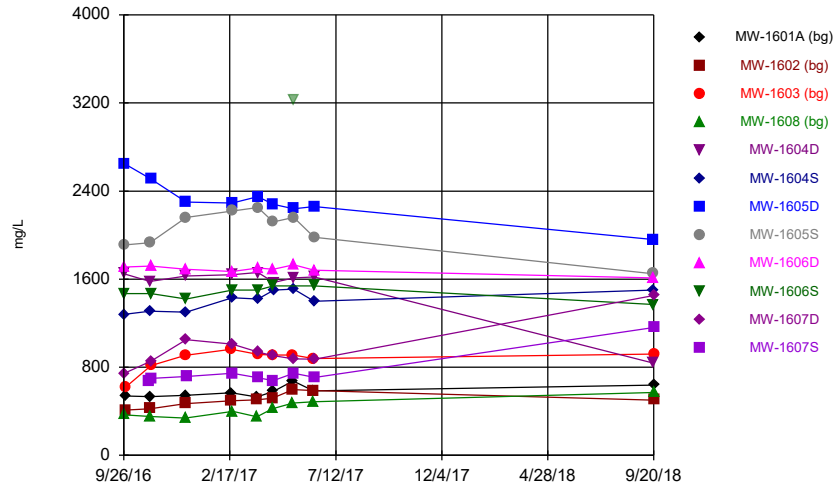
Constituent: Sulfate, total Analysis Run 12/3/2018 8:24 AM View: Descriptive
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Thallium, total Analysis Run 12/3/2018 8:24 AM View: Descriptive
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:24 AM View: Descriptive
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Interwell Prediction Limit Summary Table - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:38 AM

Constituent	Well	Upper Lim.	Lower Lim	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Boron, total (mg/L)	MW-1604D	0.6495	n/a	9/19/2018	1.33	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1604S	0.6495	n/a	9/19/2018	2.49	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1605D	0.6495	n/a	9/19/2018	9.11	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1605S	0.6495	n/a	9/19/2018	7.75	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1606D	0.6495	n/a	9/19/2018	7.27	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1606S	0.6495	n/a	9/19/2018	5.87	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1607D	0.6495	n/a	9/20/2018	2.44	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1607S	0.6495	n/a	9/20/2018	1.71	Yes 36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1604S	192.1	n/a	9/19/2018	262	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1605D	192.1	n/a	9/19/2018	278	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1606D	192.1	n/a	9/19/2018	260	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1606S	192.1	n/a	9/19/2018	199	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1607D	192.1	n/a	9/20/2018	222	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1607S	192.1	n/a	9/20/2018	220	Yes 36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1604S	59.92	n/a	9/19/2018	109	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1605D	59.92	n/a	9/19/2018	188	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1605S	59.92	n/a	9/19/2018	171	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1606D	59.92	n/a	9/19/2018	201	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1606S	59.92	n/a	9/19/2018	219	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1607D	59.92	n/a	9/20/2018	163	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1607S	59.92	n/a	9/20/2018	151	Yes 36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1605S	0.2944	n/a	9/19/2018	0.32	Yes 40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1606S	0.2944	n/a	9/19/2018	0.46	Yes 40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1607D	0.2944	n/a	9/20/2018	0.52	Yes 40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1604S	610.7	n/a	9/19/2018	742	Yes 36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1605D	610.7	n/a	9/19/2018	972	Yes 36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1605S	610.7	n/a	9/19/2018	793	Yes 36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1606D	610.7	n/a	9/19/2018	722	Yes 36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1607D	610.7	n/a	9/20/2018	662	Yes 36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1604S	1016	n/a	9/19/2018	1500	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1605D	1016	n/a	9/19/2018	1960	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1605S	1016	n/a	9/19/2018	1650	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1606D	1016	n/a	9/19/2018	1610	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1606S	1016	n/a	9/19/2018	1370	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1607D	1016	n/a	9/20/2018	1450	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1607S	1016	n/a	9/20/2018	1160	Yes 36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2

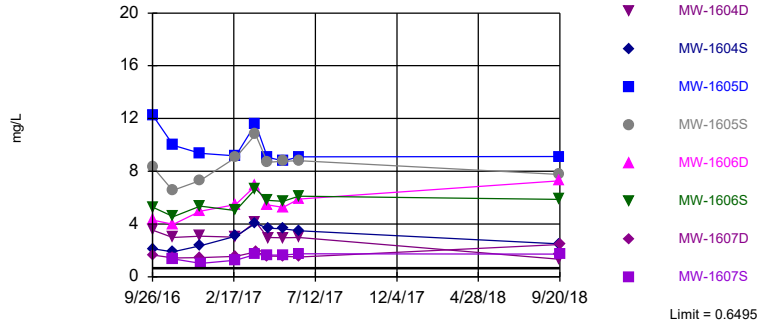
Interwell Prediction Limit Summary Table - All Results

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Constituent	Well	Upper Lim.	Lower Lim	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Boron, total (mg/L)	MW-1604D	0.6495	n/a	9/19/2018	1.33	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1604S	0.6495	n/a	9/19/2018	2.49	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1605D	0.6495	n/a	9/19/2018	9.11	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1605S	0.6495	n/a	9/19/2018	7.75	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1606D	0.6495	n/a	9/19/2018	7.27	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1606S	0.6495	n/a	9/19/2018	5.87	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1607D	0.6495	n/a	9/20/2018	2.44	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Boron, total (mg/L)	MW-1607S	0.6495	n/a	9/20/2018	1.71	Yes	36	0.6179	0.1221	0	None	x^(1/3)	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1604D	192.1	n/a	9/19/2018	144	No	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1604S	192.1	n/a	9/19/2018	262	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1605D	192.1	n/a	9/19/2018	278	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1605S	192.1	n/a	9/19/2018	182	No	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1606D	192.1	n/a	9/19/2018	260	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1606S	192.1	n/a	9/19/2018	199	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1607D	192.1	n/a	9/20/2018	222	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Calcium, total (mg/L)	MW-1607S	192.1	n/a	9/20/2018	220	Yes	36	119.6	35.73	0	None	No	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1604D	59.92	n/a	9/19/2018	41.3	No	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1604S	59.92	n/a	9/19/2018	109	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1605D	59.92	n/a	9/19/2018	188	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1605S	59.92	n/a	9/19/2018	171	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1606D	59.92	n/a	9/19/2018	201	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1606S	59.92	n/a	9/19/2018	219	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1607D	59.92	n/a	9/20/2018	163	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Chloride, total (mg/L)	MW-1607S	59.92	n/a	9/20/2018	151	Yes	36	2.553	0.6694	0	None	x^(1/3)	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1604D	0.2944	n/a	9/19/2018	0.19	No	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1604S	0.2944	n/a	9/19/2018	0.22	No	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1605D	0.2944	n/a	9/19/2018	0.22	No	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1605S	0.2944	n/a	9/19/2018	0.32	Yes	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1606D	0.2944	n/a	9/19/2018	0.26	No	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1606S	0.2944	n/a	9/19/2018	0.46	Yes	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1607D	0.2944	n/a	9/20/2018	0.52	Yes	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Fluoride, total (mg/L)	MW-1607S	0.2944	n/a	9/20/2018	0.28	No	40	0.178	0.05788	0	None	No	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1604D	610.7	n/a	9/19/2018	313	No	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1604S	610.7	n/a	9/19/2018	742	Yes	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1605D	610.7	n/a	9/19/2018	972	Yes	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1605S	610.7	n/a	9/19/2018	793	Yes	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1606D	610.7	n/a	9/19/2018	722	Yes	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1606S	610.7	n/a	9/19/2018	571	No	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1607D	610.7	n/a	9/20/2018	662	Yes	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Sulfate, total (mg/L)	MW-1607S	610.7	n/a	9/20/2018	478	No	36	6.043	1.202	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1604D	1016	n/a	9/19/2018	838	No	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1604S	1016	n/a	9/19/2018	1500	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1605D	1016	n/a	9/19/2018	1960	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1605S	1016	n/a	9/19/2018	1650	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1606D	1016	n/a	9/19/2018	1610	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1606S	1016	n/a	9/19/2018	1370	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1607D	1016	n/a	9/20/2018	1450	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-1607S	1016	n/a	9/20/2018	1160	Yes	36	8.31	0.8575	0	None	x^(1/3)	0.0009403	Param 1 of 2

Exceeds Limit: MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1

Prediction Limit
Interwell Parametric

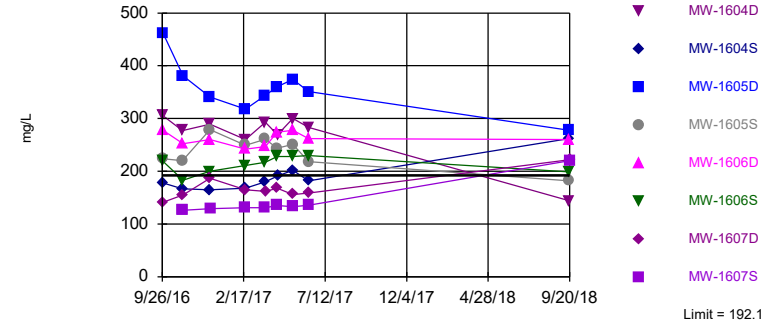


Background Data Summary (based on cube root transformation): Mean=0.6179, Std. Dev.=0.1221, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9135, critical = 0.912. Kappa = 2.031 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Boron, total Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Exceeds Limit: MW-1604S, MW-1605D, MW-1606D, MW-1606S, MW-1607D, MW-1

Prediction Limit
Interwell Parametric

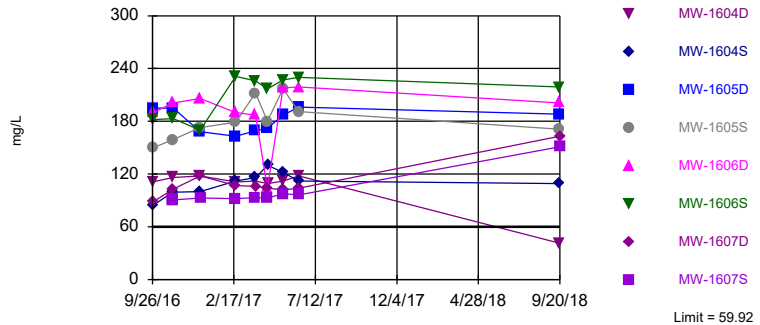


Background Data Summary: Mean=119.6, Std. Dev.=35.73, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9272, critical = 0.912. Kappa = 2.031 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Calcium, total Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Exceeds Limit: MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1

Prediction Limit
Interwell Parametric

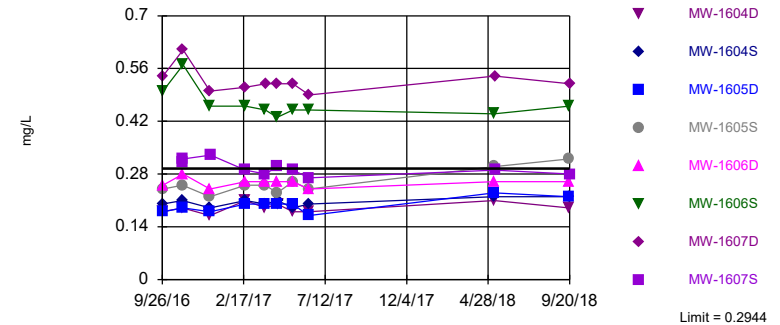


Background Data Summary (based on cube root transformation): Mean=2.553, Std. Dev.=0.6694, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9317, critical = 0.912. Kappa = 2.031 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Chloride, total Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Exceeds Limit: MW-1605S, MW-1606S, MW-1607D

Prediction Limit
Interwell Parametric

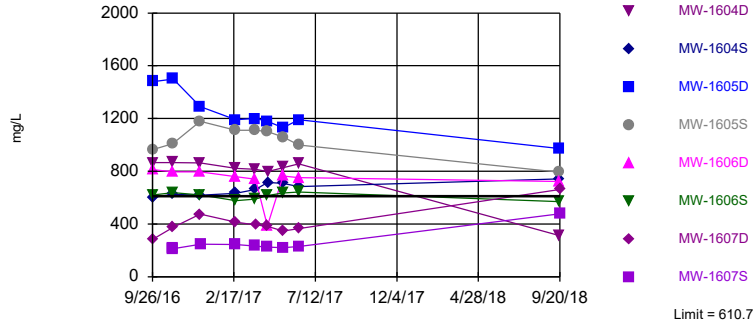


Background Data Summary: Mean=0.178, Std. Dev.=0.05788, n=40. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9253, critical = 0.919. Kappa = 2.012 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Fluoride, total Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Exceeds Limit: MW-1604S, MW-1605D,
MW-1605S, MW-1606D, MW-1607D

Prediction Limit
Interwell Parametric

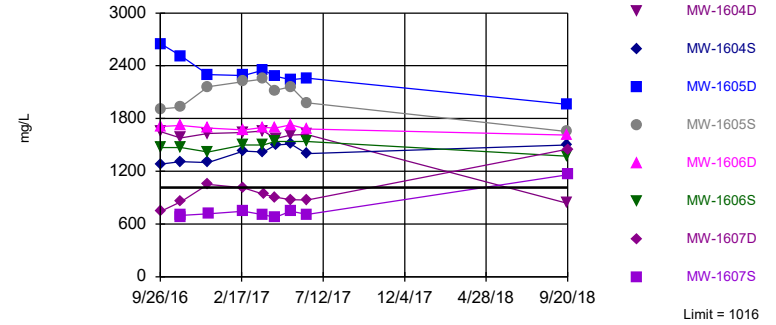


Background Data Summary (based on cube root transformation): Mean=6.043, Std. Dev.=1.202, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9171, critical = 0.912. Kappa = 2.031 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Sulfate, total Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Exceeds Limit: MW-1604S, MW-1605D,
MW-1605S, MW-1606D, MW-1606S, MW-1

Prediction Limit
Interwell Parametric



Background Data Summary (based on cube root transformation): Mean=8.31, Std. Dev.=0.8575, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9144, critical = 0.912. Kappa = 2.031 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 6:35 AM View: PL's - Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

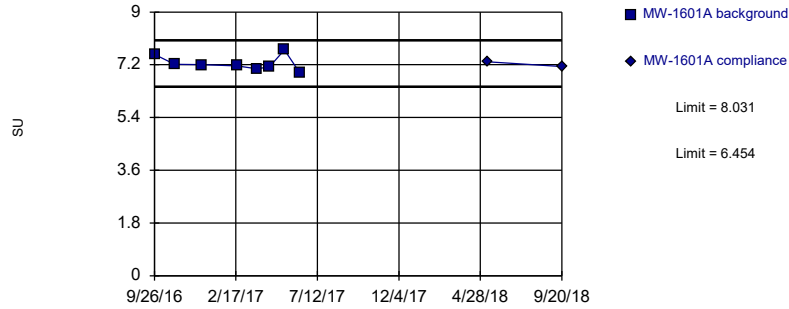
Intrawell Prediction Limit Summary Table - All Results (No Significant Results)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:44 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
pH, field (SU)	MW-1601A	8.031	6.454	9/20/2018	7.14	No 8	7.243	0.2615	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1602	7.694	5.816	9/20/2018	7.14	No 8	6.755	0.3115	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1603	7.999	5.971	9/20/2018	6.58	No 8	6.985	0.3366	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1608	8.216	6.092	9/19/2018	7.17	No 8	7.154	0.3523	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1604D	8.08	6.653	9/19/2018	7.21	No 8	7.366	0.2368	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1604S	7.991	6.389	9/19/2018	7.3	No 8	7.19	0.2657	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1605D	8.258	6.653	9/19/2018	7.57	No 7	7.456	0.2388	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1605S	8.152	6.66	9/19/2018	7.35	No 8	7.406	0.2476	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1606D	8.222	6.671	9/19/2018	7.19	No 8	7.446	0.2573	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1606S	8.662	5.6	9/19/2018	7.1	No 8	7.131	0.508	0	None	No	0.0004701	Param 1 of 2
pH, field (SU)	MW-1607D	7.77	6.9	9/20/2018	7.73	No 7	n/a	n/a	0	n/a	n/a	0.05531	NP (normality) 1 of 2
pH, field (SU)	MW-1607S	7.831	7.255	9/20/2018	7.57	No 7	7.543	0.08577	0	None	No	0.0004701	Param 1 of 2

Within Limits

Prediction Limit Intrawell Parametric

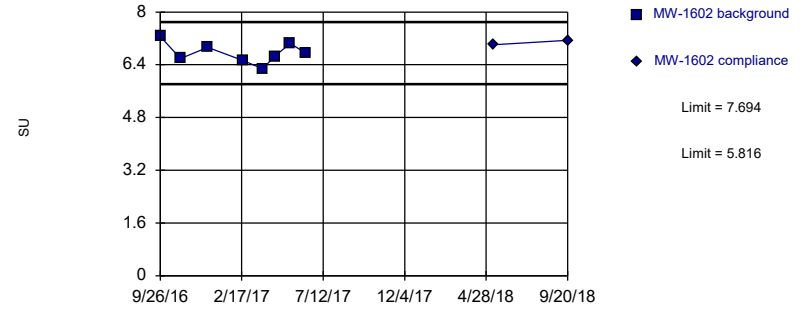


Background Data Summary: Mean=7.243, Std. Dev.=0.2615, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.902, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit Intrawell Parametric

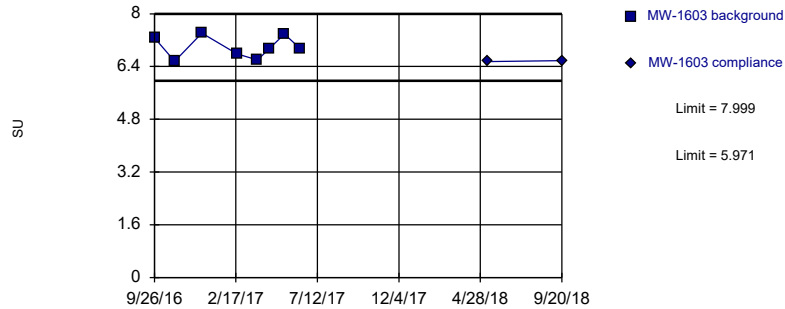


Background Data Summary: Mean=6.755, Std. Dev.=0.3115, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9867, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit Intrawell Parametric

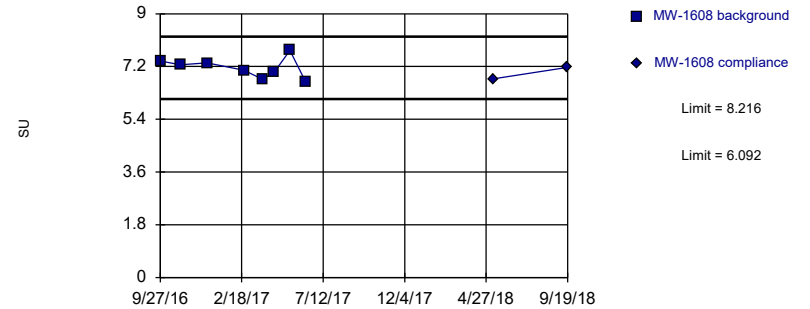


Background Data Summary: Mean=6.985, Std. Dev.=0.3366, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9063, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit Intrawell Parametric

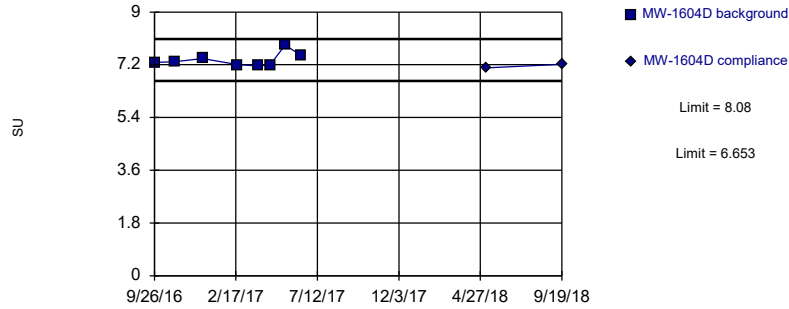


Background Data Summary: Mean=7.154, Std. Dev.=0.3523, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9751, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

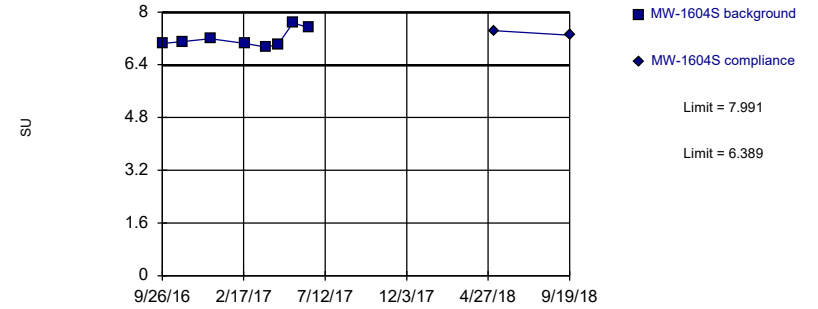


Background Data Summary: Mean=7.366, Std. Dev.=0.2368, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8333, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

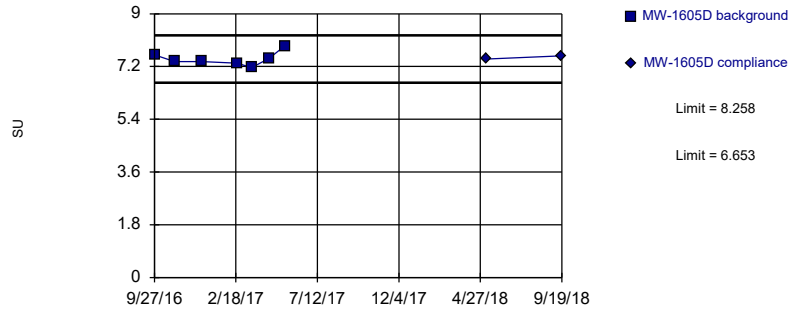


Background Data Summary: Mean=7.19, Std. Dev.=0.2657, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8184, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

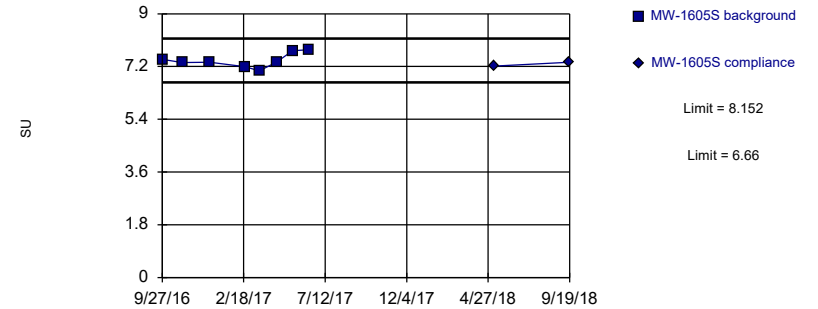


Background Data Summary: Mean=7.456, Std. Dev.=0.2388, n=7. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9315, critical = 0.73. Kappa = 3.361 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

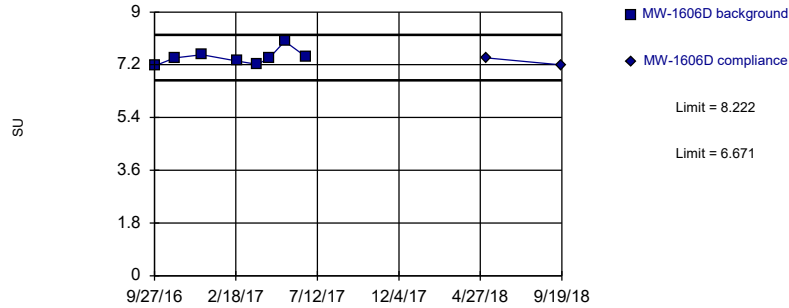


Background Data Summary: Mean=7.406, Std. Dev.=0.2476, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9237, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

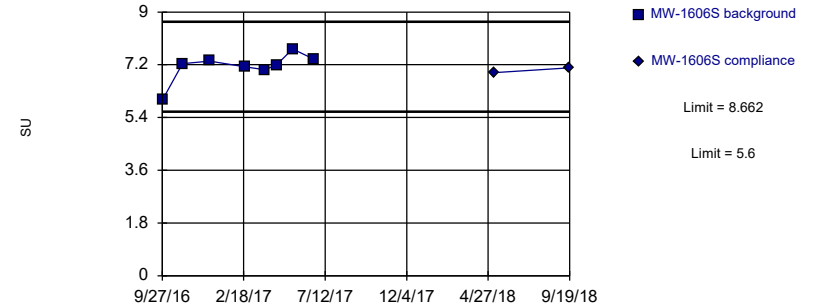


Background Data Summary: Mean=7.446, Std. Dev.=0.2573, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8686, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric

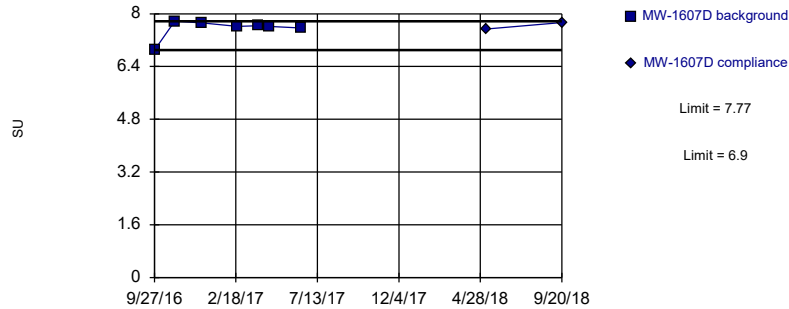


Background Data Summary: Mean=7.131, Std. Dev.=0.508, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8107, critical = 0.749. Kappa = 3.014 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Non-parametric

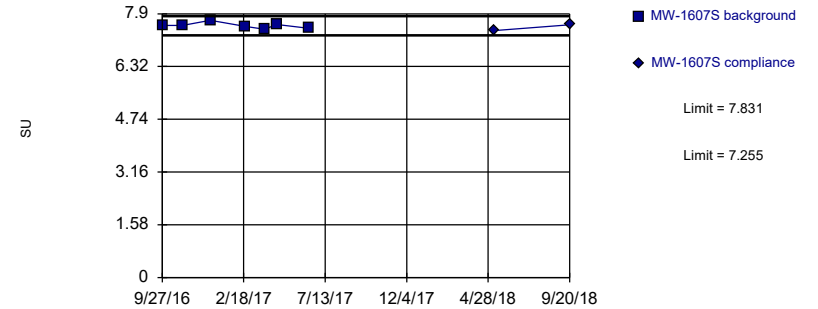


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 7 background values. Well-constituent pair annual alpha = 0.1091. Individual comparison alpha = 0.05531 (1 of 2).

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Within Limits

Prediction Limit
Intrawell Parametric



Background Data Summary: Mean=7.543, Std. Dev.=0.08577, n=7. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9302, critical = 0.73. Kappa = 3.361 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: pH, field Analysis Run 12/3/2018 6:40 AM View: PL's - Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Trend Test Summary Table - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 8:36 AM

<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>
Calcium, total (mg/L)	MW-1607S	16.37	32	25	Yes	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1607S	12.46	26	25	Yes	9	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1602 (bg)	0.03724	38	30	Yes	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1608 (bg)	-0.06348	-39	-30	Yes	10	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1601A (bg)	52.31	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1602 (bg)	140.9	26	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1608 (bg)	191.7	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1604S	100.2	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1605D	-336.3	-27	-25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1602 (bg)	203.2	26	25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1605D	-320.7	-30	-25	Yes	9	0	n/a	n/a	0.01	NP

Trend Test Summary Table - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 8:36 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	MW-1601A (bg)	0.07813	14	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1602 (bg)	-0.003813	-3	-25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1603 (bg)	0.09386	8	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1608 (bg)	0.03387	13	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1604D	-0.3259	-19	-25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1604S	2.133	12	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1605D	-1.432	-20	-25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1605S	0.7029	8	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1606D	1.645	22	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1606S	0.9538	18	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1607D	0.2427	9	25	No	9	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1607S	0.5123	18	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1601A (bg)	15.24	11	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1602 (bg)	28.4	16	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1603 (bg)	47.47	20	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1608 (bg)	22.55	18	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1604S	45.11	24	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1605D	-51.95	-12	-25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1606D	2.086	2	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1606S	43.85	13	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1607D	24.49	12	25	No	9	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1607S	16.37	32	25	Yes	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1601A (bg)	60.97	24	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1602 (bg)	5.271	20	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1603 (bg)	-5.669	-10	-25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1608 (bg)	1.415	14	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1604S	41.14	17	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1605D	2.681	7	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1605S	48.88	18	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1606D	8.223	6	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1606S	33.57	14	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1607D	10.3	7	25	No	9	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1607S	12.46	26	25	Yes	9	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1601A (bg)	0	-4	-30	No	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1602 (bg)	0.03724	38	30	Yes	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1603 (bg)	0	5	30	No	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1608 (bg)	-0.06348	-39	-30	Yes	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1605S	0.04044	21	30	No	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1606S	-0.02483	-21	-30	No	10	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1607D	0	-4	-30	No	10	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1601A (bg)	52.31	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1602 (bg)	140.9	26	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1603 (bg)	16.59	4	25	No	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1608 (bg)	191.7	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1604S	100.2	28	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1605D	-336.3	-27	-25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1605S	-168.5	-11	-25	No	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1606D	-75.65	-23	-25	No	9	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1607D	70.09	4	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1601A (bg)	74.12	22	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1602 (bg)	203.2	26	25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1603 (bg)	20.19	13	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1608 (bg)	149	24	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1604S	188.5	21	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1605D	-320.7	-30	-25	Yes	9	0	n/a	n/a	0.01	NP

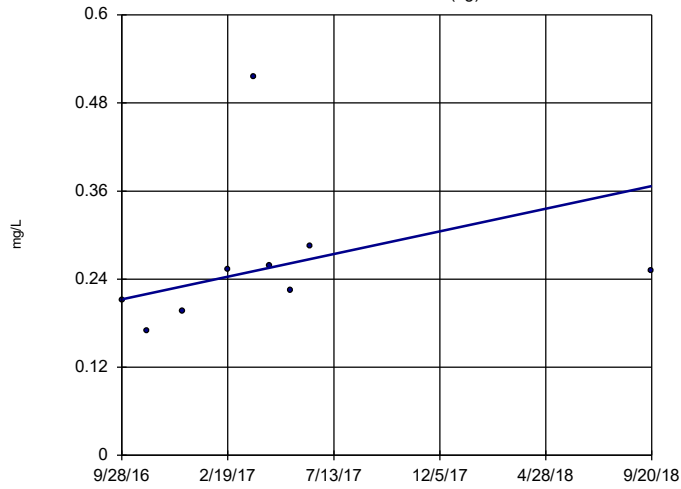
Trend Test Summary Table - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 8:36 AM

<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>
Total Dissolved Solids [TDS] (mg/L)	MW-1605S	-61.34	-1	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1606D	-47.88	-13	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1606S	74.74	7	21	No	8	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1607D	142.3	6	25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1607S	112	17	25	No	9	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1601A (bg)

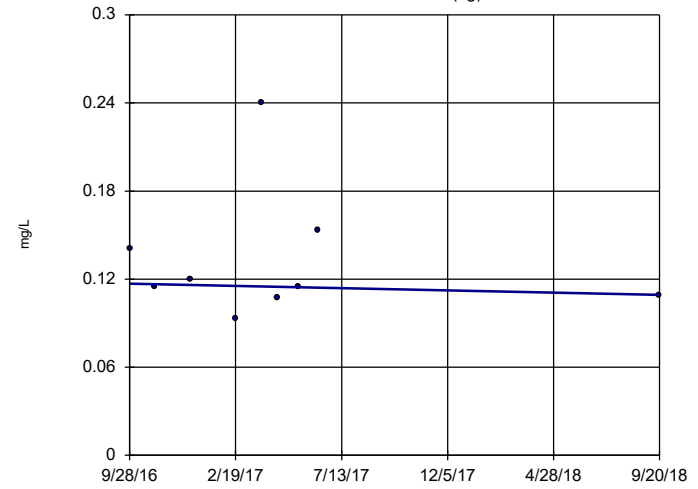


n = 9
 Slope = 0.07813 units per year.
 Mann-Kendall statistic = 14
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

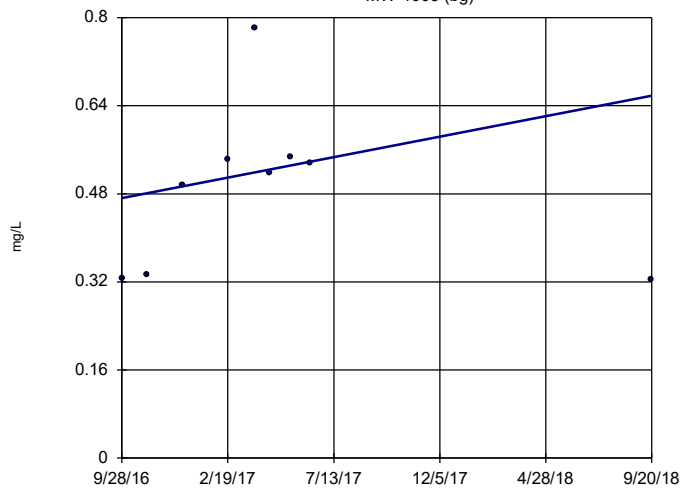


n = 9
 Slope = -0.003813 units per year.
 Mann-Kendall statistic = -3
 critical = -25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

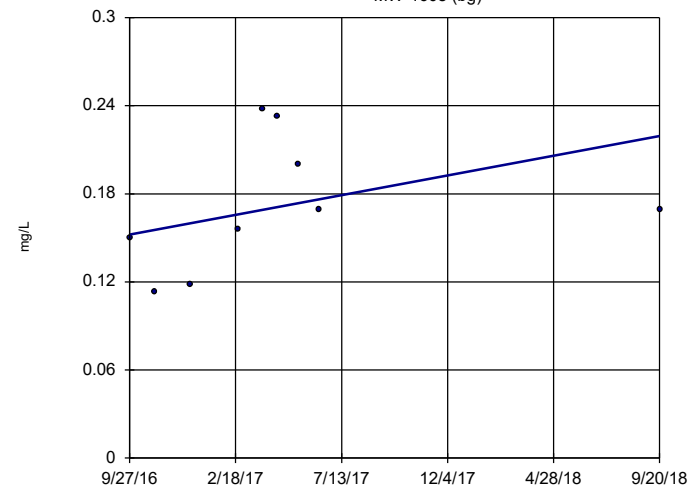


n = 9
 Slope = 0.09386 units per year.
 Mann-Kendall statistic = 8
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

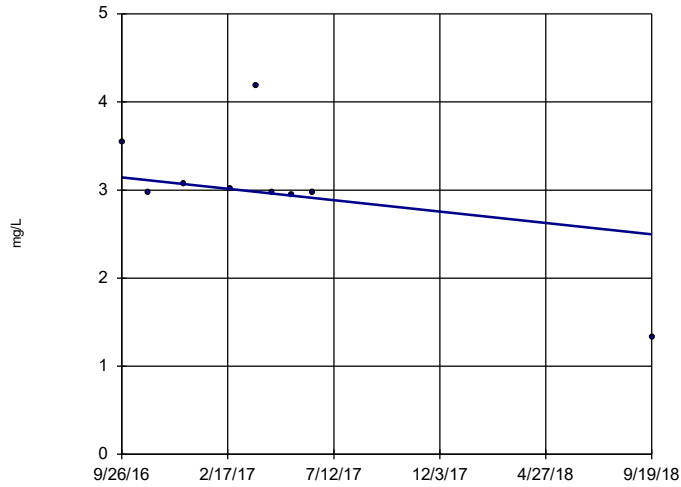


n = 9
 Slope = 0.03387 units per year.
 Mann-Kendall statistic = 13
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1604D

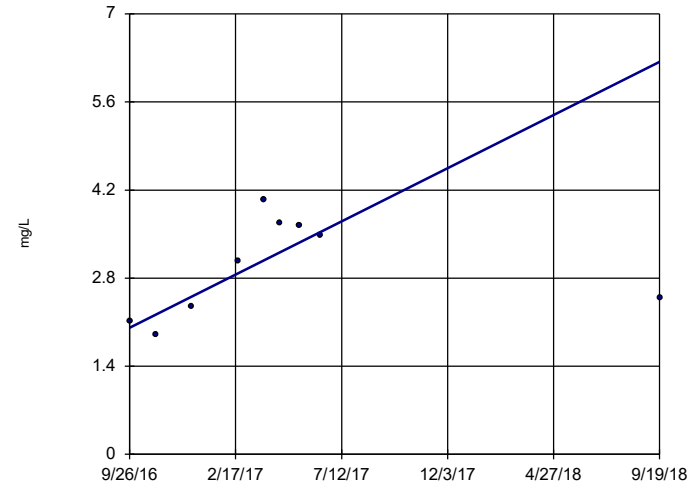


n = 9
 Slope = -0.3259
 units per year.
 Mann-Kendall
 statistic = -19
 critical = -25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1604S

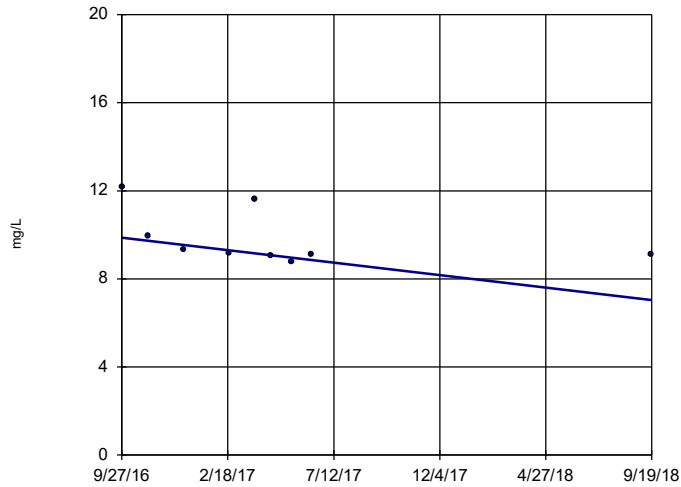


n = 9
 Slope = 2.133
 units per year.
 Mann-Kendall
 statistic = 12
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605D

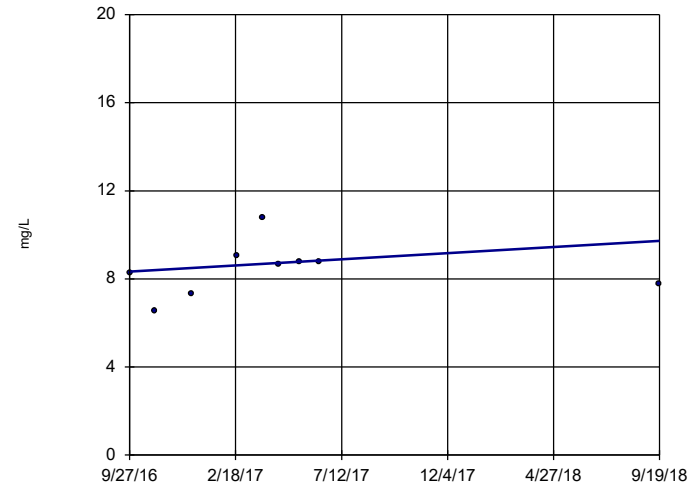


n = 9
 Slope = -1.432
 units per year.
 Mann-Kendall
 statistic = -20
 critical = -25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605S

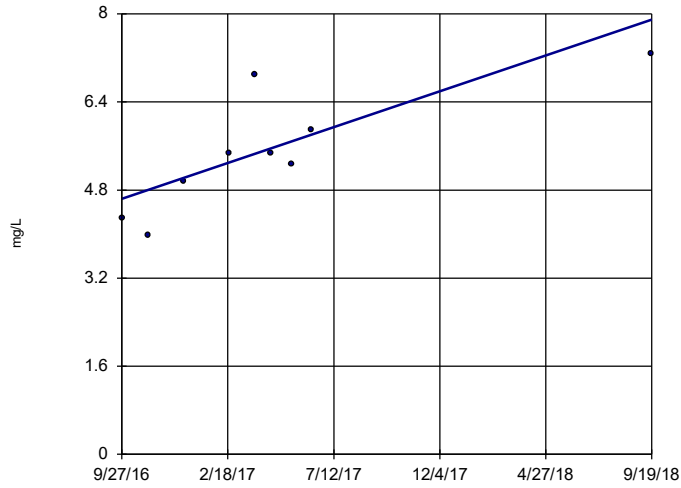


n = 9
 Slope = 0.7029
 units per year.
 Mann-Kendall
 statistic = 8
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1606D

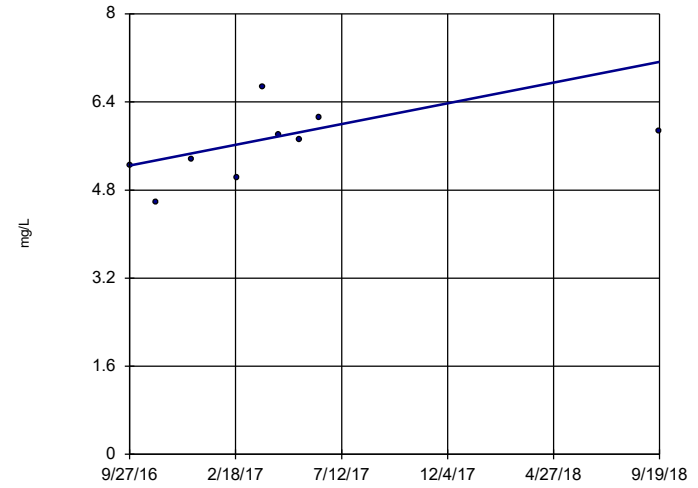


n = 9
 Slope = 1.645 units per year.
 Mann-Kendall statistic = 22
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1606S

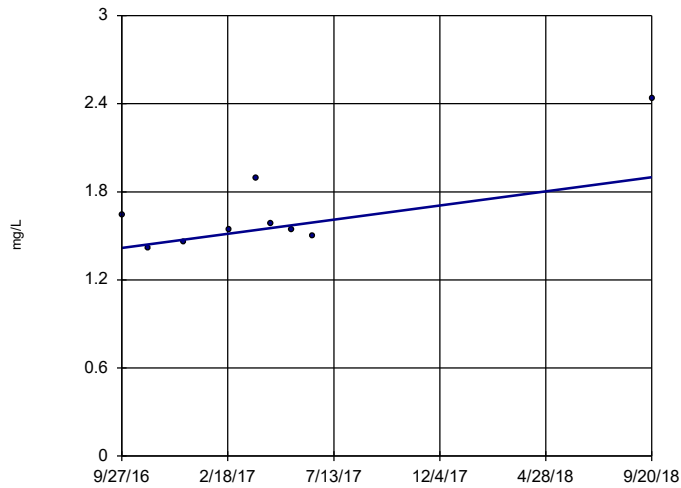


n = 9
 Slope = 0.9538 units per year.
 Mann-Kendall statistic = 18
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1607D

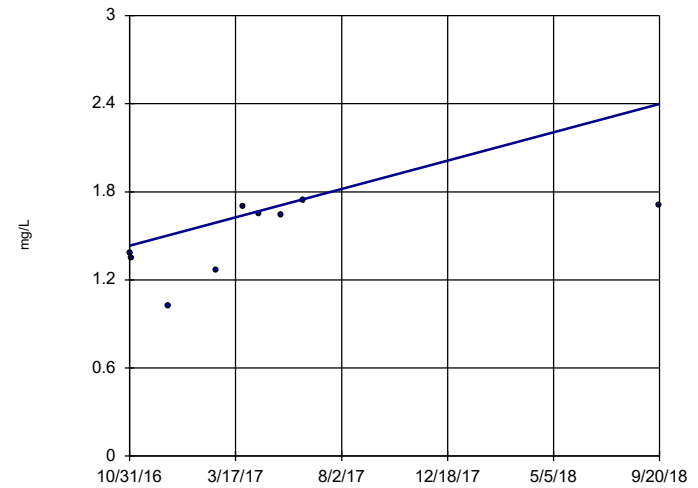


n = 9
 Slope = 0.2427 units per year.
 Mann-Kendall statistic = 9
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1607S

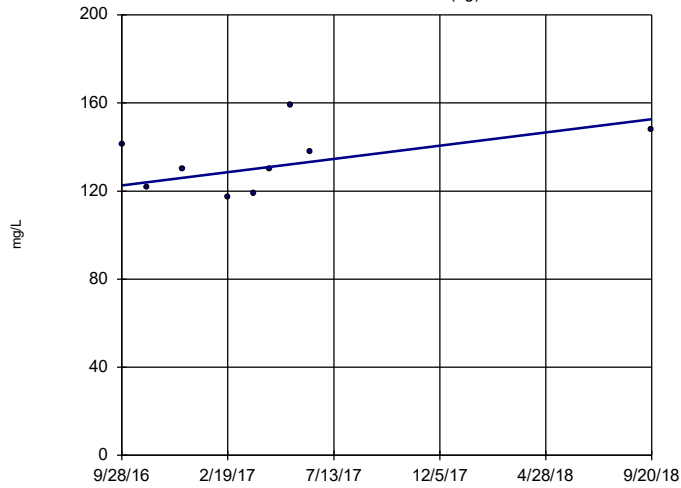


n = 9
 Slope = 0.5123 units per year.
 Mann-Kendall statistic = 18
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/3/2018 8:31 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1601A (bg)

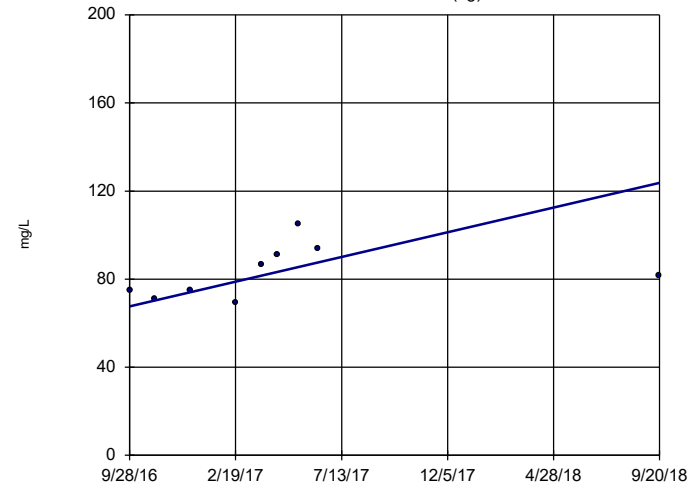


n = 9
 Slope = 15.24
 units per year.
 Mann-Kendall
 statistic = 11
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

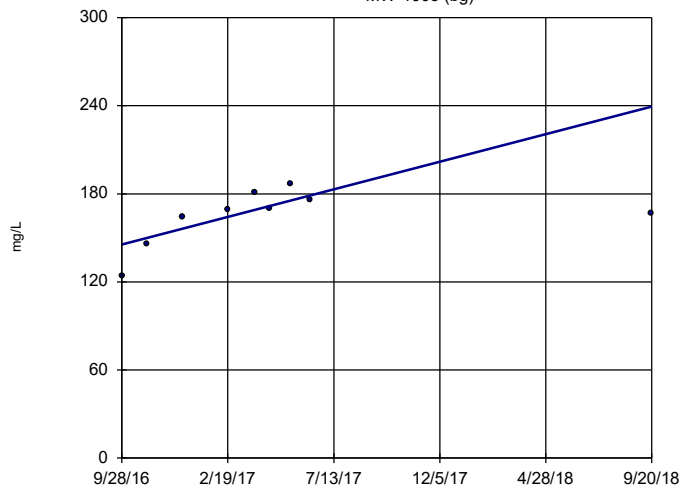


n = 9
 Slope = 28.4
 units per year.
 Mann-Kendall
 statistic = 16
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

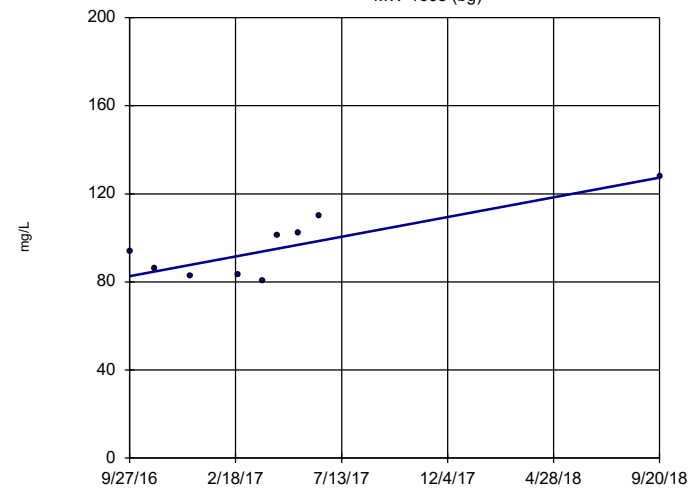


n = 9
 Slope = 47.47
 units per year.
 Mann-Kendall
 statistic = 20
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

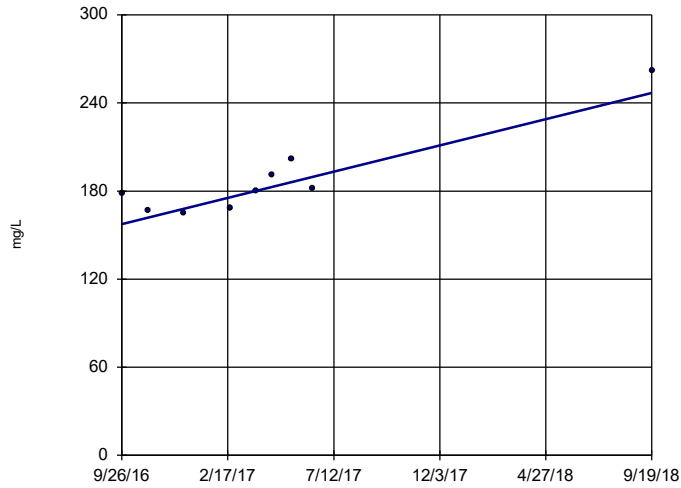


n = 9
 Slope = 22.55
 units per year.
 Mann-Kendall
 statistic = 18
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

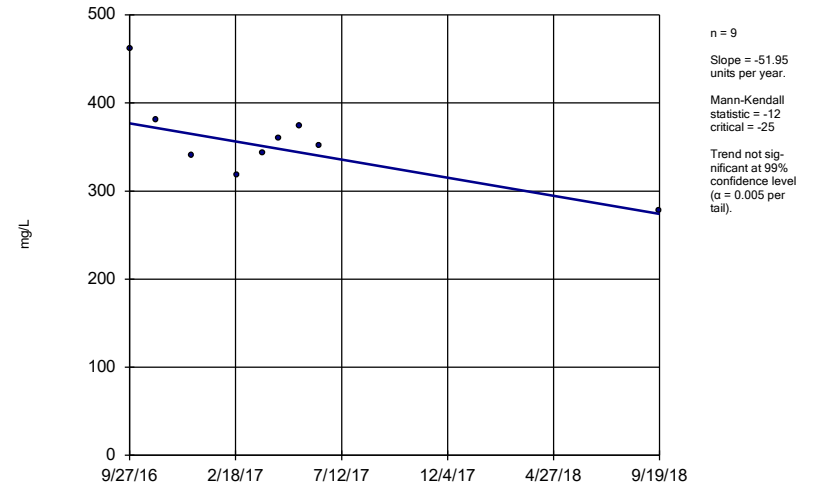
MW-1604S



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

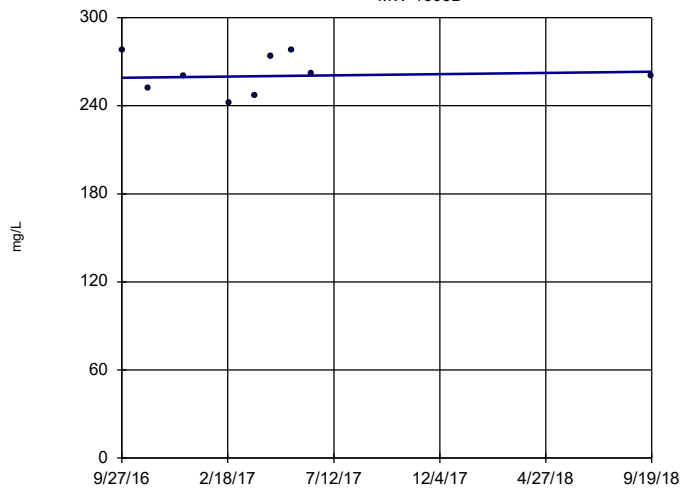
MW-1605D



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

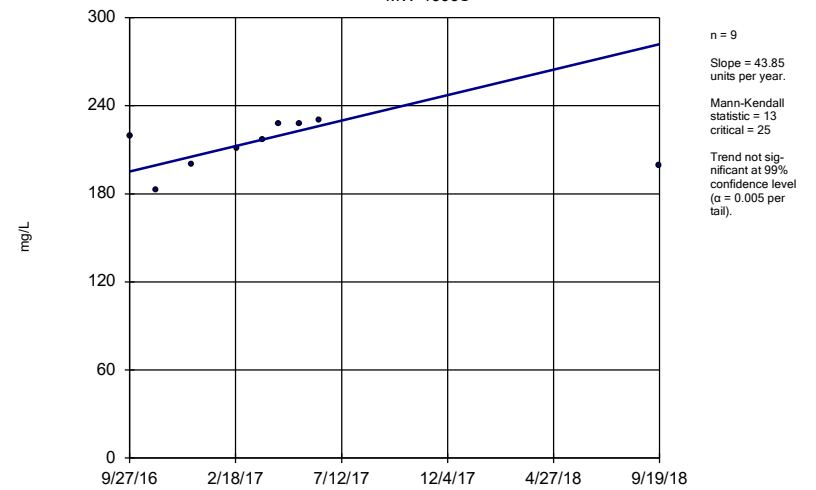
MW-1606D



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

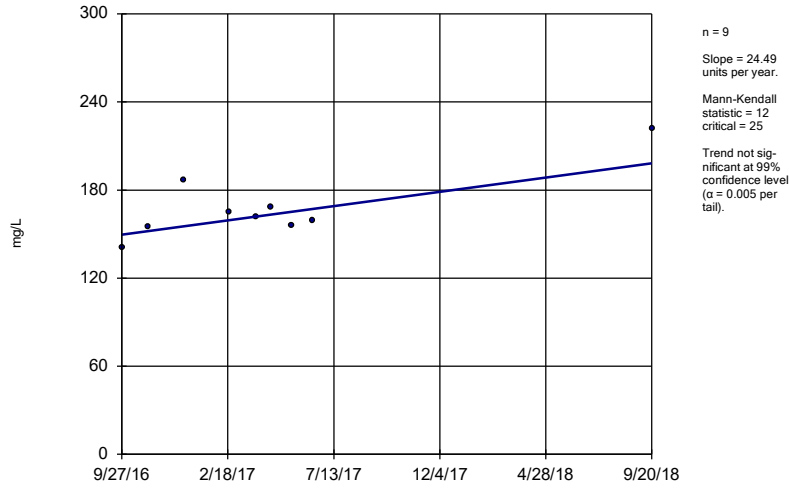
MW-1606S



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

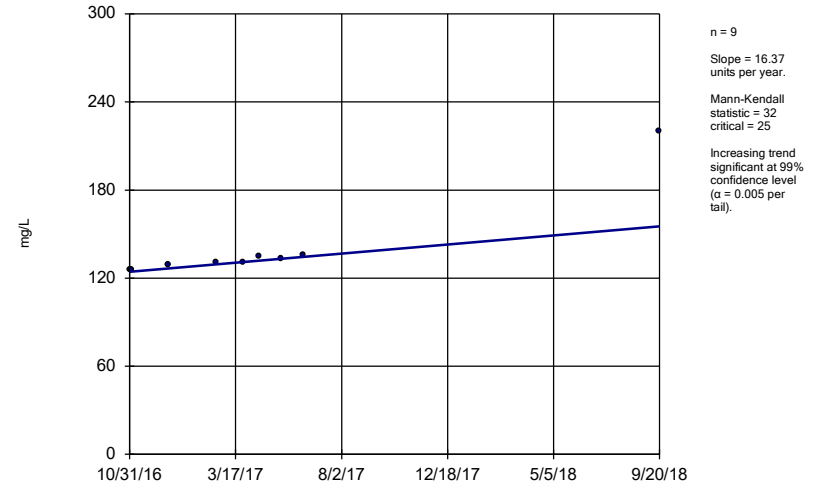
MW-1607D



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

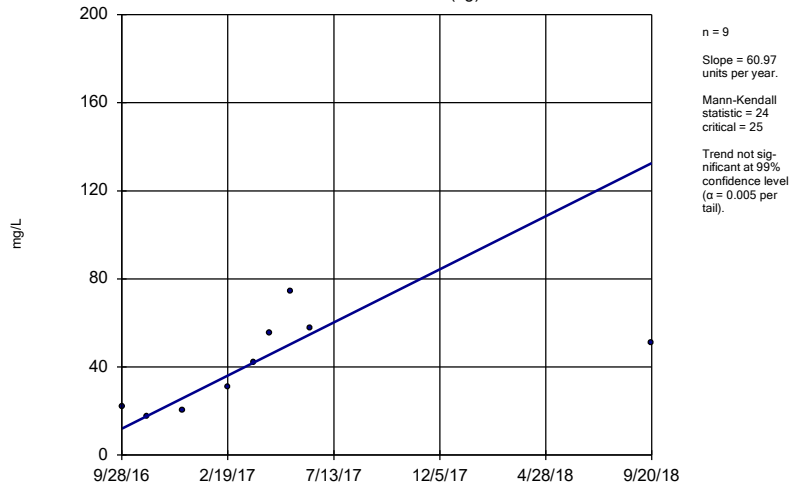
MW-1607S



Constituent: Calcium, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

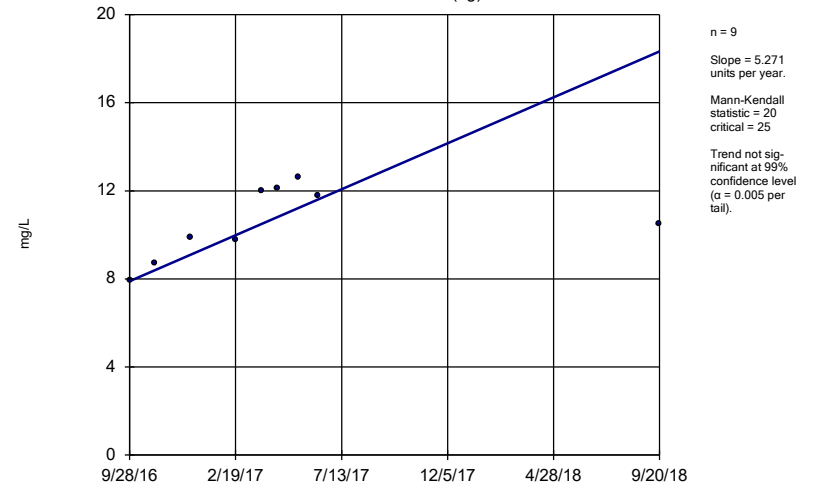
MW-1601A (bg)



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

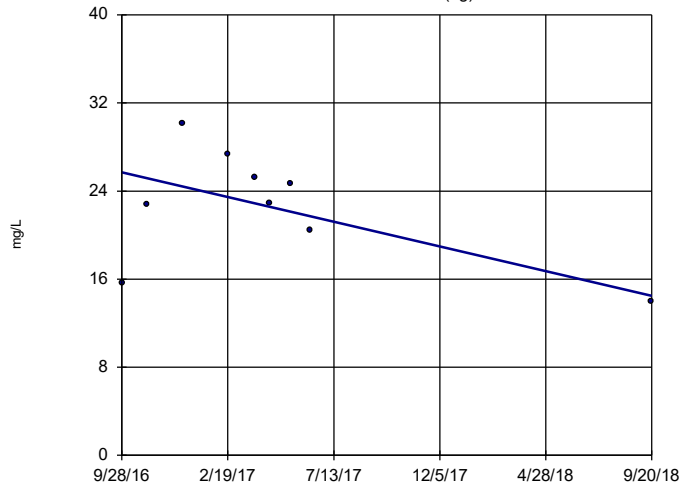
MW-1602 (bg)



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

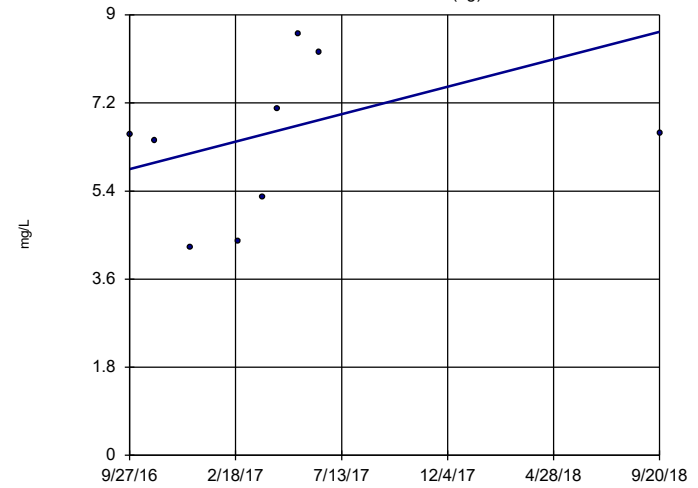


n = 9
 Slope = -5.669 units per year.
 Mann-Kendall statistic = -10
 critical = -25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

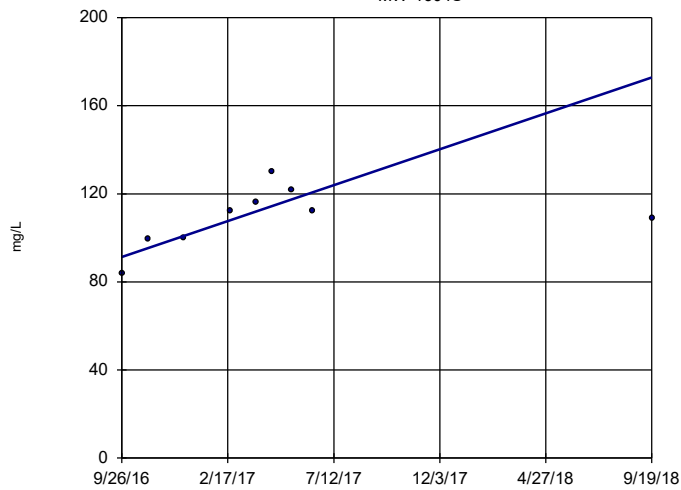


n = 9
 Slope = 1.415 units per year.
 Mann-Kendall statistic = 14
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1604S

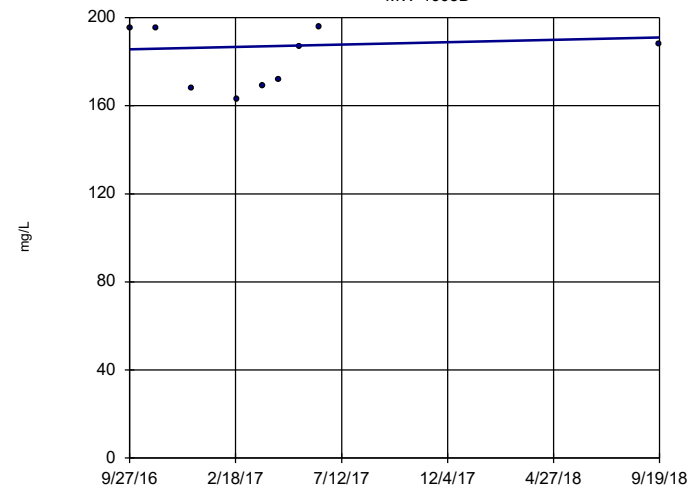


n = 9
 Slope = 41.14 units per year.
 Mann-Kendall statistic = 17
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605D

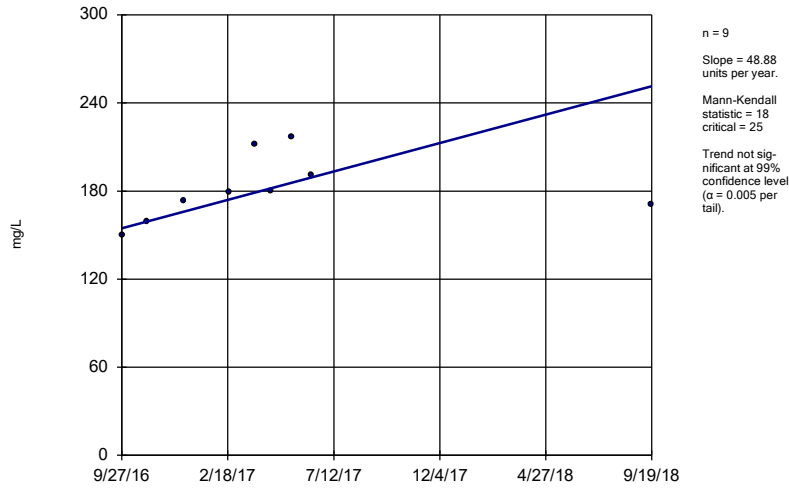


n = 9
 Slope = 2.681 units per year.
 Mann-Kendall statistic = 7
 critical = 25
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

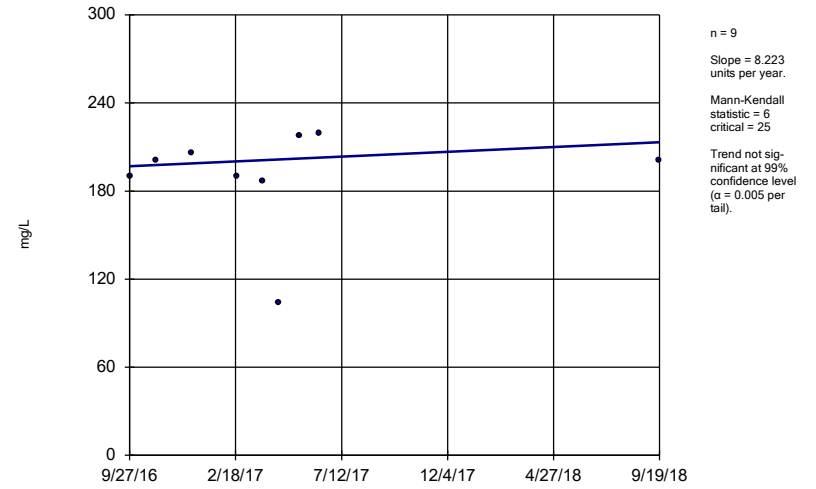
MW-1605S



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

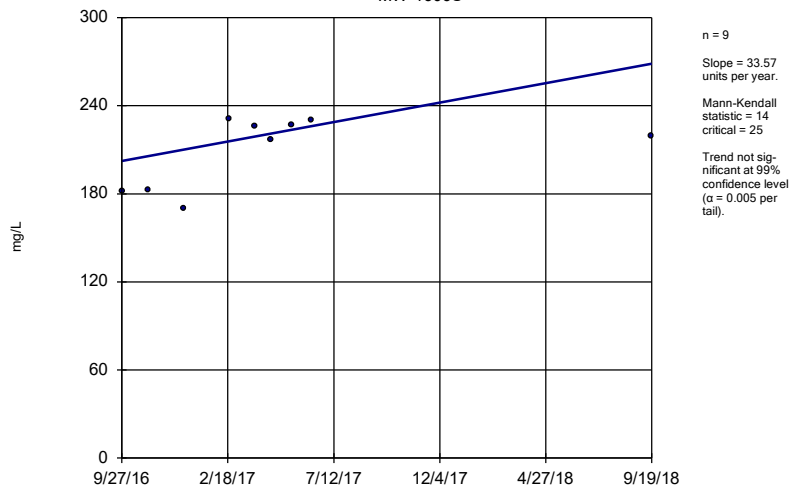
MW-1606D



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

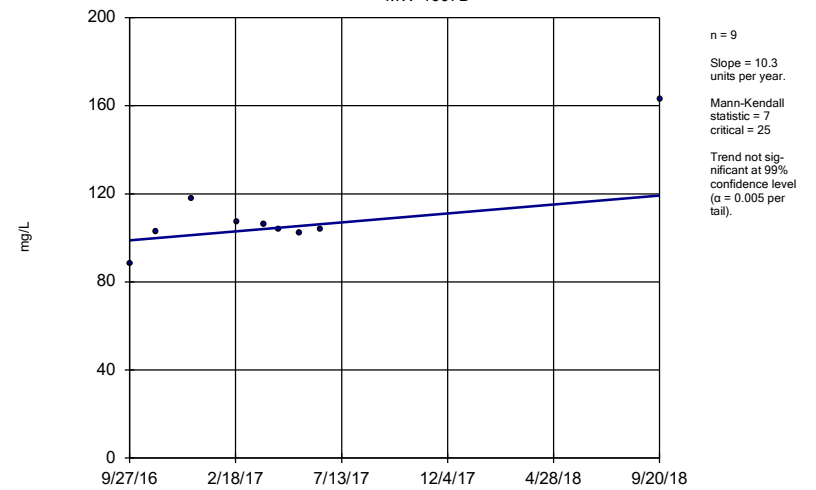
MW-1606S



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

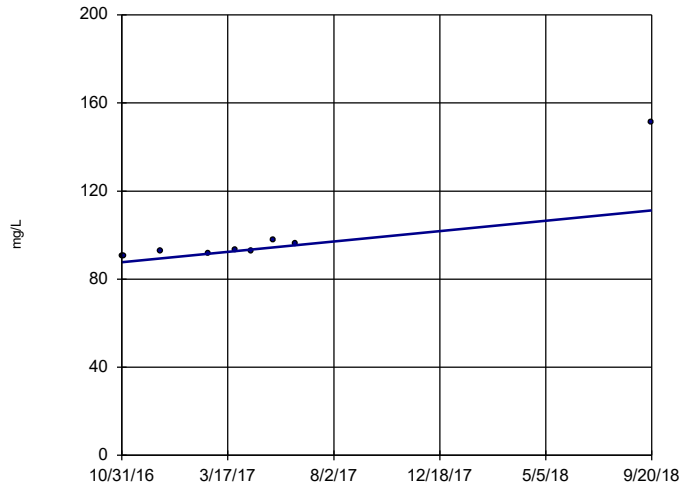
MW-1607D



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

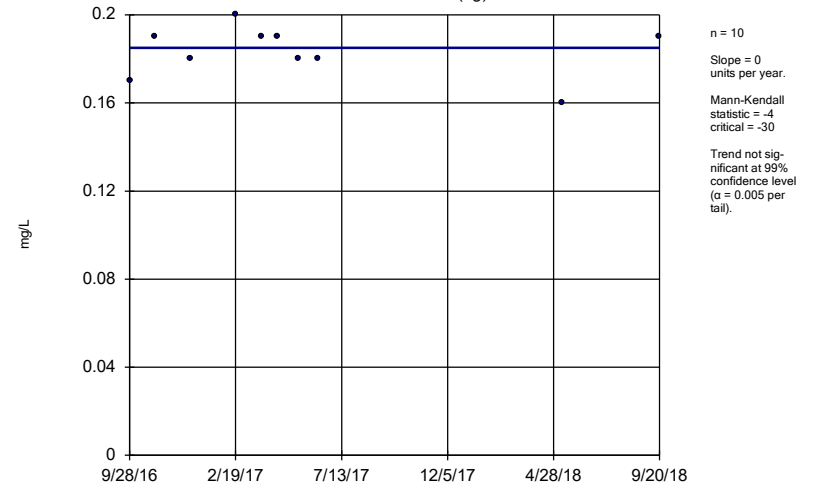
MW-1607S



Constituent: Chloride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

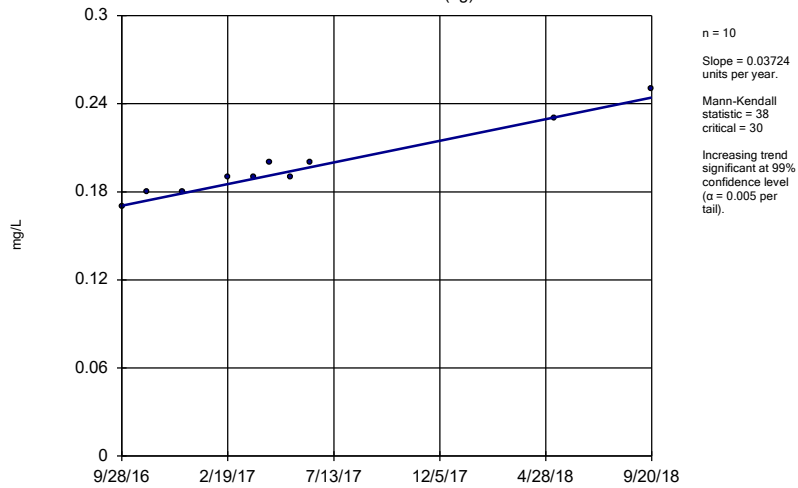
MW-1601A (bg)



Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

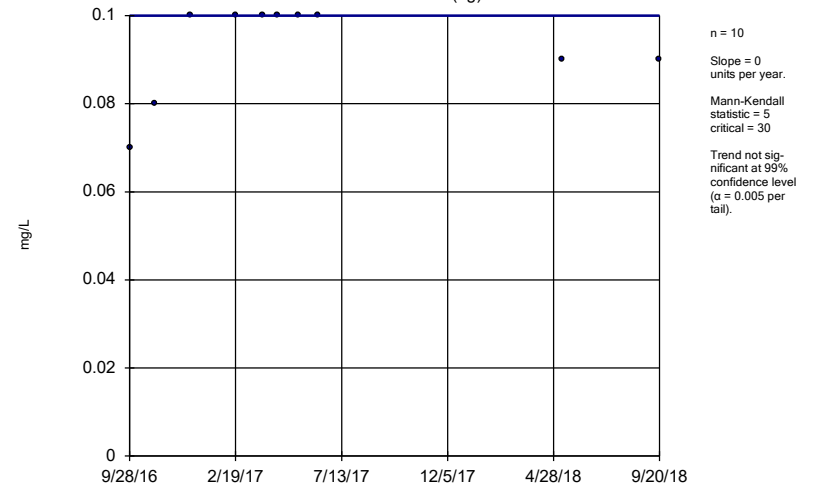
MW-1602 (bg)



Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

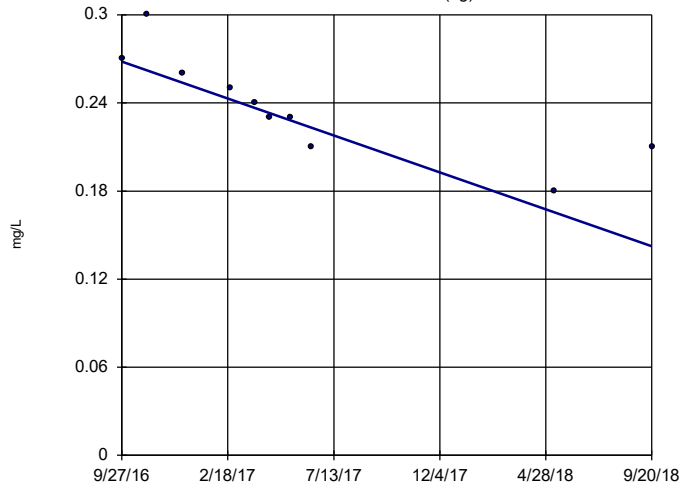
MW-1603 (bg)



Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

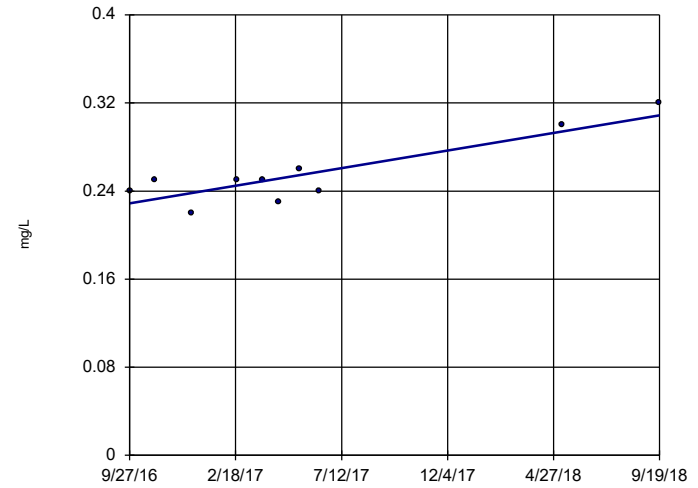


n = 10
 Slope = -0.06348 units per year.
 Mann-Kendall statistic = -39
 critical = -30
 Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605S

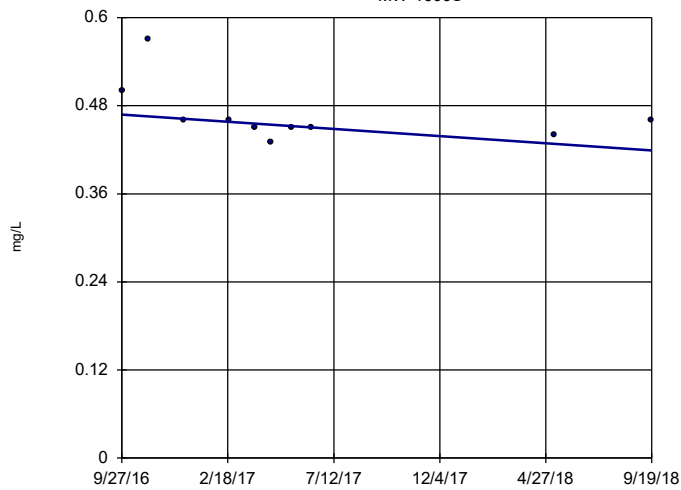


n = 10
 Slope = 0.04044 units per year.
 Mann-Kendall statistic = 21
 critical = 30
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1606S

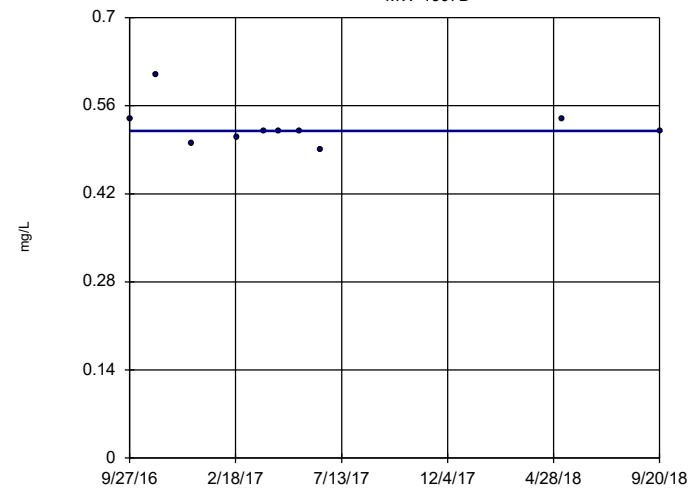


n = 10
 Slope = -0.02483 units per year.
 Mann-Kendall statistic = -21
 critical = -30
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1607D

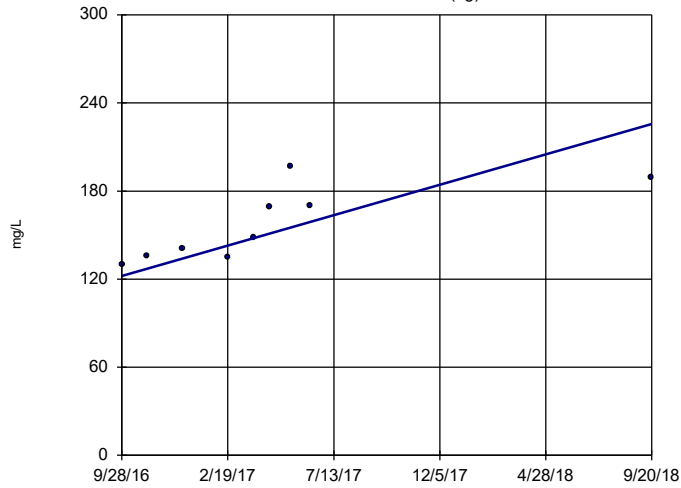


n = 10
 Slope = 0 units per year.
 Mann-Kendall statistic = -4
 critical = -30
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1601A (bg)

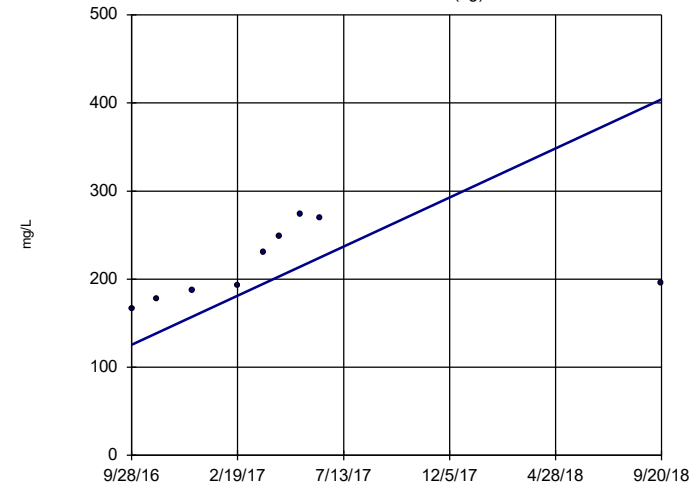


n = 9
 Slope = 52.31 units per year.
 Mann-Kendall statistic = 28
 critical = 25
 Increasing trend significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

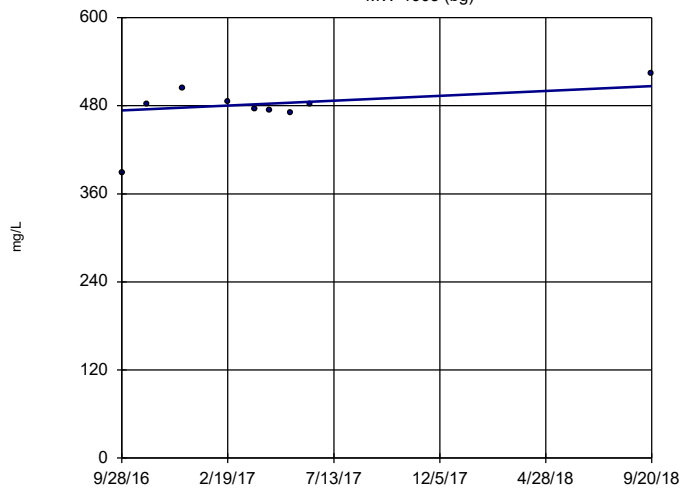


n = 9
 Slope = 140.9 units per year.
 Mann-Kendall statistic = 26
 critical = 25
 Increasing trend significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

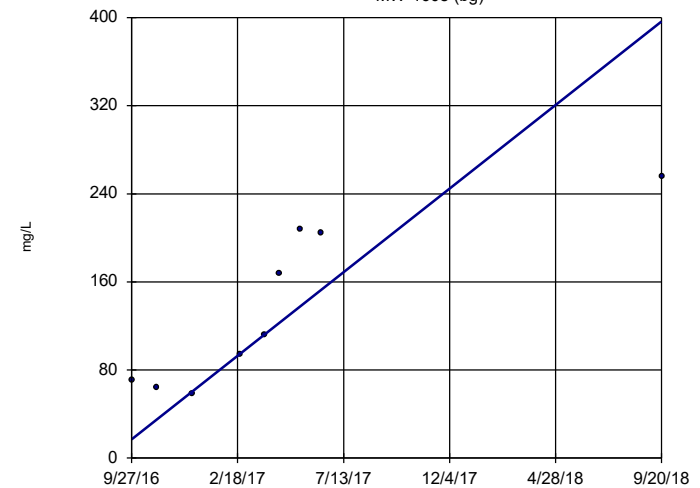


n = 9
 Slope = 16.59 units per year.
 Mann-Kendall statistic = 4
 critical = 25
 Trend not significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

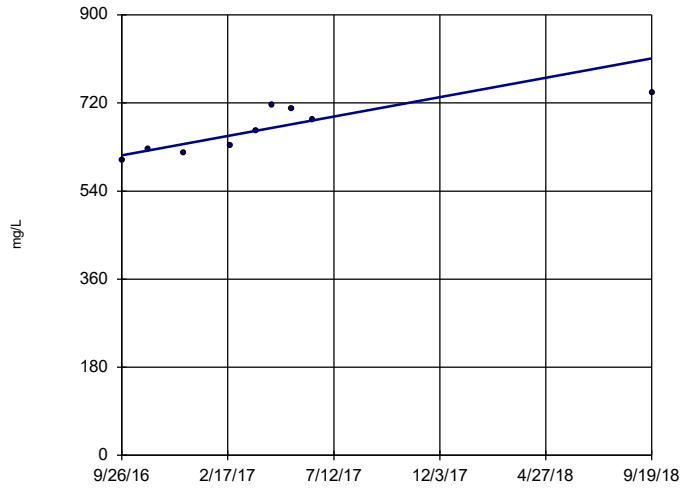


n = 9
 Slope = 191.7 units per year.
 Mann-Kendall statistic = 28
 critical = 25
 Increasing trend significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1604S

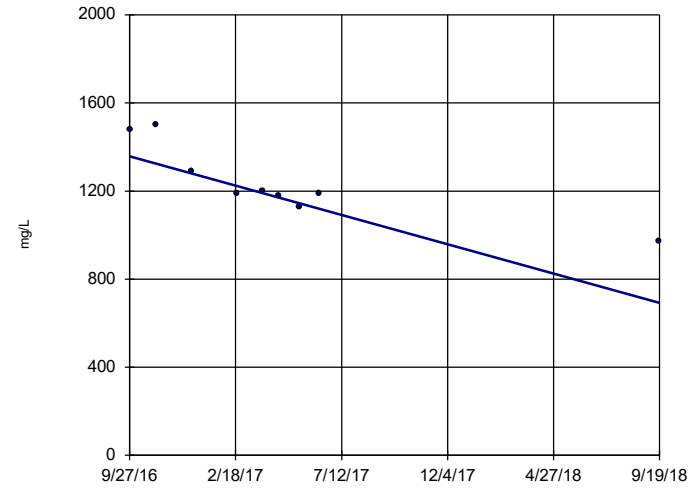


n = 9
 Slope = 100.2 units per year.
 Mann-Kendall statistic = 28
 critical = 25
 Increasing trend significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605D

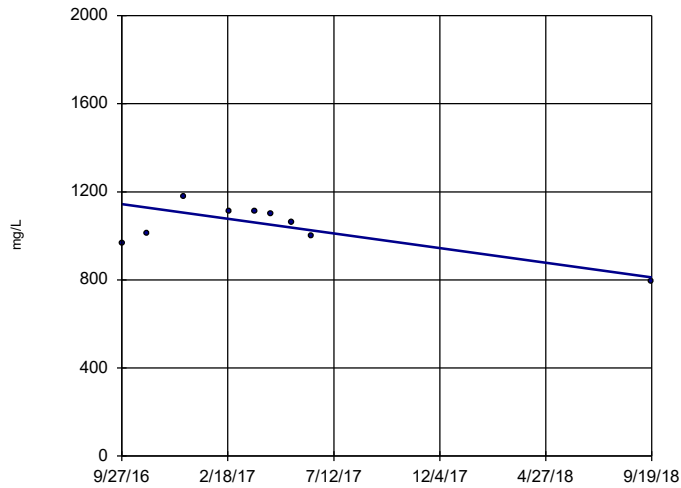


n = 9
 Slope = -336.3 units per year.
 Mann-Kendall statistic = -27
 critical = -25
 Decreasing trend significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605S

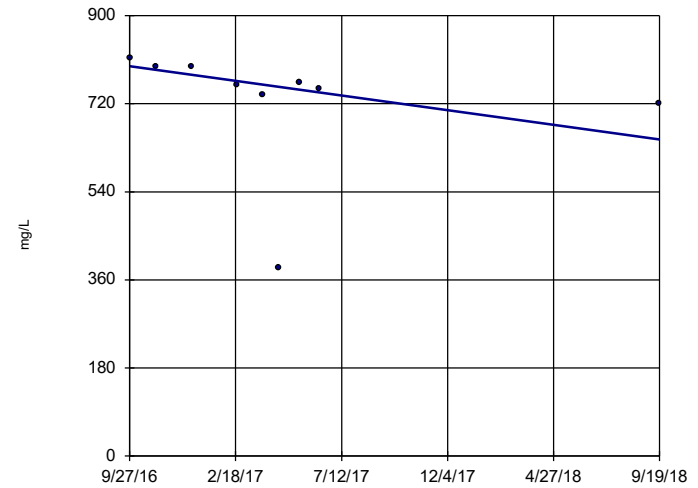


n = 9
 Slope = -168.5 units per year.
 Mann-Kendall statistic = -11
 critical = -25
 Trend not significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1606D

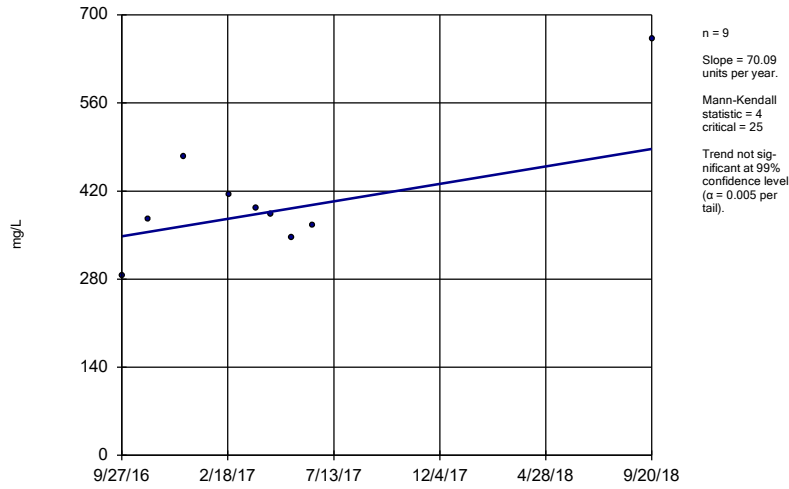


n = 9
 Slope = -75.65 units per year.
 Mann-Kendall statistic = -23
 critical = -25
 Trend not significant at 99% confidence level ($\alpha = 0.005$ per tail).

Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

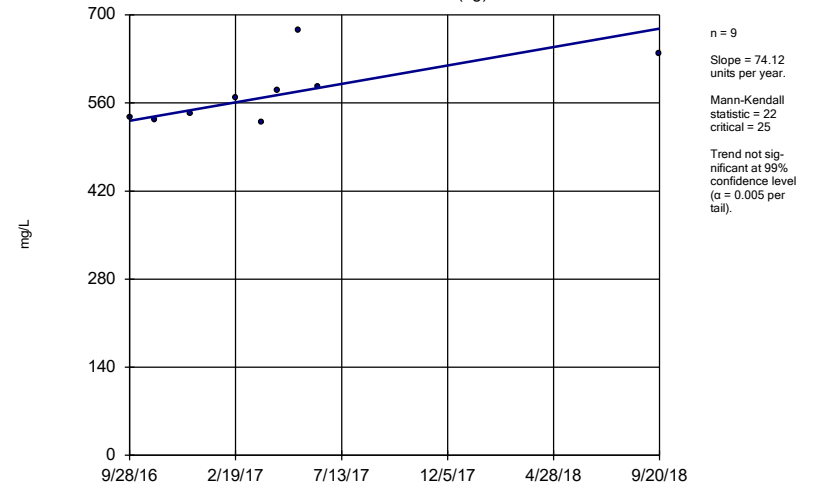
MW-1607D



Constituent: Sulfate, total Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

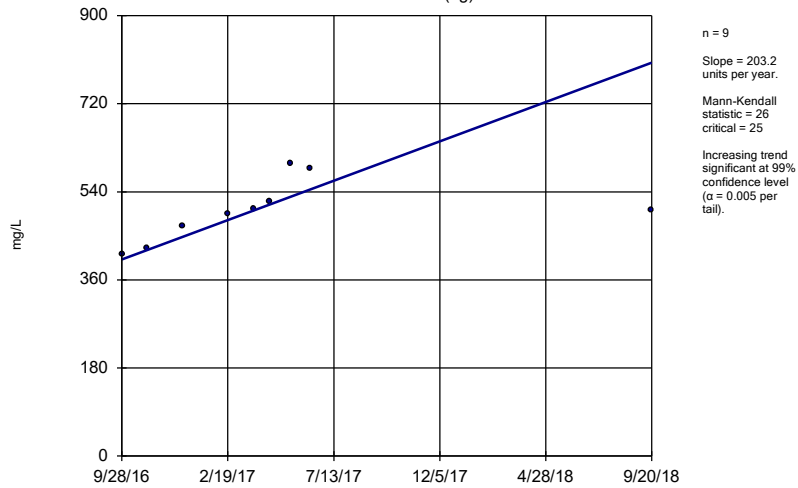
MW-1601A (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

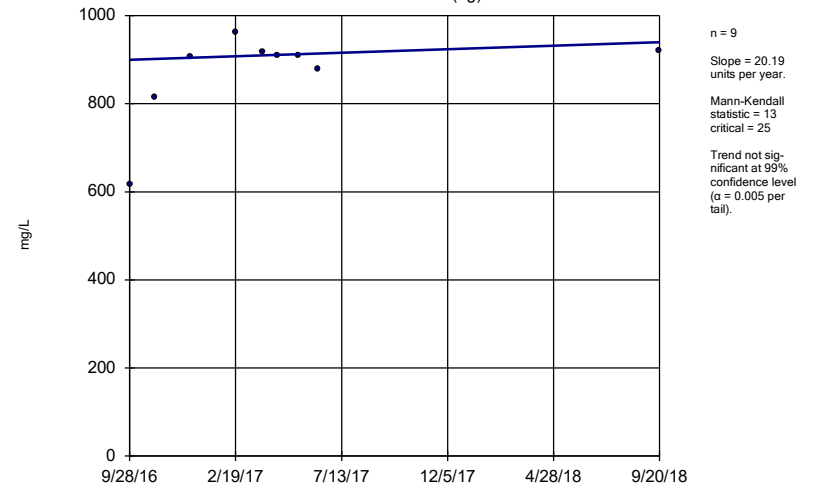
MW-1602 (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

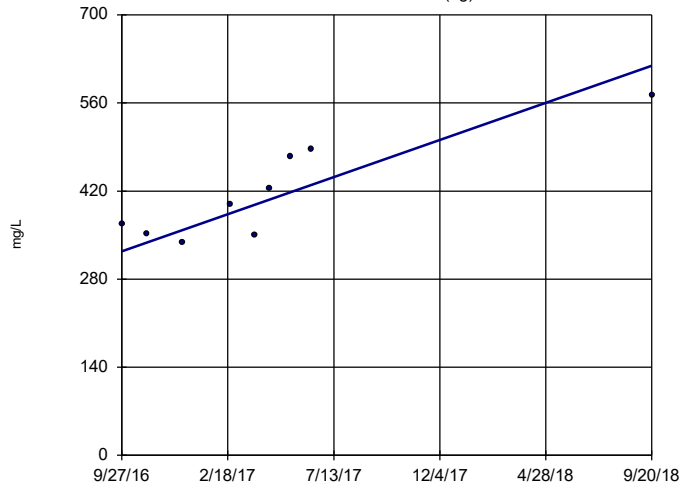
MW-1603 (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

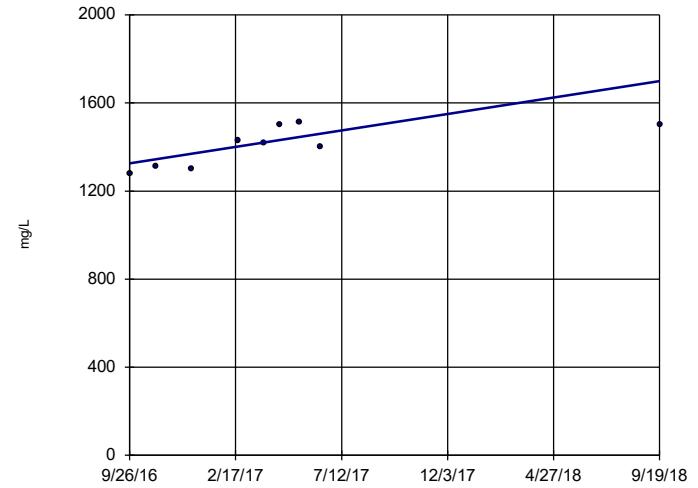


n = 9
 Slope = 149
 units per year.
 Mann-Kendall
 statistic = 24
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1604S

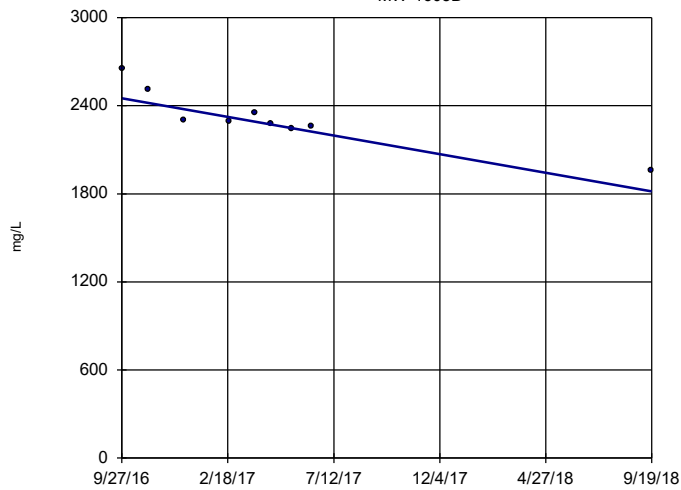


n = 9
 Slope = 188.5
 units per year.
 Mann-Kendall
 statistic = 21
 critical = 25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605D

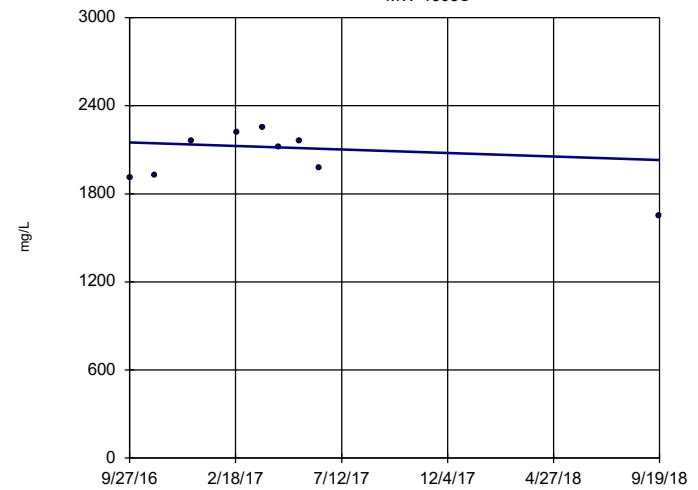


n = 9
 Slope = -320.7
 units per year.
 Mann-Kendall
 statistic = -30
 critical = -25
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1605S

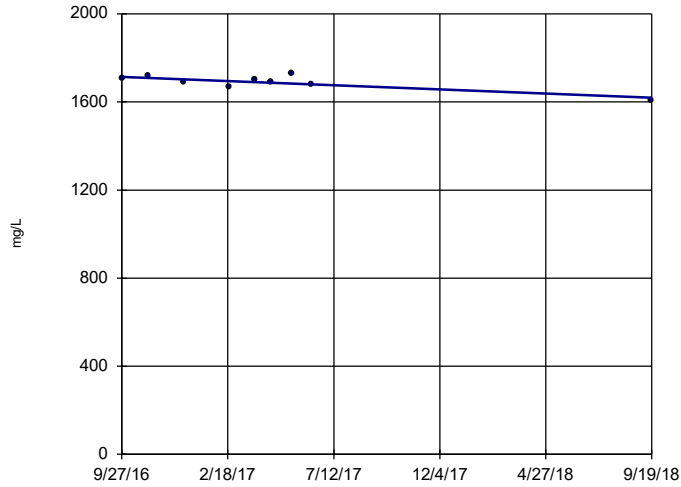


n = 9
 Slope = -61.34
 units per year.
 Mann-Kendall
 statistic = -1
 critical = -25
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

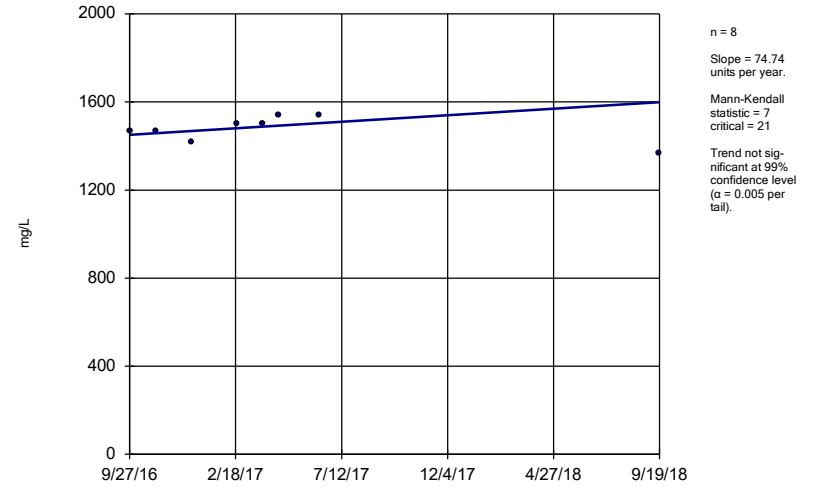
MW-1606D



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

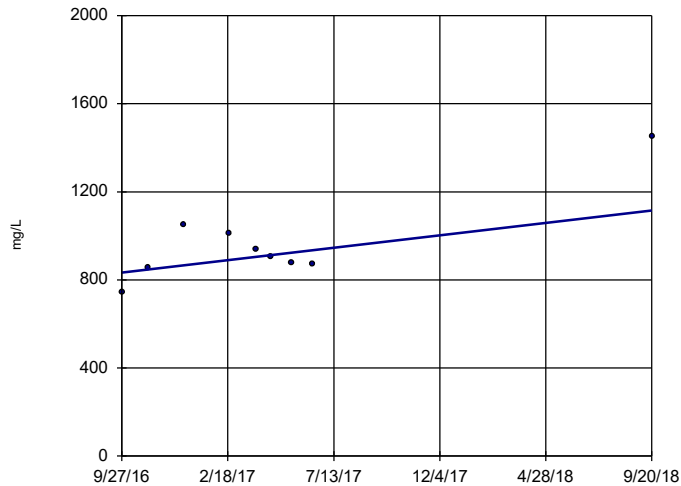
MW-1606S



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

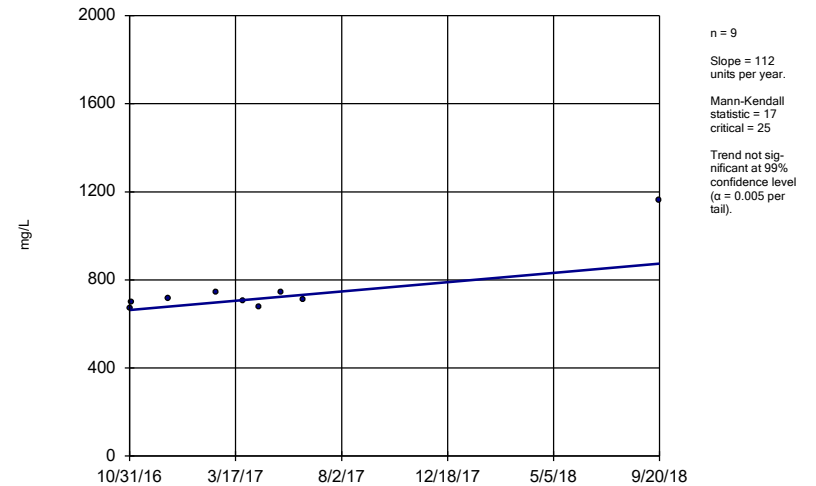
MW-1607D



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1607S



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/3/2018 8:32 AM View: Trend Tests
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Upper Tolerance Limits

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 9:14 AM

Constituent	Upper Lim.	Bg.N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	0.0001	40	n/a	n/a	2.5	n/a	n/a	0.1285	NP Inter(normality)
Arsenic, total (mg/L)	0.0007528	40	0.0004703	0.0001329	0	None	No	0.05	Inter
Barium, total (mg/L)	0.05785	40	-3.311	0.2167	0	None	ln(x)	0.05	Inter
Beryllium, total (mg/L)	0.00002	40	n/a	n/a	85	n/a	n/a	0.1285	NP Inter(NDs)
Cadmium, total (mg/L)	0.00003	40	n/a	n/a	0	n/a	n/a	0.1285	NP Inter(normality)
Chromium, total (mg/L)	0.00193	40	-8.045	0.8441	0	None	ln(x)	0.05	Inter
Cobalt, total (mg/L)	0.0006586	40	-9.087	0.8285	0	None	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	2.36	40	0.8419	0.3265	0	None	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.301	40	0.178	0.05788	0	None	No	0.05	Inter
Lead, total (mg/L)	0.0005165	40	0.04708	0.01559	0	None	x^(1/3)	0.05	Inter
Lithium, total (mg/L)	0.03084	40	0.0924	0.03915	7.5	None	sqrt(x)	0.05	Inter
Mercury, total (mg/L)	0.000005	40	n/a	n/a	90	n/a	n/a	0.1285	NP Inter(NDs)
Molybdenum, total (mg/L)	0.002886	40	0.001248	0.0007705	0	None	No	0.05	Inter
Selenium, total (mg/L)	0.0015	40	n/a	n/a	0	n/a	n/a	0.1285	NP Inter(normality)
Thallium, total (mg/L)	0.00009255	40	0.005606	0.001888	2.5	None	sqrt(x)	0.05	Inter

Confidence Intervals - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:57 AM

<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>
Lithium, total (mg/L)	MW-1605D	0.08226	0.06534	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1605S	0.08143	0.05937	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1606D	0.1276	0.1108	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1606S	0.1183	0.1023	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1607D	0.09185	0.07175	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1607S	0.1086	0.09178	0.04	Yes	10	0	No	0.01	Param.

Confidence Intervals - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:57 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	MW-1604D	0.000147	0.00008903	0.006	No	10	0	x^2	0.01	Param.
Antimony, total (mg/L)	MW-1604S	0.00013	0.00003	0.006	No	10	0	No	0.011	NP (normality)
Antimony, total (mg/L)	MW-1605D	0.00004	0.00003	0.006	No	10	0	No	0.011	NP (normality)
Antimony, total (mg/L)	MW-1605S	0.0000839	0.00003655	0.006	No	10	0	ln(x)	0.01	Param.
Antimony, total (mg/L)	MW-1606D	0.00019	0.00015	0.006	No	10	0	No	0.011	NP (normality)
Antimony, total (mg/L)	MW-1606S	0.0001642	0.0001418	0.006	No	10	0	No	0.01	Param.
Antimony, total (mg/L)	MW-1607D	0.00004	0.00003	0.006	No	10	0	No	0.011	NP (normality)
Antimony, total (mg/L)	MW-1607S	0.00055	0.00042	0.006	No	10	0	No	0.011	NP (normality)
Arsenic, total (mg/L)	MW-1604D	0.0005475	0.0003765	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1604S	0.0004585	0.0003555	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605D	0.002428	0.00211	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605S	0.001033	0.0005754	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1606D	0.0008752	0.0004153	0.01	No	10	0	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1606S	0.0009003	0.0007577	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607D	0.001208	0.0009743	0.01	No	10	0	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607S	0.001549	0.0009483	0.01	No	9	0	No	0.01	Param.
Barium, total (mg/L)	MW-1604D	0.03213	0.02689	2	No	10	0	x^(1/3)	0.01	Param.
Barium, total (mg/L)	MW-1604S	0.03045	0.02687	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1605D	0.02956	0.02462	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1605S	0.04036	0.02682	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1606D	0.06149	0.05171	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1606S	0.0769	0.06996	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1607D	0.1511	0.1019	2	No	10	0	No	0.01	Param.
Barium, total (mg/L)	MW-1607S	0.07271	0.05814	2	No	9	0	No	0.01	Param.
Beryllium, total (mg/L)	MW-1604D	0.00002	0.00002	0.004	No	10	100	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1604S	0.00002	0.00002	0.004	No	10	90	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1605D	0.00002	0.00002	0.004	No	10	100	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1605S	0.00002	0.000007	0.004	No	10	70	No	0.011	NP (normality)
Beryllium, total (mg/L)	MW-1606D	0.00002	0.000004	0.004	No	10	60	No	0.011	NP (normality)
Beryllium, total (mg/L)	MW-1606S	0.00002	0.000005	0.004	No	10	90	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1607D	0.00002	0.000008	0.004	No	10	90	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1607S	0.00002	0.000007	0.004	No	10	60	No	0.011	NP (normality)
Cadmium, total (mg/L)	MW-1604D	0.0001592	0.00007084	0.005	No	10	0	No	0.01	Param.
Cadmium, total (mg/L)	MW-1604S	0.00015	0.00003	0.005	No	10	0	No	0.011	NP (normality)
Cadmium, total (mg/L)	MW-1605D	0.00003882	0.00001918	0.005	No	10	0	No	0.01	Param.
Cadmium, total (mg/L)	MW-1605S	0.00008	0.00005	0.005	No	10	0	No	0.011	NP (normality)
Cadmium, total (mg/L)	MW-1606D	0.00007638	0.00006205	0.005	No	10	0	x^3	0.01	Param.
Cadmium, total (mg/L)	MW-1606S	0.00008146	0.00006454	0.005	No	10	0	No	0.01	Param.
Cadmium, total (mg/L)	MW-1607D	0.00002	0.000005	0.005	No	10	60	No	0.011	NP (normality)
Cadmium, total (mg/L)	MW-1607S	0.00006	0.00002	0.005	No	10	0	No	0.011	NP (normality)
Chromium, total (mg/L)	MW-1604D	0.0005216	0.0001498	0.1	No	10	0	No	0.01	Param.
Chromium, total (mg/L)	MW-1604S	0.0005807	0.0001015	0.1	No	10	0	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1605D	0.0005311	0.00008298	0.1	No	10	0	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1605S	0.001104	0.0001965	0.1	No	10	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1606D	0.0006749	0.0001734	0.1	No	10	0	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1606S	0.0006344	0.00009926	0.1	No	10	0	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1607D	0.0007252	0.00006417	0.1	No	10	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1607S	0.0008722	0.0001432	0.1	No	10	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1604D	0.001902	0.001301	0.006	No	10	0	x^3	0.01	Param.
Cobalt, total (mg/L)	MW-1604S	0.00183	0.000307	0.006	No	10	0	No	0.011	NP (normality)
Cobalt, total (mg/L)	MW-1605D	0.001854	0.00164	0.006	No	10	0	No	0.01	Param.
Cobalt, total (mg/L)	MW-1605S	0.001475	0.0004285	0.006	No	10	0	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	MW-1606D	0.0022	0.00117	0.006	No	10	0	No	0.011	NP (normality)
Cobalt, total (mg/L)	MW-1606S	0.0003873	0.0002411	0.006	No	10	0	No	0.01	Param.
Cobalt, total (mg/L)	MW-1607D	0.000769	0.000396	0.006	No	10	0	No	0.011	NP (normality)

Confidence Intervals - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:57 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt, total (mg/L)	MW-1607S	0.0026	0.000752	0.006	No	10	0	No	0.011	NP (normality)
Combined Radium 226 + 228 (pCi/L)	MW-1604D	1.909	0.5872	5	No	10	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604S	1.424	0.5484	5	No	9	0	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605D	2.096	0.5645	5	No	10	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605S	1.458	0.3561	5	No	10	0	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606D	3.902	0.6694	5	No	10	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606S	1.644	0.6102	5	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607D	2.246	0.9231	5	No	10	0	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607S	2.32	1.022	5	No	10	0	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604D	0.2019	0.1781	4	No	10	0	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604S	0.2146	0.1954	4	No	10	0	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605D	0.2133	0.1807	4	No	10	0	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605S	0.2836	0.2284	4	No	10	0	No	0.01	Param.
Fluoride, total (mg/L)	MW-1606D	0.26	0.24	4	No	10	0	No	0.011	NP (normality)
Fluoride, total (mg/L)	MW-1606S	0.5	0.43	4	No	10	0	No	0.011	NP (normality)
Fluoride, total (mg/L)	MW-1607D	0.54	0.49	4	No	10	0	No	0.011	NP (normality)
Fluoride, total (mg/L)	MW-1607S	0.3129	0.2791	4	No	10	0	No	0.01	Param.
Lead, total (mg/L)	MW-1604D	0.000303	0.00002	0.015	No	10	0	No	0.011	NP (normality)
Lead, total (mg/L)	MW-1604S	0.0001057	0.00003526	0.015	No	10	0	No	0.01	Param.
Lead, total (mg/L)	MW-1605D	0.00004138	0.00001242	0.015	No	10	0	x^(1/3)	0.01	Param.
Lead, total (mg/L)	MW-1605S	0.0009624	0.0001231	0.015	No	10	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1606D	0.0006317	0.00003806	0.015	No	10	0	x^(1/3)	0.01	Param.
Lead, total (mg/L)	MW-1606S	0.0001693	0.00004293	0.015	No	10	0	No	0.01	Param.
Lead, total (mg/L)	MW-1607D	0.000179	0.000038	0.015	No	10	0	No	0.011	NP (normality)
Lead, total (mg/L)	MW-1607S	0.0014	0.000094	0.015	No	10	0	No	0.011	NP (normality)
Lithium, total (mg/L)	MW-1604D	0.05993	0.03714	0.04	No	10	0	x^2	0.01	Param.
Lithium, total (mg/L)	MW-1604S	0.04601	0.03039	0.04	No	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1605D	0.08226	0.06534	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1605S	0.08143	0.05937	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1606D	0.1276	0.1108	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1606S	0.1183	0.1023	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1607D	0.09185	0.07175	0.04	Yes	10	0	No	0.01	Param.
Lithium, total (mg/L)	MW-1607S	0.1086	0.09178	0.04	Yes	10	0	No	0.01	Param.
Mercury, total (mg/L)	MW-1604D	0.000005	0.000003	0.002	No	10	80	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1604S	0.000005	0.000003	0.002	No	10	90	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1605D	0.000005	0.000002	0.002	No	10	90	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1605S	0.000005	0.000003	0.002	No	10	90	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1606D	0.000005	0.000004	0.002	No	10	90	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1606S	0.000005	0.000002	0.002	No	10	90	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1607D	0.000005	0.000002	0.002	No	10	80	No	0.011	NP (NDs)
Mercury, total (mg/L)	MW-1607S	0.000005	0.000003	0.002	No	9	77.78	No	0.002	NP (NDs)
Molybdenum, total (mg/L)	MW-1604D	0.01989	0.01465	0.1	No	10	0	x^4	0.01	Param.
Molybdenum, total (mg/L)	MW-1604S	0.0162	0.00241	0.1	No	9	0	No	0.002	NP (normality)
Molybdenum, total (mg/L)	MW-1605D	0.05207	0.04477	0.1	No	10	0	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1605S	0.02275	0.01593	0.1	No	10	0	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1606D	0.08108	0.07086	0.1	No	10	0	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1606S	0.1055	0.08	0.1	No	10	0	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1607D	0.09219	0.08353	0.1	No	10	0	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1607S	0.04809	0.04171	0.1	No	10	0	No	0.01	Param.
Selenium, total (mg/L)	MW-1604D	0.0014	0.0005	0.05	No	10	0	No	0.011	NP (normality)
Selenium, total (mg/L)	MW-1604S	0.002719	0.001421	0.05	No	10	0	No	0.01	Param.
Selenium, total (mg/L)	MW-1605D	0.0003	0.0002	0.05	No	10	0	No	0.011	NP (normality)
Selenium, total (mg/L)	MW-1605S	0.002039	0.0008007	0.05	No	10	0	No	0.01	Param.
Selenium, total (mg/L)	MW-1606D	0.00576	0.0026	0.05	No	10	0	No	0.01	Param.
Selenium, total (mg/L)	MW-1606S	0.002	0.0007	0.05	No	10	0	No	0.011	NP (normality)

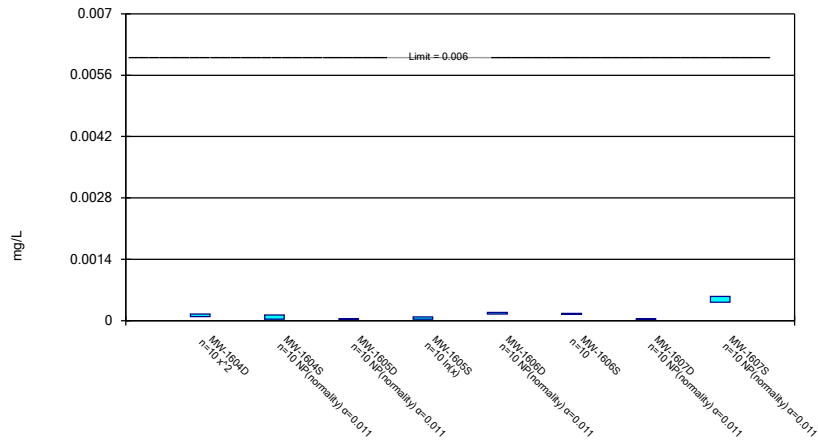
Confidence Intervals - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 12/3/2018, 6:57 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Selenium, total (mg/L)	MW-1607D	0.0001	0.00003	0.05	No	10	20	No	0.011	NP (normality)
Selenium, total (mg/L)	MW-1607S	0.01003	0.007828	0.05	No	10	0	No	0.01	Param.
Thallium, total (mg/L)	MW-1604D	0.0002929	0.0001575	0.002	No	10	0	x^2	0.01	Param.
Thallium, total (mg/L)	MW-1604S	0.00022	0.00002	0.002	No	10	0	No	0.011	NP (normality)
Thallium, total (mg/L)	MW-1605D	0.00009	0.00004	0.002	No	10	0	No	0.011	NP (normality)
Thallium, total (mg/L)	MW-1605S	0.000102	0.00004	0.002	No	10	0	No	0.011	NP (normality)
Thallium, total (mg/L)	MW-1606D	0.0001133	0.00009009	0.002	No	10	0	No	0.01	Param.
Thallium, total (mg/L)	MW-1606S	0.00009256	0.00006184	0.002	No	10	0	No	0.01	Param.
Thallium, total (mg/L)	MW-1607D	0.00004948	0.00002492	0.002	No	10	0	No	0.01	Param.
Thallium, total (mg/L)	MW-1607S	0.000089	0.00005	0.002	No	9	0	No	0.002	NP (normality)

Parametric and Non-Parametric (NP) Confidence Interval

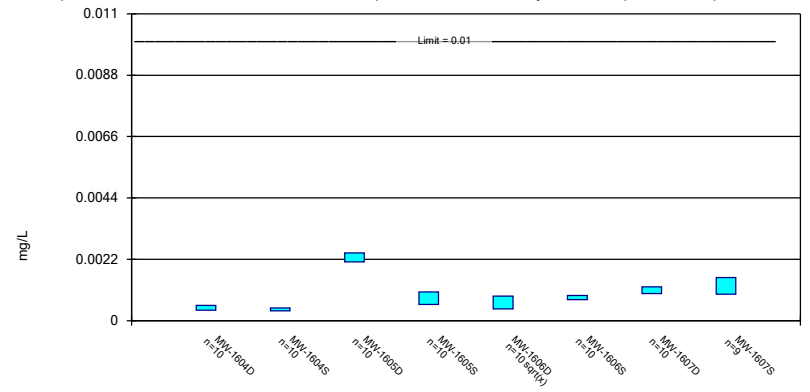
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 12/3/2018 6:55 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

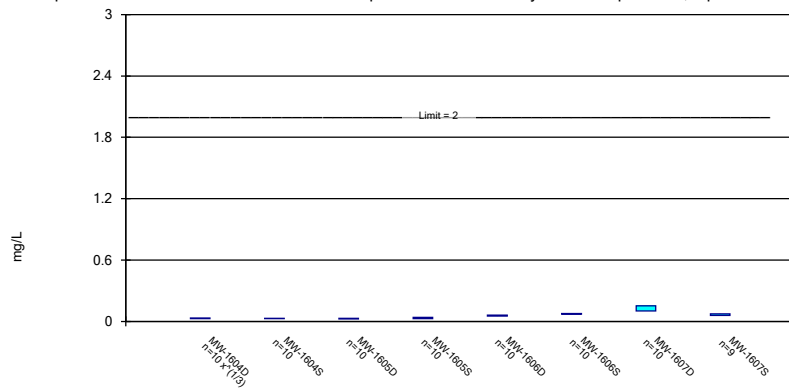
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 12/3/2018 6:55 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

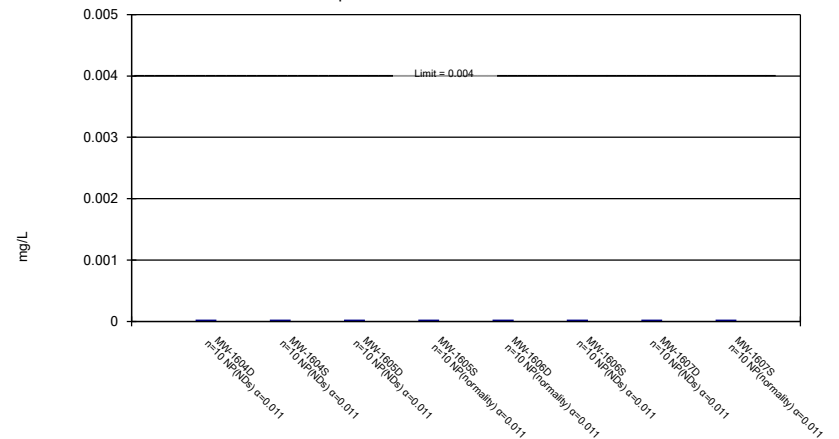
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 12/3/2018 6:55 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

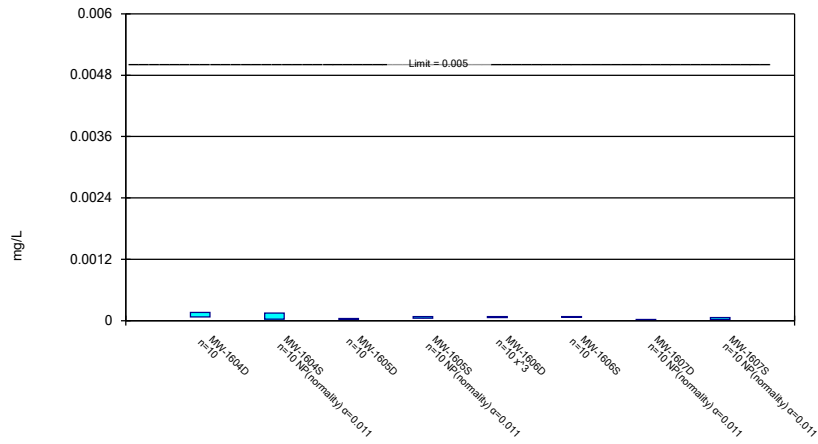
Compliance Limit is not exceeded.



Constituent: Beryllium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

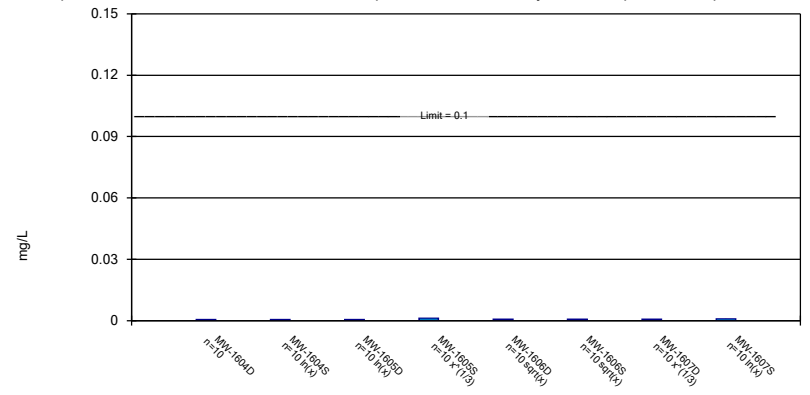
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

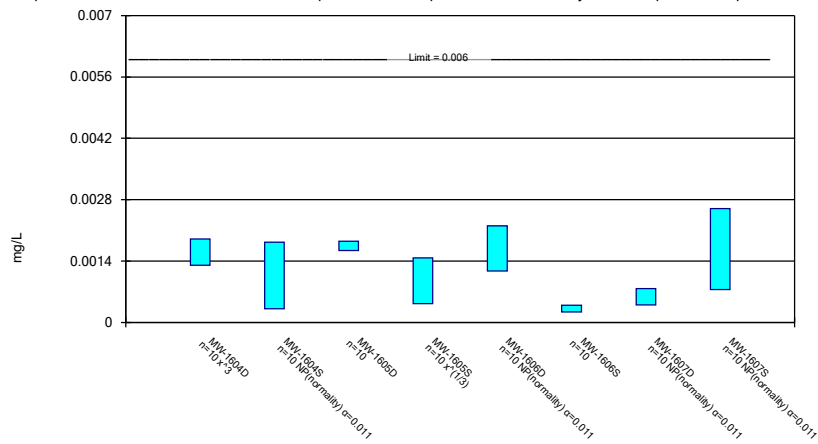
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

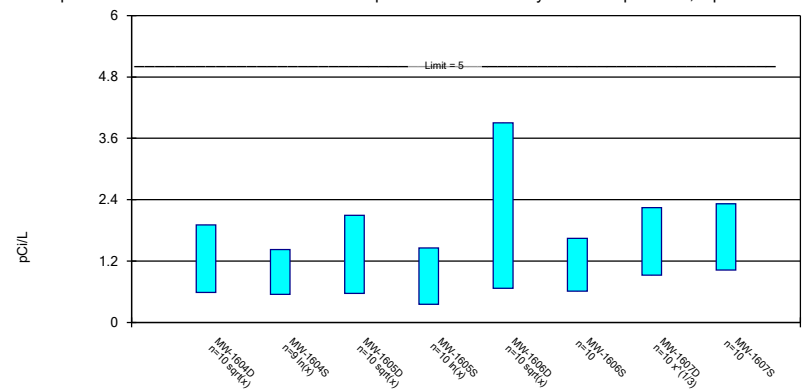
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

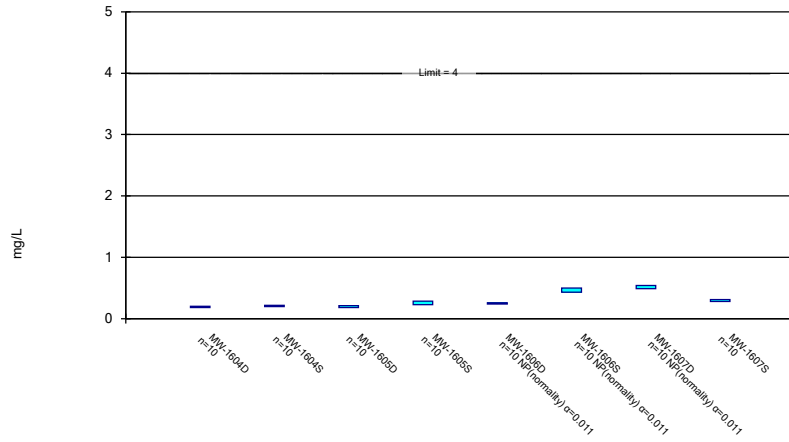
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals -
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

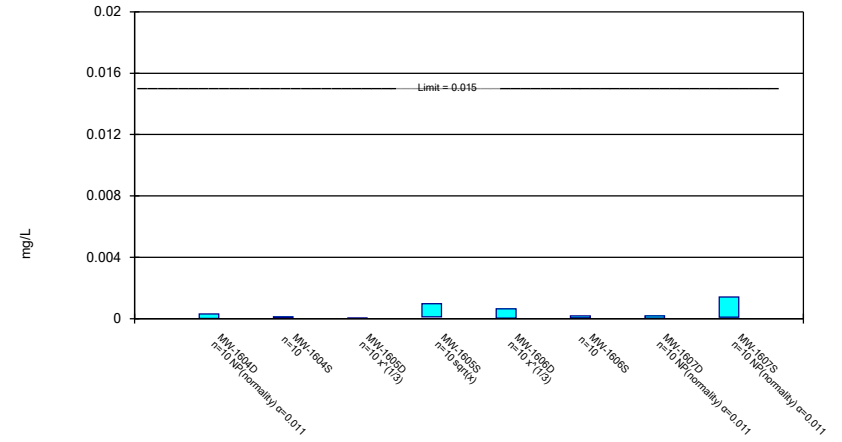
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

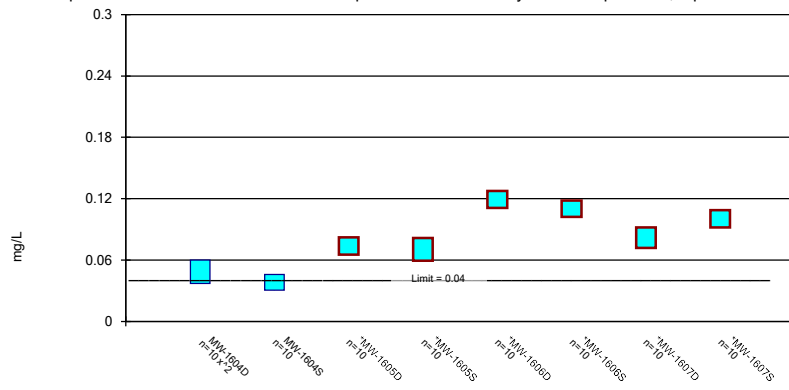
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

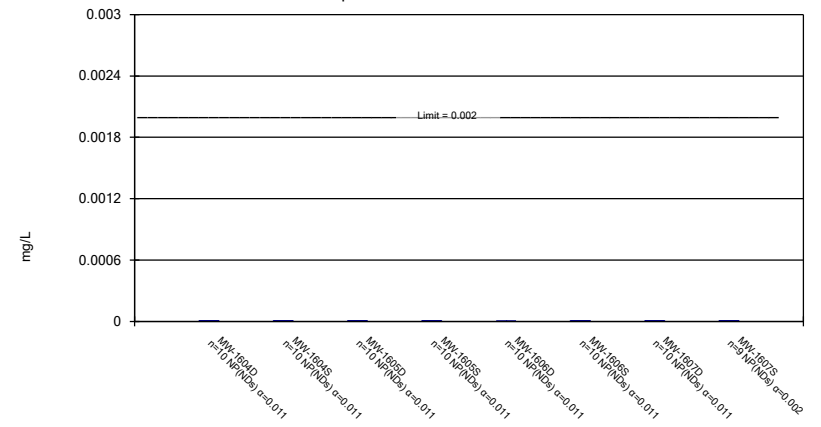
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

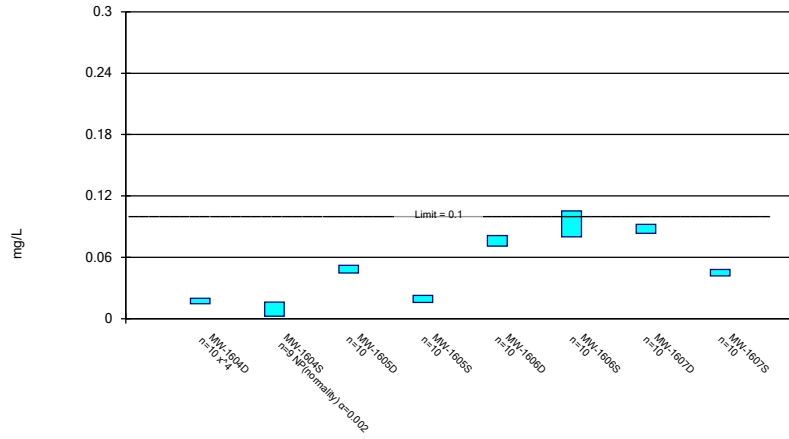
Compliance Limit is not exceeded.



Constituent: Mercury, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

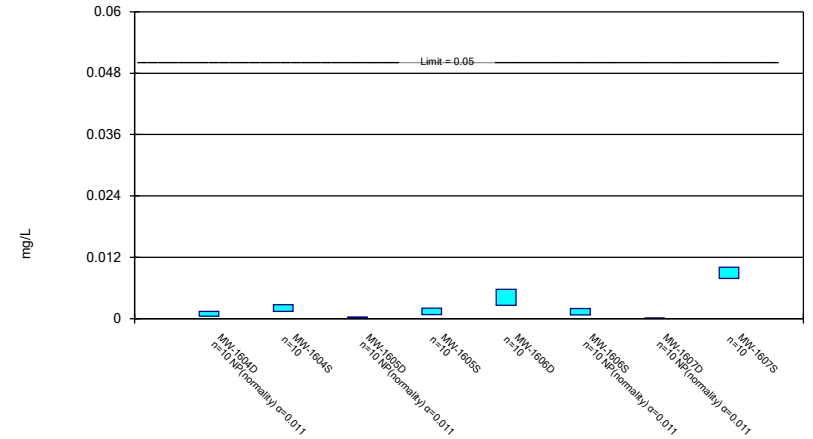
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

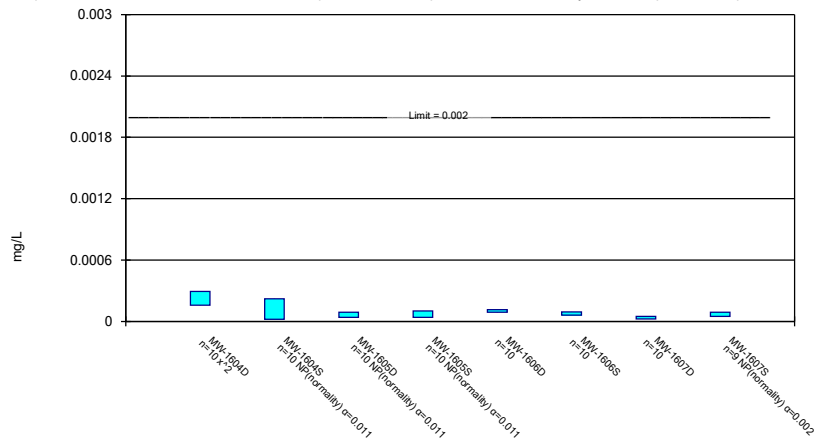
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Thallium, total Analysis Run 12/3/2018 6:56 AM View: Confidence Intervals - App IV
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP