

November 24, 2025

Mr. Brad Davison, Environmental Specialist
IDNR – Land Quality Bureau
6200 Park Avenue, Suite 200
Des Moines, Iowa 50321



**RE: JACKSON COUNTY SANITARY LANDFILL
2025 ANNUAL WATER QUALITY REPORT & LANDFILL GAS REPORT
CLOSURE PERMIT #49-SDP-1-74C**

Dear Mr. Davison:

This letter forwards the results of water quality testing at the Jackson County Sanitary Landfill that was performed in accordance with Permit Amendment #15, dated January 8, 2018 (Doc #91229).

Hydrologic Monitoring System Plan (HMSP)

- 1) On April 3, 2025 and on October 14, 2025 the required wells (Figure 1) were sampled. Samples collected at MW-11, MW-12, MW-17, MW-19, and MW-20 are required to be analyzed for parameters listed in Appendix I, IAC 567, Chapter 113. Samples collected at MW-10, MW-13, MW-14, and MW-15 are required to be analyzed for the metal parameters listed in Appendix I, IAC 567, Chapter 113. Note that MW-19 and MW-20 were both recorded as dry on April 3, 2025 and on October 14, 2025.
- 2) Water Elevation Measurements were collected at each well at the time of sample collection.
- 3) Explosive Gas was monitored in gas probes GP-1 through GP-6 (Figure 1) semi-annually and/or quarterly in accordance with Permit Amendment #14 (Doc #88195) and/or Permit Amendment #17 (Doc #110053). The on-site structure was monitored semi-annually in accordance with Permit Amendment #16 (Doc #92771).
- 4) The results of the 2025 HMSP activities are reported herein and this letter represents the 2025 Annual Water Quality Report/2025 Landfill Gas Report. The statistical analyses (VOC trend analyses and VOC confidence interval evaluations) required by the IDNR Letter dated January 8, 2018 (Doc #91230) are included in the information presented below. The statistical analyses (metals trend analyses and intrawell statistical evaluations) required by the IDNR Letter dated January 13, 2020 (Doc #96730) are included in the information presented below. This site is regulated under the rules in effect at the time of closure (August 29, 1994) and the Closure Permit.

Results of the HMSP Activities

Water Quality - Summary tables of all analytical data collected to date since October 5, 2015 along with the 2025 Analytical Reports are included in **Attachment A**. Field Sampling Forms for April 3, 2025 and on October 14, 2025 sample collection events are included in **Attachment B**. The Statistical Evaluation Reports (June 2025 and October 2025) are included in **Attachment C**.

Review of the data in Attachment A indicates that MW-19 and MW-20 were dry during both sample collection events in 2025. A total of two (2) different verified VOC compounds were detected at this site based on the three (3) wells sampled for VOC in 2025.

Note that in October, 2025, very low concentrations of carbon disulfide were reported by the laboratory. The unusual detections are attributed to field or laboratory contamination, rather than the site groundwater. The carbon disulfide is dismissed from further reporting in 2025. In the event that carbon disulfide is reported again in the future, reporting of the carbon disulfide will then be initiated.

Review of the data in Attachment A indicates that a total of eight (8) different metal compounds were detected at this site based on the seven (7) (of nine (9)) wells sampled for metals in 2025. Note that MW-19 and that MW-20 were recorded as dry on April 3, 2025 and on October 14, 2025.

VOC Trend Analyses and VOC Confidence Interval Evaluation – Review of the Summary of Appendix I Detections indicates that low-level VOC concentrations have been reported at well MW-11, MW-12, and MW-17 in 2025. Although dry, it is assumed that VOC will persist at MW-19 and MW-20 until testing confirms otherwise. With a few exceptions, the reported VOC concentrations have been below the Statewide Standard for Protected Groundwater included in IAC 567, Chapter 137, the groundwater protection standard (GWPS). The historic VOC exceedances of the GWPS are highlighted in yellow on the Summary Table in **Attachment A** and are restricted to MW-12 and MW-19. There were no recorded VOC concentrations that exceeded a GWPS in 2025 (note that MW-19 and MW-20 were recorded as dry). All reported VOC concentrations are also below the Statewide Standard for *Non-Protected* Groundwater included in IAC 567, Chapter 137.

The Statistical Evaluation Reports (June, 2025 and October, 2025) are included in **Attachment C** and satisfy the statistical evaluations of the VOC data required by the IDNR Letter dated January 8, 2018 (Doc #91230).

The tables presented in **Attachment D** include a comprehensive summary of all VOC results detected to date at the facility since no-purge sample collection was implemented. The tables are presented by monitoring well (MW-11, MW-12, MW-17, MW-19, and MW-20) and include a summary of VOC results for any compound that has been detected in the given well. The detected values that exceed the Prediction Limit (the MRL) are highlighted in brown. The detected values that exceed the Statewide Standard for Protected Groundwater included in IAC 567, Chapter 137 are highlighted in yellow.

There are no increasing VOC trends detected in the data. The Upper and Lower Confidence Limits (95%) are summarized in **Attachment D** for the VOC compounds and indicate that all of the calculated 95% LCL values are below the GWPS. The Confidence Limits values are included on *Table 1 in Attachment C* to the Statistical Reports included in **Attachment C of this Report**. The time series plots for all VOC are also included in the graphs in the Confidence Limits (Assessment) plots in *Attachment C* to the Statistical Report included in **Attachment C** of this report.

There are no Statistically Significant Levels (SSL) reported for VOC at the site.

Metals Trend Analyses and Evaluation Methods– The development of the HMSP for this site predates current rule. Sampling for Appendix I analytes was required by IDNR in Permit #11, dated March 17, 2015 (Doc #82748). The analyte list was later reduced to Appendix I metals at certain wells, while full Appendix I sampling continues at the remaining wells (Permit Amendment #14, dated January 24, 2017 (Doc #88195)).

The original HMSP included a single deep bedrock well (MW-10) as the only background well for the site. The interwell statistics performed to date for the VOC compounds is considered appropriate, since the “background” for VOC compounds and the Prediction Limits are based on the laboratory practical quantitation limits (PQL), and is not dependent upon developing appropriate background from representative waters at the site.

With regard to the inorganic compounds, developing interwell prediction limits for the site based on background from a single well completed in one (1) of the two (2) site stratigraphic intervals monitored is highly discouraged. In lieu of performing interwell statistics for the site, intrawell statistical evaluations have been completed utilizing control chart methods. The intrawell statistical evaluations are deemed appropriate for this site where the background is not appropriately characterized in both monitored formations, where only one (1) background well exists, and spatial variability cannot be accounted for.

The intrawell Sherhart-CUSUM control charts are developed for each inorganic compound in each site monitoring well. The control charts are sensitive to both sudden and gradual releases. The control charts evaluate both constituent concentrations and cumulative increases.

Control chart evaluation requires a detection frequency of 25%, or greater, to properly define data variance. A minimum of eight (8) data points are required to develop limits. For constituents that are not detected at a frequency of 25% of tests, the 99% confidence nonparametric prediction limit can be developed after thirteen (13) data points are collected. For constituents that are never detected, the practical quantitation limit (PQL) becomes the nonparametric prediction limit (as is the case with all VOC compounds). The background currently includes thirteen data points at all wells, except MW-19 (12 data points).

Specific to this site, arsenic, barium, and cobalt are the specific compounds that have been detected in site monitoring wells at concentrations that have exceeded the GWPS. At this site, arsenic, barium, cobalt, nickel, and zinc are the compounds that are generally detected at frequencies greater than 25% of the tests in a specific well.

It follows that the control chart method of intrawell statistical evaluation is appropriate to address concerns at this site.

Metals Trend Analyses and Evaluation Findings - A summary of metal testing results is included in **Attachment A** of this document where all detected concentrations that exceed the GWPS are highlighted in yellow and blue. The following is a summary of detected concentrations of arsenic, barium, cadmium, and cobalt that have exceeded the *Protected* Groundwater Standard included in IAC 567, Chapter 137:

MW-10 (upgradient) - 10/5/15 - cadmium (0.0063 mg/L), exceeds the GWPS of 0.005 mg/L (*anomaly*)

MW-12 - 4/3/17 - cobalt (0.0137 mg/L), exceeds the GWPS of 0.0028 mg/L
10/3/17 - cobalt (0.0073 mg/L), exceeds the GWPS of 0.0028 mg/L
4/7/20 - cobalt (0.0026 mg/L), exceeds the GWPS of 0.0021 mg/L
10/7/20 - cobalt (0.0024 mg/L), exceeds the GWPS of 0.0021 mg/L
4/16/21 - cobalt (0.0023 mg/L), exceeds the GWPS of 0.0021 mg/L
10/4/22 - cobalt (0.0029 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-13 - 10/5/15 - arsenic (0.0223 mg/L), exceeds the GWPS of 0.01 mg/L
4/4/16 - arsenic (0.0166 mg/L), exceeds the GWPS of 0.01 mg/L
10/4/16 - arsenic (0.0148 mg/L), exceeds the GWPS of 0.01 mg/L
4/3/17 - arsenic (0.0116 mg/L), exceeds the GWPS of 0.01 mg/L
10/3/17 - arsenic (0.0152 mg/L), exceeds the GWPS of 0.01 mg/L
4/10/18 - arsenic (0.0203 mg/L), exceeds the GWPS of 0.01 mg/L
10/12/18 - arsenic (0.0160 mg/L), exceeds the GWPS of 0.01 mg/L
4/17/19 - arsenic (0.0187 mg/L), exceeds the GWPS of 0.01 mg/L
9/30/19 - arsenic (0.0215 mg/L), exceeds the GWPS of 0.01 mg/L
4/7/20 - arsenic (0.0313 mg/L), exceeds the GWPS of 0.01 mg/L
10/7/20 - arsenic (0.0271 mg/L), exceeds the GWPS of 0.01 mg/L
4/16/21 - arsenic (0.0174 mg/L), exceeds the GWPS of 0.01 mg/L
10/14/21 - arsenic (0.0338 mg/L), exceeds the GWPS of 0.01 mg/L
4/4/22 - arsenic (0.0256 mg/L), exceeds the GWPS of 0.01 mg/L
10/4/22 - arsenic (0.0188 mg/L), exceeds the GWPS of 0.01 mg/L
4/13/23 - arsenic (0.0103 mg/L), exceeds the GWPS of 0.01 mg/L
10/18/23 - arsenic (0.0157 mg/L), exceeds the GWPS of 0.01 mg/L
10/14/25 - arsenic (0.0102 mg/L), exceeds the GWPS of 0.01 mg/L

10/3/17 - barium (3.36 mg/L), exceeds the GWPS of 2.0 mg/L
4/10/18 - barium (2.50 mg/L), exceeds the GWPS of 2.0 mg/L
10/12/18 - barium (2.43 mg/L), exceeds the GWPS of 2.0 mg/L
4/17/19 - barium (4.22 mg/L), exceeds the GWPS of 2.0 mg/L
9/30/19 - barium (3.20 mg/L), exceeds the GWPS of 2.0 mg/L
4/7/20 - barium (3.18 mg/L), exceeds the GWPS of 2.0 mg/L
10/7/20 - barium (3.80 mg/L), exceeds the GWPS of 2.0 mg/L
4/16/21 - barium (2.94 mg/L), exceeds the GWPS of 2.0 mg/L
10/14/21 - barium (3.31 mg/L), exceeds the GWPS of 2.0 mg/L

10/5/15 - cobalt (0.0172 mg/L), exceeds the GWPS of 0.0028 mg/L
4/4/16 - cobalt (0.0131 mg/L), exceeds the GWPS of 0.0028 mg/L
10/4/16 - cobalt (0.0084 mg/L), exceeds the GWPS of 0.0028 mg/L
4/3/17 - cobalt (0.0069 mg/L), exceeds the GWPS of 0.0028 mg/L
10/3/17 - cobalt (0.0092 mg/L), exceeds the GWPS of 0.0028 mg/L
4/10/18 - cobalt (0.0134 mg/L), exceeds the GWPS of 0.0021 mg/L
10/12/18 - cobalt (0.0082 mg/L), exceeds the GWPS of 0.0021 mg/L
4/17/19 - cobalt (0.0048 mg/L), exceeds the GWPS of 0.0021 mg/L
9/30/19 - cobalt (0.0043 mg/L), exceeds the GWPS of 0.0021 mg/L
4/7/20 - cobalt (0.0079 mg/L), exceeds the GWPS of 0.0021 mg/L
10/7/20 - cobalt (0.0105 mg/L), exceeds the GWPS of 0.0021 mg/L
4/16/21 - cobalt (0.0044 mg/L), exceeds the GWPS of 0.0021 mg/L
10/14/21 - cobalt (0.0174 mg/L), exceeds the GWPS of 0.0021 mg/L
4/4/22 - cobalt (0.0161 mg/L), exceeds the GWPS of 0.0021 mg/L
10/4/22 - cobalt (0.0115 mg/L), exceeds the GWPS of 0.0021 mg/L
4/13/23 - cobalt (0.0063 mg/L), exceeds the GWPS of 0.0021 mg/L
10/18/23 - cobalt (0.0090 mg/L), exceeds the GWPS of 0.0021 mg/L
4/8/24 - cobalt (0.0064 mg/L), exceeds the GWPS of 0.0021 mg/L
10/8/24 - cobalt (0.0064 mg/L), exceeds the GWPS of 0.0021 mg/L
4/3/25 - cobalt (0.0069 mg/L), exceeds the GWPS of 0.0021 mg/L
10/14/25 - cobalt (0.0082 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-14 -

4/10/18 - arsenic (0.0299 mg/L), exceeds the GWPS of 0.01 mg/L
4/17/19 - arsenic (0.0186 mg/L), exceeds the GWPS of 0.01 mg/L
9/30/19 - arsenic (0.0323 mg/L), exceeds the GWPS of 0.01 mg/L
4/7/20 - arsenic (0.0278 mg/L), exceeds the GWPS of 0.01 mg/L
4/16/21 - arsenic (0.0133 mg/L), exceeds the GWPS of 0.01 mg/L
10/14/21 - arsenic (0.0587 mg/L), exceeds the GWPS of 0.01 mg/L
4/4/22 - arsenic (0.1390 mg/L), exceeds the GWPS of 0.01 mg/L
10/4/22 - arsenic (0.0125 mg/L), exceeds the GWPS of 0.01 mg/L

4/4/22 - barium (2.36 mg/L), exceeds the GWPS of 2.0 mg/L

10/3/17 - cobalt (0.0036 mg/L), exceeds the GWPS of 0.0028 mg/L
10/4/22 - cobalt (0.0024 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-15 -

4/3/17 - arsenic (0.0131 mg/L), exceeds the GWPS of 0.01 mg/L
10/3/17 - arsenic (0.0164 mg/L), exceeds the GWPS of 0.01 mg/L
4/17/19 - arsenic (0.0139 mg/L), exceeds the GWPS of 0.01 mg/L
4/7/20 - arsenic (0.0301 mg/L), exceeds the GWPS of 0.01 mg/L
10/14/21 - arsenic (0.0124 mg/L), exceeds the GWPS of 0.01 mg/L
10/4/22 - arsenic (0.0111 mg/L), exceeds the GWPS of 0.01 mg/L
10/18/23 - arsenic (0.0130 mg/L), exceeds the GWPS of 0.01 mg/L

10/5/15 - cobalt (0.0061 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/4/16 - cobalt (0.0112 mg/L), exceeds the GWPS of 0.0028 mg/L
 10/4/16 - cobalt (0.0086 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/3/17 - cobalt (0.0144 mg/L), exceeds the GWPS of 0.0028 mg/L
 10/3/17 - cobalt (0.0046 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/10/18 - cobalt (0.0031 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/12/18 - cobalt (0.0027 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/17/19 - cobalt (0.0097 mg/L), exceeds the GWPS of 0.0021 mg/L
 9/30/19 - cobalt (0.0048 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/7/20 - cobalt (0.0111 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/7/20 - cobalt (0.0044 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/16/21 - cobalt (0.0101 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/21 - cobalt (0.0044 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/4/22 - cobalt (0.0079 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/4/22 - cobalt (0.0066 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/13/23 - cobalt (0.0053 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/18/23 - cobalt (0.0051 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/8/2024 - cobalt (0.0022 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/8/24 - cobalt (0.0079 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/3/25 - cobalt (0.0118 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/25 - cobalt (0.0078 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-17 -

10/3/17 - cobalt (0.0107 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/10/18 - cobalt (0.0095 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/17/19 - cobalt (0.0038 mg/L), exceeds the GWPS of 0.0021 mg/L
 9/30/19 - cobalt (0.0093 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/7/20 - cobalt (0.0079 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/21 - cobalt (0.0090 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/8/2024 - cobalt (0.0054 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/3/25 - cobalt (0.0073 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/25 - cobalt (0.0146 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-19 -

10/3/17 - arsenic (0.0109 mg/L), exceeds the GWPS of 0.01 mg/L
 4/10/18 - arsenic (0.0119 mg/L), exceeds the GWPS of 0.01 mg/L
 10/4/16 - cobalt (0.0043 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/3/17 - cobalt (0.0040 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/10/18 - cobalt (0.0039 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/12/18 - cobalt (0.0025 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/17/19 - cobalt (0.0032 mg/L), exceeds the GWPS of 0.0021 mg/L
 9/30/19 - cobalt (0.0035 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/7/20 - cobalt (0.0023 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/16/21 - cobalt (0.0025 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/21 - cobalt (0.0024 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/4/22 - cobalt (0.0042 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/4/22 - cobalt (0.0052 mg/L), exceeds the GWPS of 0.0021 mg/L

MW-20 -

10/4/16 - barium (3.01 mg/L), exceeds the GWPS of 2.0 mg/L
 4/3/17 - barium (3.66 mg/L), exceeds the GWPS of 2.0 mg/L
 10/3/17 - barium (4.3 mg/L), exceeds the GWPS of 2.0 mg/L
 4/10/18 - barium (3.41 mg/L), exceeds the GWPS of 2.0 mg/L
 10/12/18 - barium (4.13 mg/L), exceeds the GWPS of 2.0 mg/L

4/17/19 - barium (4.54 mg/L), exceeds the GWPS of 2.0 mg/L
 9/30/19 - barium (5.30 mg/L), exceeds the GWPS of 2.0 mg/L
 4/7/20 - barium (4.99 mg/L), exceeds the GWPS of 2.0 mg/L
 10/7/20 - barium (5.05 mg/L), exceeds the GWPS of 2.0 mg/L
 4/16/21 - barium (4.37 mg/L), exceeds the GWPS of 2.0 mg/L
 10/14/21 - barium (4.43 mg/L), exceeds the GWPS of 2.0 mg/L

10/4/16 - cobalt (0.0066 mg/L), exceeds the GWPS of 0.0028 mg/L
 4/10/18 - cobalt (0.0033 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/12/18 - cobalt (0.0027 mg/L), exceeds the GWPS of 0.0021 mg/L
 4/17/19 - cobalt (0.0025 mg/L), exceeds the GWPS of 0.0021 mg/L
 9/30/19 - cobalt (0.0024 mg/L), exceeds the GWPS of 0.0021 mg/L
 10/14/21 - cobalt (0.0022 mg/L), exceeds the GWPS of 0.0021 mg/L

The Statewide Standard for Non-Protected Groundwater included in IAC 567, Chapter 137 are as follows:

Arsenic	0.05 mg/L
Barium	10.0 mg/L
Cobalt	0.01 mg/L

To date, barium has not been detected at concentrations that exceed the Non-Protected Groundwater standard. Arsenic and cobalt concentrations are detected in excess of the Non-Protected Groundwater standard during random events as follows (values are also highlighted in blue in **Attachment A**):

MW-12 -	4/3/17 - cobalt (0.0137 mg/L)*, exceeds the GWPS of 0.01 mg/L <i>* determined to be an outlier by Dixon's test</i>
MW-13 -	10/5/15 - cobalt (0.0172 mg/L), exceeds the GWPS of 0.01 mg/L 4/4/16 - cobalt (0.0131 mg/L), exceeds the GWPS of 0.01 mg/L 4/10/18 - cobalt (0.0134 mg/L), exceeds the GWPS of 0.01 mg/L 9/7/20 - cobalt (0.0105 mg/L), exceeds the GWPS of 0.01 mg/L 10/14/21 - cobalt (0.0174 mg/L), exceeds the GWPS of 0.01 mg/L 4/4/22 - cobalt (0.0161 mg/L), exceeds the GWPS of 0.01 mg/L 10/4/22 - cobalt (0.0115 mg/L), exceeds the GWPS of 0.01 mg/L
MW-14 -	10/14/21 - arsenic (0.0587 mg/L), exceeds the GWPS of 0.05 mg/L 4/4/22 - arsenic (0.1390 mg/L), exceeds the GWPS of 0.05 mg/L
MW-15 -	4/4/16 - cobalt (0.0112 mg/L), exceeds the GWPS of 0.01 mg/L 4/3/17 - cobalt (0.0144 mg/L), exceeds the GWPS of 0.01 mg/L 4/7/20 - cobalt (0.0111 mg/L), exceeds the GWPS of 0.01 mg/L 4/16/21 - cobalt (0.0101 mg/L), exceeds the GWPS of 0.01 mg/L
MW-17 -	10/3/17 - cobalt (0.0107 mg/L), exceeds the GWPS of 0.01 mg/L 10/14/25 - cobalt (0.0146 mg/L), exceeds the GWPS of 0.01 mg/L

The time series plots for metals are included in Attachment D, Times Series Plots of Trace Metals in the Statistical Reports (in **Attachment C of this document**). An upward trend was detected for arsenic at MW-13 and for barium at MW-14 in the historic background data (the first 13 data points). The time series plots indicate that the metals concentrations are static (not increasing trends) at all other wells across the site.

The intrawell statistics developed for the metals compounds are included in Attachment E, Statistics for Trace Metals in the Statistical Reports (in **Attachment C of this document**). In the Fall 2025 Statistical

Evaluation the control limits were established based on the initial thirteen (13) rounds of data available. MW-19 and MW-20 were recorded as dry in both April, 2025 and October, 2025 and are not evaluated herein.

The control limits developed at each well based on the background events in each well are used on the control charts in Attachment E, Statistics for Trace Metals in the Statistical Reports (in **Attachment C of this document**). The Fall 2025 Control Charts are relied upon herein based on the most current data for each well (13 background events and 5 monitoring event). Many compounds have nonparametric limits established based on a frequency of detection below 25%.

Review of the Control Charts indicates that there were control limit exceedances for copper and zinc at MW-12 in October, 2025, There were no control limit exceedances identified at any other wells in 2025.

There were no increasing trends identified in metals data based on the time series plots or the Control Charts in the Fall, 2025 (October, 2025) Statistical Evaluation, except the aforementioned increasing trend identified for arsenic at MW-13 and for barium at MW-14. The detected concentrations of metals appear to be consistent over time. It is concluded that the metals concentrations detected across the site are relatively static, generally do not exceed Control Chart limits, and do not appear to be trending. It appears that water quality has been stable over time.

Compilation of additional data over time (semi-annual samples over the next several years) will yield additional monitoring data to support conclusions related to water quality trends for metals.

Supplemental water quality testing and supplemental assessment of the subsurface conditions were performed at the site on October 14, 2021. The supplemental testing and study was performed in order to identify the outside factors that result in elevated metals concentrations at some wells on site. The supplemental study was submitted to IDNR on November 29, 2021 (Doc #101767) and IDNR agreed with the conclusions on November 28, 2022 (Doc #104673).

Monitoring Well Maintenance Performance Reevaluation - The table below outlines the status of well performance and maintenance activities as required by IAC 567-103.

Years	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Annual water-quality report	X	X	X	X	X	X	X	X	X	X	X
High and low water levels		X		X		X		X		X	
Six-month water levels	X	X	X	X	X	X	X	X	X	X	X
Well-depth measurements	X	X	X	X	X	X	X	X	X	X	X
In-situ hydraulic conductivity							X				

Years	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual water-quality report	X	X	X	X	X	X	X	X	X	X	O
High and low water levels		X		X	X	X	X	X	X	X	O
Six-month water levels	X	X	X	X	X	X	X	X	X	X	O
Well-depth measurements	X	X	X	X	X	X	X	X	X	X	O
In-situ hydraulic conductivity	X						X				

X, completed; O, scheduled.

High & Low Water Levels

Water elevation data is included in the attached Table (**Attachment E**). It appears that variation is recorded in the water table elevations in 2025 and the variations are observed seasonally. MW-14, MW-15, and MW-21 generally demonstrate the greatest variation.

A Water Table and Bedrock Water Surface Contour Maps dated October 14, 2025, are included with this report as Figures 2 and 3.

Well Depth & Sedimentation

Well depth measurements were made on October 14, 2025. Review of the measurement data included on the field measurement forms in **Attachment B** indicates that well sedimentation is estimated to be less than 1.0 feet at all site monitoring wells, except MW-11, where 1.57 feet of sedimentation is recorded in the 10.0 ft screen section.

Hydraulic Conductivity Rates

Hydraulic Conductivity values have been measured at site monitoring wells in 1991, 1994, 1999, 2004, 2011, 2016, and 2022. The most recent Monitoring Well Maintenance Performance Evaluation Report is dated April 18, 2022 (Doc #102862) and was submitted in accordance with 1992 IAC 110.9. The 2022 report concluded that the integrity of all MW's was intact, and that no changes in the HMSP were recommended. Monitoring well reevaluation is tentatively scheduled again in 2027.

Based on the water elevation data, the current well conditions, and the hydrologic setting at the site, the semi-annual water elevation measurements at the closed facility are interpreted to be adequate to monitor site conditions.

Quality Assurance/Quality Control - A blind duplicate sample was collected at MW-13 during the April 3, 2025 sampling episode. A blind duplicate sample was also collected at MW-14 during the October 14, 2025 sampling episode.

The purpose of the field duplicate is to evaluate the precision of sample collection and analysis process from the field through the laboratory. The calculation of the Relative Percent Difference (RPD) for duplicate pair results is used as the means to evaluate the precision.

The Quality Control (QC) limit for the RPD on field duplicates is established at thirty percent (30%) for duplicate pairs that have reported concentrations five (5) times greater than the laboratory Reporting Limit. For samples and respective duplicates with reported analyte concentrations nearer the Reporting Limit, the RPD calculations demonstrate greater variability and the RPD can be very large. RPD values are considered non-representative in the following conditions:

- a) Both the original and/or the duplicate results are less than five (5) times the Reporting Limit.
- b) One or both results are qualified, flagged, or estimated.
- c) One or both results are non-detected.

The results of the blind duplicate and the monitoring well results were within the limits established and indicate that the data quality is acceptable without restriction.

Water Elevation Measurements - Water elevation measurements were collected at each well during sampling on April 3, 2025 and October 14, 2025 and are included in the Table in **Attachment E**. Review of the water elevation data for 2025 does not indicate excessive variability compared to historic water elevation data. The variability in water levels appears to be cyclic over time. A copy of the October 14, 2025 Water Table Contour Map (Figure 2) and the October 14, 2025 Bedrock Potentiometric Map (Figure 3) are included herein and illustrates groundwater flow paths across the site.

Explosive Gas Monitoring – The semi-annual explosive gas monitoring (in the site structure and at subsurface gas probes) was performed in accordance Permit Amendment #14 (Doc #88195) and Permit Amendment #16 (Doc #92771). The quarterly gas monitoring at GP-3 and the incorporation of water level measurements in gas probes was initiated in July of 2024 in accordance with Permit Amendment #17 (Doc #110053).

Gas Monitoring results are included in the Tables in **Attachment F**.

The results of the monitoring indicate that gas concentrations were undetected during all monitoring episodes in 2025, with the exception of GP-4 (east side). Explosive gas was detected at 31.8% LEL in GP-4 on April 3, 2025. All detected concentrations were recorded below actionable levels.

A gas extraction system exists along the east side of the site. The east side system was installed to further lower the landfill gas concentrations along the east side of the site (monitored by GP-4). The gas extraction system operates on a timer and the system was not operating on April 3, 2025. The system was repaired on April 16, 2025, following discovery of an electrical breaker issue. Gas was not detected in GP-4 on October 14, 2025.

Review of the water elevation data in gas probes indicates that all probes had sufficient screen open to the vadose zone at the site in 2025.

The quarterly gas monitoring at GP-3 and GP-6 required by Permit Amendment #17 (Doc 110053) will continue until the second quarter of 2026 to establish any trends as required by the IDNR Letter dated January 21, 2025 (Doc #111914). Based on the absence of detections at GP-3 and GP-6 during 2025, it appears that the monitoring frequency at GP-3 and GP-6 can be reduced again to a semi-annual frequency now that a remedy is constructed and documented to be actively venting gas.

The passive gas vent trench required by Permit Amendment #17 (Doc 110053) was completed in September 2024 and construction documentation was submitted to IDNR on November 1, 2024 (Doc #111235). The east-end riser pipe (Trench (E)) and the west-end riser pipe (Trench (W)) are monitored semi-annually and are summarized in the Table in **Attachment G**.

On July 25, 2024, ten (10) passive vents were drilled in the southwest corner of the landfill footprint (Figure 1). The vents were installed in an effort to improve the cap vegetation in this portion of the closed landfill. Each of the vents (designated Vent 1 through Vent 10) are monitored semi-annually to document the general performance of the passive venting. Monitoring results are summarized in the Table in **Attachment G**.

The results of monitoring performed at the vent trench riser pipes and at the ten (10) passive vents, indicate that venting of gas is occurring.

Recommendations

It is recommended that the HMSP and GMSP activities performed in 2026 again be in accordance with the scope and frequencies required in Permit Amendments #14, #15, #16, and #17.

It is recommended that the frequency of gas monitoring at GP-3 and GP-6 be reduced to a semi-annual frequency after the second quarter of 2026 to correspond to the monitoring frequency at all other monitoring points at the site.

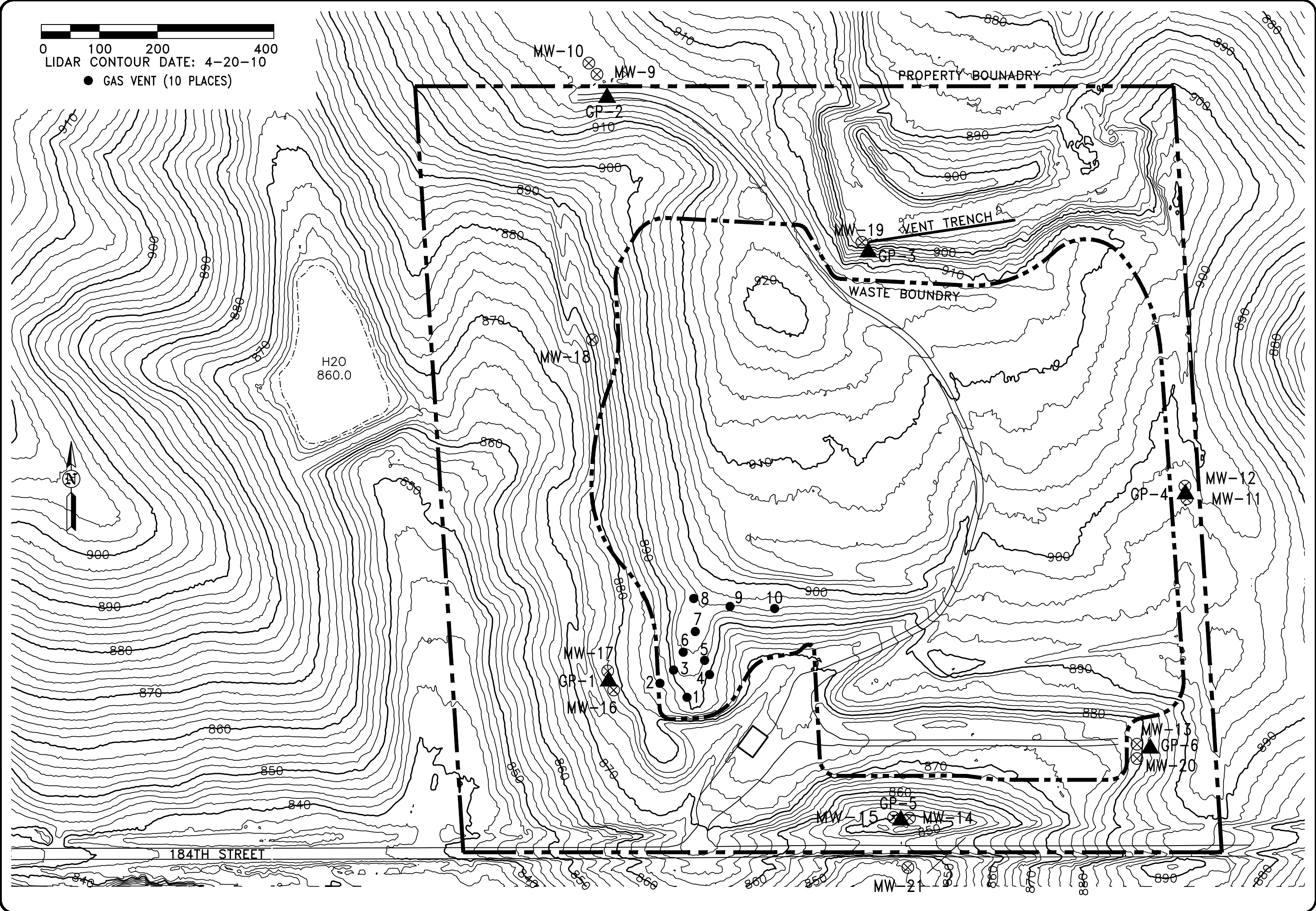
It is recommended that the gas extraction system along the east side of the site continue to be operated and maintained.

It is recommended that the riser pipes of the Trench near GP-3 and at the ten (10) passive vents in the southwest portion of the site continue to be monitored semi-annually and reported annually.

Please feel free to contact our office at (515) 733-4144 with any questions you may have.



cc: Frank Frieberg, Director, Waste Authority of Jackson County





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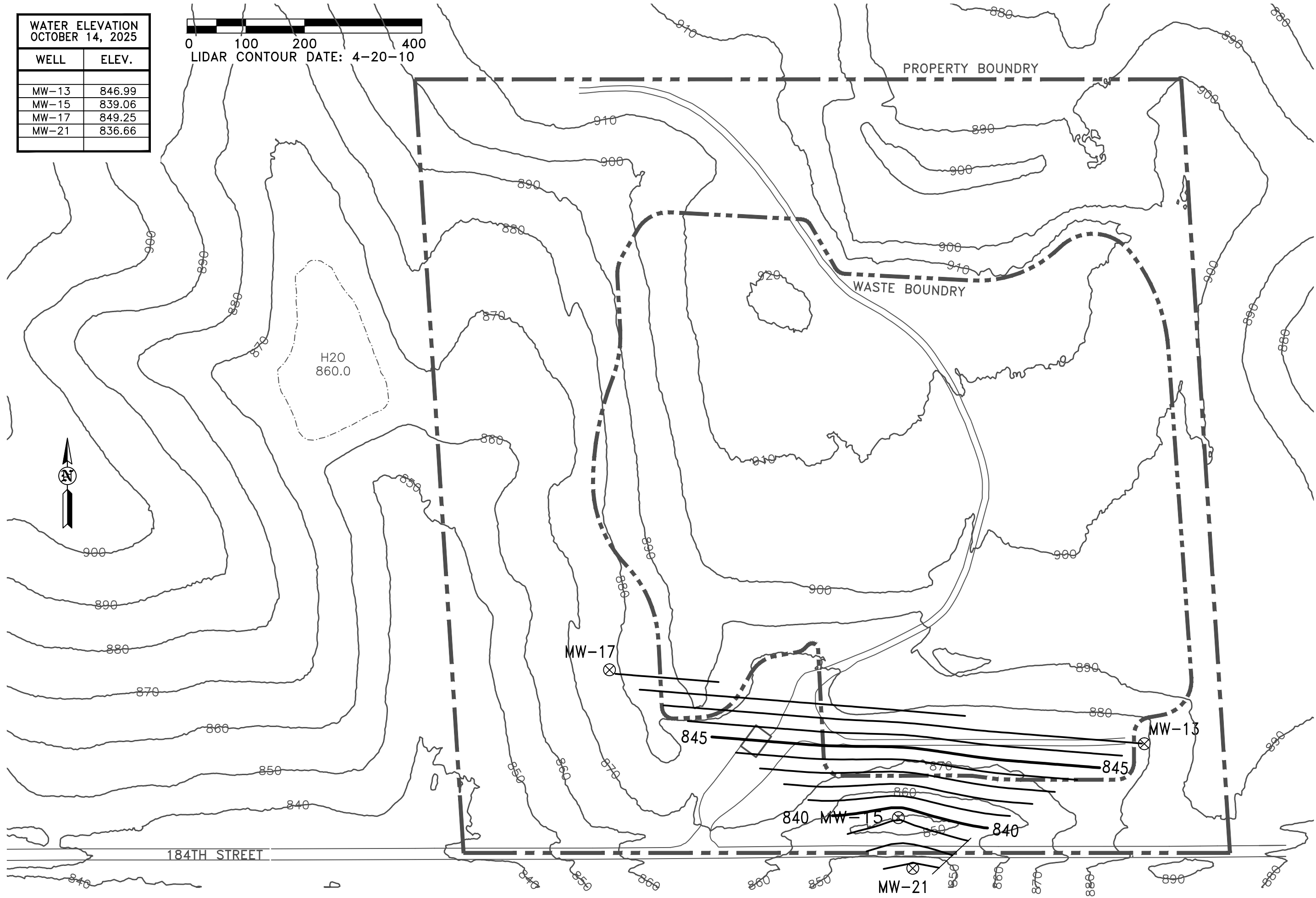
**SITE PLAN AND
GAS PROBE LOCATION MAP**
JACKSON COUNTY SANITARY LANDFILL
MAQUOKETA, IOWA

FIGURE: 1

REVISION	NO.	DATE
DRAWN	6040	DATE
DRA		10-20-25

WATER ELEVATION OCTOBER 14, 2025	
WELL	ELEV.
MW-13	846.99
MW-15	839.06
MW-17	849.25
MW-21	836.66

0 100 200 400
LIDAR CONTOUR DATE: 4-20-10





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WATER TABLE CONTOUR MAP

JACKSON COUNTY SANITARY LANDFILL

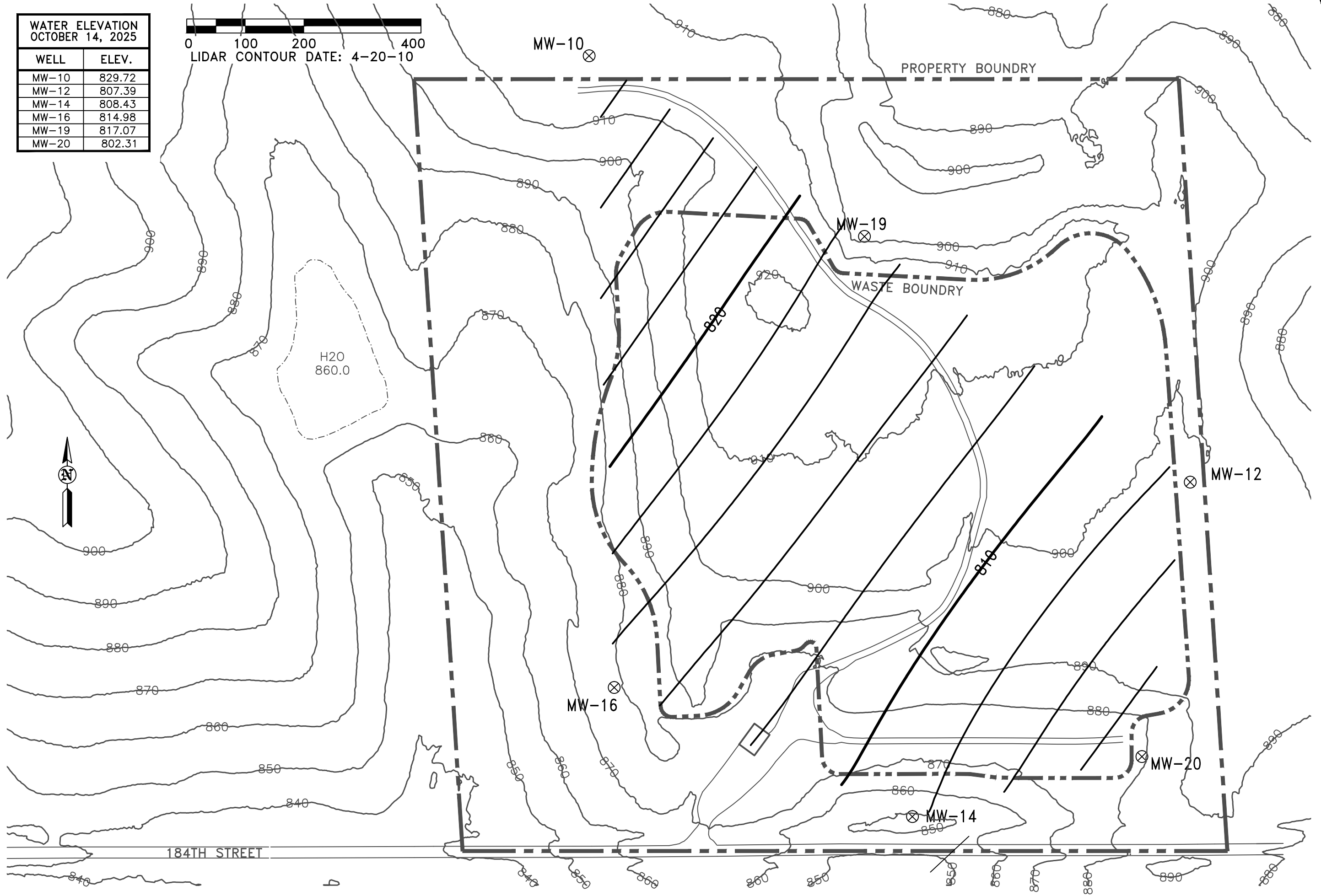
MAQUOKETA, IOWA

FIGURE: 2

REVISION	NO.	DATE
DRAWN	PROJECT NO.	DATE
DRA	6040	10-20-25

WATER ELEVATION OCTOBER 14, 2025	
WELL	ELEV.
MW-10	829.72
MW-12	807.39
MW-14	808.43
MW-16	814.98
MW-19	817.07
MW-20	802.31

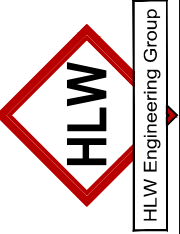
0 100 200 400
LIDAR CONTOUR DATE: 4-20-10



REVISION		NO.	DATE
DRAWN	DRA	6040	10-20-25

FIGURE: 3
BEDROCK POTENTIOMETRIC SURFACE MAP
JACKSON COUNTY SANITARY LANDFILL
MAQUOKETA, IOWA

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ATTACHMENT A

Water Quality Results & Summary

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Turbidity (metal sample)	N/A	NTU	0.82	NT	3.27	32.64	11.95	3.58	34.24	5.93	Dry	Dry
4/4/2016	Turbidity (metal sample)	N/A	NTU	3.53	58.07	1.43	4.26	5.46	1.36	82.65	0.17	Dry	Dry
10/4/2016	Turbidity (metal sample)	N/A	NTU	4.07	31.45	1.86	7.45	33.94	2.86	5.13	1.15	2.64	9.23
4/3/2017	Turbidity (metal sample)	N/A	NTU	1.28	11.03	12.06	6.48	25.29	4.65	NT	1.82	3.1	11.45
10/3/2017	Turbidity (metal sample)	N/A	NTU	1.05	0.38	1.17	1.2	79.78	0.28	NT	0.3	3.72	10.27
4/10/2018	Turbidity (metal sample)	N/A	NTU	0.53	0.064	0.6	3.51	53.63	3.35	NT	0.56	3.44	17.69
10/12/2018	Turbidity (metal sample)	N/A	NTU	1.09	5.11	0.7	17.54	3.38	4.42	NT	7.74	2.38	26.98
4/17/2019	Turbidity (metal sample)	N/A	NTU	1.17	4.27	0.72	2.15	172.1	3.12	NT	1.33	3.01	5.93
9/30/2019	Turbidity (metal sample)	N/A	NTU	1.14	1.3	2.34	1.13	32.46	2.06	NT	0.89	1.75	8.42
4/7/2020	Turbidity (metal sample)	N/A	NTU	2.58	3.46	0.73	6.01	32.88	202.7	NT	1.07	2.39	6.34
10/7/2020	Turbidity (metal sample)	N/A	NTU	3.60	1.30	1.61	33.73	61.18	33.38	NT	1.67	2.89	6.36
4/16/2021	Turbidity (metal sample)	N/A	NTU	2.54	1.73	2.06	1.98	23.54	39.6	NT	8.39	2.16	4.06
10/14/2021	Turbidity (metal sample)	N/A	NTU	1.76	4.00	1.79	80.51	214.5	5.04	NT	5.54	3.1	11.99
4/4/2022	Turbidity (metal sample)	N/A	NTU	1.70	3.45	19.73	1.31	10.82	179.4	NT	0.64	38.85	Dry
10/4/2022	Turbidity (metal sample)	N/A	NTU	7.18	2.38	2	7.51	15.98	39.41	NT	1.06	15.21	Dry
4/13/2023	Turbidity (metal sample)	N/A	NTU	2.72	2.97	1.33	1.65	12.34	14.84	NT	1.07	8.92	Dry
10/18/2023	Turbidity (metal sample)	N/A	NTU	1.69	2.25	1.73	15.82	28.29	49.52	NT	1.76	Dry	Dry
4/8/2024	Turbidity (metal sample)	N/A	NTU	3.32	1.88	7.97	3.44	3.6	2.63	NT	2.28	Dry	Dry
10/8/2024	Turbidity (metal sample)	N/A	NTU	2.06	2.29	3.69	2.82	19.33	7.41	NT	2.46	Dry	Dry
4/3/2025	Turbidity (metal sample)	N/A	NTU	2.44	2.32	4.84	4.70	9.87	12.36	NT	3.02	Dry	Dry
10/14/2025	Turbidity (metal sample)	N/A	NTU	0.92	1.65	1.87	3.63	21.8	4.57	NT	1.69	Dry	Dry

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	cloroethane	2,800	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	cloroethane	2,800	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	cloroethane	2,800	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	3.2	<1
4/3/2017	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.4	<1
10/3/2017	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.2	<1
4/10/2018	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.5	<1
10/12/2018	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.7	<1
4/17/2019	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.8	<1
9/30/2019	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.2	<1
4/7/2020	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.6	<1
10/7/2020	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	4.0	<1
4/16/2021	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.1	<1
10/14/2021	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.0	<1
4/4/2022	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/4/2022	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.7	Dry
4/13/2023	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/18/2023	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	cloroethane	2,800	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	acetone	6,300	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	acetone	6,300	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	acetone	6,300	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	19.0	72.9
4/3/2017	acetone	6,300	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	49.6	10.4
10/3/2017	acetone	6,300	ug/L	NT	NT	NT	NT	NT	NT	NT	NT	<10	34.0
4/10/2018	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	32.9
10/12/2018	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	13.0	28.7
4/17/2019	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	27.2
9/30/2019	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	<10
4/7/2020	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	<10
10/7/2020	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	<10
4/16/2021	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	<10
10/14/2021	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	180.0
4/4/2022	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	35.2	Dry
10/4/2022	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	17.0	Dry
4/13/2023	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	<10	Dry
10/18/2023	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	Dry	Dry
4/8/2024	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	Dry	Dry
10/8/2024	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	Dry	Dry
4/3/2025	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	Dry	Dry
10/14/2025	acetone	6,300	ug/L	NT	<10	<10	NT	NT	NT	NT	<10	Dry	Dry

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	1,1-dichloroethane	140	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	1,1-dichloroethane	140	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	1,1-dichloroethane	140	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	3.2	<1
4/3/2017	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	6.3	<1
10/3/2017	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.1	<1
4/10/2018	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.6	<1
10/12/2018	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	4.2	<1
4/17/2019	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	5.2	<1
9/30/2019	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	6.4	<1
4/7/2020	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	5.4	<1
10/7/2020	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	9.3	<1
4/16/2021	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.7	<1
10/14/2021	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.8	<1
4/4/2022	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.3	Dry
10/4/2022	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	2.4	Dry
4/13/2023	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/18/2023	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	1,1-dichloroethane	140	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	cis-1,2-DCE	70	ug/L	<1	NT	1.2	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	cis-1,2-DCE	70	ug/L	<1	<1	1.4	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	cis-1,2-DCE	70	ug/L	<1	<1	1.1	<1	<1	<1	<1	<1	23.4	1.0
4/3/2017	cis-1,2-DCE	70	ug/L	NT	<1	1.8	NT	NT	NT	NT	<1	4.5	1.1
10/3/2017	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	1.0	36.0	<1
4/10/2018	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	46.2	<1
10/12/2018	cis-1,2-DCE	70	ug/L	NT	<1	2.8	NT	NT	NT	NT	3.1	34.7	6.0
4/17/2019	cis-1,2-DCE	70	ug/L	NT	<1	1.0	NT	NT	NT	NT	<1	43.1	3.8
9/30/2019	cis-1,2-DCE	70	ug/L	NT	<1	1.1	NT	NT	NT	NT	1.1	39.9	3.7
4/7/2020	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	54.4	3.4
10/7/2020	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	98.0	9.1
4/16/2021	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	23.4	4.5
10/14/2021	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	26.8	3.9
4/4/2022	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	6.6	Dry
10/4/2022	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	7.6	Dry
4/13/2023	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.8	Dry
10/18/2023	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	cis-1,2-DCE	70	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry

2015-2025 Modified HMSP Sampling & Testing Results
Jackson County Sanitary Landfill
Summary of Appendix I Detections

Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	benzene	5	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	benzene	5	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	benzene	5	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	1.1	<1
4/3/2017	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/3/2017	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/10/2018	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/12/2018	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/17/2019	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.1	<1
9/30/2019	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/7/2020	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.5	<1
10/7/2020	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.1	<1
4/16/2021	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	1.7	<1
10/14/2021	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/4/2022	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/4/2022	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
4/13/2023	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/18/2023	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	benzene	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	TCE	5	ug/L	<1	NT	3.3	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	TCE	5	ug/L	<1	<1	5.0	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	TCE	5	ug/L	<1	<1	3.8	<1	<1	<1	<1	<1	2.8	<1
4/3/2017	TCE	5	ug/L	NT	<1	4.5	NT	NT	NT	NT	<1	7.9	<1
10/3/2017	TCE	5	ug/L	NT	<1	5.6	NT	NT	NT	NT	<1	<1	2.2
4/10/2018	TCE	5	ug/L	NT	<1	4.9	NT	NT	NT	NT	<1	<1	<1
10/12/2018	TCE	5	ug/L	NT	<1	5.1	NT	NT	NT	NT	<1	5.1	1.7
4/17/2019	TCE	5	ug/L	NT	<1	3.9	NT	NT	NT	NT	<1	3.9	3.1
9/30/2019	TCE	5	ug/L	NT	<1	2.4	NT	NT	NT	NT	<1	11.8	<1
4/7/2020	TCE	5	ug/L	NT	<1	3.5	NT	NT	NT	NT	<1	2.2	1.1
10/7/2020	TCE	5	ug/L	NT	<1	2.6	NT	NT	NT	NT	<1	2.0	<1
4/16/2021	TCE	5	ug/L	NT	<1	2.7	NT	NT	NT	NT	<1	10.6	<1
10/14/2021	TCE	5	ug/L	NT	<1	2.2	NT	NT	NT	NT	<1	3.6	<1
4/4/2022	TCE	5	ug/L	NT	<1	2.5	NT	NT	NT	NT	<1	2.1	Dry
10/4/2022	TCE	5	ug/L	NT	<1	3	NT	NT	NT	NT	<1	5.1	Dry
4/13/2023	TCE	5	ug/L	NT	<1	2.2	NT	NT	NT	NT	<1	2.3	Dry
10/18/2023	TCE	5	ug/L	NT	<1	2.1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	TCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	TCE	5	ug/L	NT	<1	2.2	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	TCE	5	ug/L	NT	<1	1.8	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	TCE	5	ug/L	NT	1.1	3.1	NT	NT	NT	NT	<1	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	toluene	1,000	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	toluene	1,000	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	toluene	1,000	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	6.7
4/3/2017	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	1.3
10/3/2017	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/10/2018	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/12/2018	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/17/2019	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
9/30/2019	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/7/2020	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/7/2020	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/16/2021	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/14/2021	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/4/2022	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/4/2022	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
4/13/2023	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
10/18/2023	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/8/2024	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry
10/14/2025	toluene	1,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	PCE	5	ug/L	<1	NT	<1	<1	<1	<1	<1	1.7	Dry	Dry
4/4/2016	PCE	5	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1	Dry	Dry
10/4/2016	PCE	5	ug/L	<1	1.4	<1	<1	<1	<1	<1	1.2	6.6	<1
4/3/2017	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	1.6	43.2	<1
10/3/2017	PCE	5	ug/L	NT	2.3	<1	NT	NT	NT	NT	1.7	<1	1.7
4/10/2018	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/12/2018	PCE	5	ug/L	NT	3.1	<1	NT	NT	NT	NT	2.3	2.8	<1
4/17/2019	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	1.2	1.9	<1
9/30/2019	PCE	5	ug/L	NT	2.0	<1	NT	NT	NT	NT	1.0	<1	<1
4/7/2020	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	1.4	<1	<1
10/7/2020	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/16/2021	PCE	5	ug/L	NT	1.4	<1	NT	NT	NT	NT	1.2	<1	<1
10/14/2021	PCE	5	ug/L	NT	1.4	<1	NT	NT	NT	NT	<1	1.0	<1
4/4/2022	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	1.2	<1	Dry
10/4/2022	PCE	5	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	Dry
4/13/2023	PCE	5	ug/L	NT	2.0	<1	NT	NT	NT	NT	1.2	<1	Dry
10/18/2023	PCE	5	ug/L	NT	1.3	<1	NT	NT	NT	NT	<1	Dry	Dry
4/8/2024	PCE	5	ug/L	NT	<1	1.8	NT	NT	NT	NT	1.2	Dry	Dry
10/8/2024	PCE	5	ug/L	NT	1.1	<1	NT	NT	NT	NT	<1	Dry	Dry
4/3/2025	PCE	5	ug/L	NT	2.0	<1	NT	NT	NT	NT	1.2	Dry	Dry
10/14/2025	PCE	5	ug/L	NT	2.1	<1	NT	NT	NT	NT	1.3	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	xlenes	10,000	ug/L	<1	NT	<1	<1	<1	<1	<1	<1	Dry	Dry
4/4/2016	xlenes	10,000	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry
10/4/2016	xlenes	10,000	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	6.7
4/3/2017	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	1.3
10/3/2017	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/10/2018	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/12/2018	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/17/2019	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
9/30/2019	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
4/7/2020	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	<1	<1
10/7/2020	xlenes	10,000	ug/L	NT	<1	<1	NT	NT	NT	NT	<1	3.0	<1
4/16/2021	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	<2	<2
10/14/2021	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	<2	<2
4/4/2022	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	<2	Dry
10/4/2022	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	<2	Dry
4/13/2023	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	<2	Dry
10/18/2023	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	Dry	Dry
4/8/2024	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	Dry	Dry
10/8/2024	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	Dry	Dry
4/3/2025	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	Dry	Dry
10/14/2025	xlenes	10,000	ug/L	NT	<2	<2	NT	NT	NT	NT	<2	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Arsenic, total	0.01	mg/L	<0.004	NT	<0.004	0.0223	<0.004	<0.004	<0.004	<0.004	Dry	Dry
4/4/2016	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0166	<0.004	<0.004	<0.004	<0.004	Dry	Dry
10/4/2016	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0148	<0.004	<0.004	<0.004	<0.004	0.0062	0.0069
4/3/2017	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0116	<0.004	0.0131	NT	<0.004	0.0066	0.0074
10/3/2017	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0152	<0.004	0.0164	NT	<0.004	0.0109	0.0090
4/10/2018	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0203	0.0299	<0.004	NT	<0.004	0.0119	0.0064
10/12/2018	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0160	<0.004	<0.004	NT	<0.004	0.0058	0.0054
4/17/2019	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0187	0.0186	0.0139	NT	<0.004	0.0064	0.0051
9/30/2019	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0215	0.0323	0.0046	NT	<0.004	0.0080	0.0073
4/7/2020	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0313	0.0278	0.0301	NT	<0.004	0.0061	0.0057
10/7/2020	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0271	0.0080	0.0045	NT	<0.004	0.0059	0.0054
4/16/2021	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0174	0.0133	0.0045	NT	<0.004	0.0045	0.0045
10/14/2021	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0338	0.0587	0.0124	NT	<0.004	0.0044	0.0049
4/4/2022	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0256	0.1390	<0.004	NT	<0.004	<0.004	Dry
10/4/2022	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0188	0.0125	0.0111	NT	<0.004	<0.004	Dry
4/13/2023	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0103	<0.004	<0.004	NT	<0.004	<0.004	Dry
10/18/2023	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0157	0.0077	0.0130	NT	<0.004	Dry	Dry
4/8/2024	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0088	<0.004	<0.004	NT	<0.004	Dry	Dry
10/8/2024	Arsenic, total	0.01	mg/L	<0.004	<0.004	<0.004	0.0095	0.0076	<0.004	NT	<0.004	Dry	Dry
4/3/2025	Arsenic, total	0.01	mg/L	<0.002	<0.002	<0.002	0.0086	0.0075	<0.002	NT	<0.002	Dry	Dry
10/14/2025	Arsenic, total	0.01	mg/L	<0.002	<0.002	<0.002	0.0102	0.0050	<0.002	NT	<0.002	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Barium, total	2	mg/L	0.103	NT	0.208	0.856	0.641	0.284	0.0535	0.179	Dry	Dry
4/4/2016	Barium, total	2	mg/L	0.0989	0.117	0.217	0.482	0.479	0.251	0.0469	0.161	Dry	Dry
10/4/2016	Barium, total	2	mg/L	0.0889	0.0863	0.229	0.986	0.428	0.352	0.0401	0.18	0.946	3.01
4/3/2017	Barium, total	2	mg/L	0.0920	0.103	0.310	1.64	0.609	0.300	NT	0.222	0.880	3.66
10/3/2017	Barium, total	2	mg/L	0.0950	0.0926	0.518	3.36	0.677	0.199	NT	0.379	1.050	4.30
4/10/2018	Barium, total	2	mg/L	0.0929	0.112	0.644	2.50	1.08	0.363	NT	0.447	0.878	3.41
10/12/2018	Barium, total	2	mg/L	0.0889	0.102	0.407	2.43	0.785	0.239	NT	0.201	0.843	4.13
4/17/2019	Barium, total	2	mg/L	0.0968	0.113	0.448	4.22	1.11	0.235	NT	0.239	1.12	4.54
9/30/2019	Barium, total	2	mg/L	0.1040	0.0982	0.584	3.20	1.38	0.298	NT	0.320	1.24	5.30
4/7/2020	Barium, total	2	mg/L	0.0998	0.0969	0.516	3.18	1.23	0.307	NT	0.288	0.940	4.99
10/7/2020	Barium, total	2	mg/L	0.0958	0.0838	0.443	3.80	0.825	0.279	NT	0.220	1.15	5.05
4/16/2021	Barium, total	2	mg/L	0.0848	0.0996	0.422	2.94	0.913	0.305	NT	0.202	1.040	4.37
10/14/2021	Barium, total	2	mg/L	0.0854	0.0916	0.403	3.31	1.44	0.235	NT	0.241	1.05	4.43
4/4/2022	Barium, total	2	mg/L	0.0893	0.0817	0.405	1.80	2.36	0.311	NT	0.182	0.862	Dry
10/4/2022	Barium, total	2	mg/L	0.0945	0.0970	0.407	0.971	1.08	0.327	NT	0.192	1.12	Dry
4/13/2023	Barium, total	2	mg/L	0.0799	0.0967	0.337	0.444	0.765	0.222	NT	0.187	0.550	Dry
10/18/2023	Barium, total	2	mg/L	0.0837	0.0976	0.319	0.752	0.800	0.226	NT	0.193	Dry	Dry
4/8/2024	Barium, total	2	mg/L	0.0868	0.0850	0.353	0.715	0.691	0.356	NT	0.202	Dry	Dry
10/8/2024	Barium, total	2	mg/L	0.0792	0.0859	0.287	0.391	0.740	0.327	NT	0.212	Dry	Dry
4/3/2025	Barium, total	2	mg/L	0.0944	0.1070	0.329	0.528	0.873	0.431	NT	0.211	Dry	Dry
10/14/2025	Barium, total	2	mg/L	0.0907	0.1040	0.33	0.562	0.849	0.338	NT	0.221	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Cadmium, total	0.005	mg/L	0.0063	NT	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	Dry	Dry
4/4/2016	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	Dry	Dry
10/4/2016	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
4/3/2017	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	0.0018	<0.0008	<0.0008
10/3/2017	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
4/10/2018	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
10/12/2018	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
4/17/2019	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
9/30/2019	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
4/7/2020	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
10/7/2020	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
4/16/2021	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
10/14/2021	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	<0.0008
4/4/2022	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	Dry
10/4/2022	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	Dry
4/13/2023	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	<0.0008	Dry
10/18/2023	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	Dry	Dry
4/8/2024	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	Dry	Dry
10/8/2024	Cadmium, total	0.005	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	NT	<0.0008	Dry	Dry
4/3/2025	Cadmium, total	0.005	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NT	0.0006	Dry	Dry
10/14/2025	Cadmium, total	0.005	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NT	0.0002	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Cobalt, total	0.0028	mg/L	<0.0008	NT	0.0025	0.0172	0.0012	0.0061	<0.0008	0.0021	Dry	Dry
4/4/2016	Cobalt, total	0.0028	mg/L	<0.0008	0.0013	0.0015	0.0131	0.0014	0.0112	<0.0008	<0.0008	Dry	Dry
10/4/2016	Cobalt, total	0.0028	mg/L	<0.0008	<0.0008	0.0010	0.0084	0.0008	0.0086	<0.0008	0.0022	0.0043	0.0066
4/3/2017	Cobalt, total	0.0028	mg/L	<0.0008	<0.0008	0.0137	0.0069	0.0036	0.0144	NT	0.0013	0.004	0.0027
10/3/2017	Cobalt, total	0.0028	mg/L	<0.0008	<0.0008	0.0073	0.0092	0.0012	0.0046	NT	0.0107	0.0023	0.0023
4/10/2018	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0020	0.0134	0.0016	0.0031	NT	0.0095	0.0039	0.0033
10/12/2018	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0010	0.0082	0.0011	0.0027	NT	0.0013	0.0025	0.0027
4/17/2019	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0011	0.0048	0.0012	0.0097	NT	0.0038	0.0032	0.0025
9/30/2019	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0019	0.0043	0.0010	0.0048	NT	0.0093	0.0035	0.0024
4/7/2020	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0026	0.0079	0.0005	0.0111	NT	0.0079	0.0023	0.0018
10/7/2020	Cobalt, total	0.0021	mg/L	<0.0008	<0.0008	0.0024	0.0105	<0.0008	0.0044	NT	<0.0004	0.0020	0.0021
4/16/2021	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0023	0.0044	0.0005	0.0101	NT	0.0011	0.0025	0.0015
10/14/2021	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0021	0.0174	0.0007	0.0044	NT	0.0090	0.0024	0.0022
4/4/2022	Cobalt, total	0.0021	mg/L	0.0005	<0.0004	0.0014	0.0161	0.0017	0.0079	NT	<0.0004	0.0042	Dry
10/4/2022	Cobalt, total	0.0021	mg/L	0.002	0.0021	0.0029	0.0115	0.0024	0.0066	NT	0.0019	0.0052	Dry
4/13/2023	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0012	0.0063	0.0005	0.0053	NT	0.0019	0.0017	Dry
10/18/2023	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0013	0.0090	<0.0004	0.0051	NT	<0.0004	Dry	Dry
4/8/2024	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0013	0.0064	<0.0004	0.0022	NT	0.0011	Dry	Dry
10/8/2024	Cobalt, total	0.0021	mg/L	<0.0004	<0.0004	0.0011	0.0064	0.0005	0.0079	NT	0.0054	Dry	Dry
4/3/2025	Cobalt, total	0.0021	mg/L	<0.0005	<0.0005	0.0011	0.0069	<0.0005	0.0118	NT	0.0073	Dry	Dry
10/14/2025	Cobalt, total	0.0021	mg/L	<0.0005	<0.0005	0.0011	0.0082	0.0005	0.0078	NT	0.0146	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Copper, total	1.3	mg/L	0.0042	NT	<0.004	<0.004	<0.004	<0.004	0.0043	<0.004	Dry	Dry
4/4/2016	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	Dry	Dry
10/4/2016	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0084
4/3/2017	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	0.0080
10/3/2017	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	0.0060
4/10/2018	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	0.0066
10/12/2018	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	0.0069
4/17/2019	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
9/30/2019	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/7/2020	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	0.0081	<0.004	<0.004
10/7/2020	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/16/2021	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
10/14/2021	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/4/2022	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	Dry
10/4/2022	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	0.0082	Dry
4/13/2023	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	Dry
10/18/2023	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
4/8/2024	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
10/8/2024	Copper, total	1.3	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
4/3/2025	Copper, total	1.3	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NT	<0.005	Dry	Dry
10/14/2025	Copper, total	1.3	mg/L	<0.005	<0.005	0.0118	<0.005	<0.005	<0.005	NT	<0.005	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Nickel, total	0.1	mg/L	<0.004	NT	0.0063	0.0161	<0.004	0.0126	0.0041	0.0047	Dry	Dry
4/4/2016	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0046	0.0060	0.0049	0.0121	<0.004	0.0058	Dry	Dry
10/4/2016	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0056	<0.004	0.0067	<0.004	<0.004	<0.004	0.0216
4/3/2017	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0088	0.0046	0.0057	0.0122	NT	0.0204	0.0066	0.0104
10/3/2017	Nickel, total	0.1	mg/L	0.0089	<0.004	0.0086	0.0051	<0.004	0.0072	NT	0.0283	<0.004	0.0076
4/10/2018	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0059	<0.004	<0.004	0.0088	NT	0.0333	0.0194	0.0271
10/12/2018	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	0.0084	NT	<0.008	<0.004	0.0134
4/17/2019	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0045	0.0052	<0.004	0.0091	NT	0.0074	0.007	0.0075
9/30/2019	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0063	0.0051	<0.004	0.0079	NT	0.0108	0.0112	0.0079
4/7/2020	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0069	0.0046	<0.004	0.0127	NT	0.0097	0.0092	0.0060
10/7/2020	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0053	0.0104	<0.004	0.0082	NT	<0.008	0.0048	0.0072
4/16/2021	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0047	<0.004	<0.004	0.0122	NT	0.0048	0.0072	<0.004
10/14/2021	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0207	<0.004	0.0084	NT	0.0142	0.0110	0.0074
4/4/2022	Nickel, total	0.1	mg/L	<0.004	<0.004	0.0042	0.0208	0.0055	0.0122	NT	<0.004	0.0306	Dry
10/4/2022	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0062	<0.004	0.0086	NT	<0.004	0.0294	Dry
4/13/2023	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0044	<0.004	0.0100	NT	0.0079	0.0053	Dry
10/18/2023	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.009	<0.004	0.0092	NT	0.0121	Dry	Dry
4/8/2024	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0068	<0.004	0.0097	NT	0.0204	Dry	Dry
10/8/2024	Nickel, total	0.1	mg/L	<0.004	<0.004	<0.004	0.0051	<0.004	0.0111	NT	0.0239	Dry	Dry
4/3/2025	Nickel, total	0.1	mg/L	<0.005	<0.005	<0.005	0.0055	<0.005	0.0129	NT	0.0210	Dry	Dry
10/14/2025	Nickel, total	0.1	mg/L	<0.005	<0.005	<0.005	0.0055	<0.005	0.0110	NT	0.0193	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Lead, total	0.015	mg/L	<0.004	NT	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	Dry	Dry
4/4/2016	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	Dry	Dry
10/4/2016	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
4/3/2017	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
10/3/2017	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/10/2018	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
10/12/2018	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/17/2019	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
9/30/2019	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/7/2020	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
10/7/2020	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/16/2021	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
10/14/2021	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	<0.004
4/4/2022	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	0.0127	Dry
10/4/2022	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	Dry
4/13/2023	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	<0.004	Dry
10/18/2023	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
4/8/2024	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
10/8/2024	Lead, total	0.015	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NT	<0.004	Dry	Dry
4/3/2025	Lead, total	0.015	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NT	<0.001	Dry	Dry
10/14/2025	Lead, total	0.015	mg/L	<0.001	<0.001	0.0026	<0.001	<0.001	<0.001	NT	<0.001	Dry	Dry

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Date	Compound	Statewide Standard IAC-137	Units	MW-10 (upgradient)	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-19	MW-20
10/5/2015	Zinc, total	2	mg/L	0.01	NT	0.0121	<0.008	0.0083	<0.008	0.0218	0.009	Dry	Dry
4/4/2016	Zinc, total	2	mg/L	<0.008	0.073	<0.008	<0.008	0.0150	<0.008	0.0123	0.0123	Dry	Dry
10/4/2016	Zinc, total	2	mg/L	<0.008	0.135	0.0099	<0.008	0.0112	<0.008	0.0161	<0.008	<0.008	0.0166
4/3/2017	Zinc, total	2	mg/L	<0.008	0.0373	<0.008	<0.008	<0.008	<0.008	NT	0.0164	<0.008	0.0116
10/3/2017	Zinc, total	2	mg/L	<0.008	0.0168	<0.008	<0.008	<0.008	<0.008	NT	0.0084	0.0132	0.0085
4/10/2018	Zinc, total	2	mg/L	<0.008	0.0144	0.0122	<0.008	<0.008	<0.008	NT	<0.020	<0.020	<0.020
10/12/2018	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.008	NT	<0.020	<0.020	<0.020
4/17/2019	Zinc, total	2	mg/L	<0.008	0.0092	<0.008	<0.008	<0.008	<0.008	NT	<0.008	<0.008	0.0089
9/30/2019	Zinc, total	2	mg/L	<0.008	0.0098	<0.008	<0.020	0.0097	<0.008	NT	<0.008	0.0109	0.0104
4/7/2020	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	<0.020
10/7/2020	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	<0.020
4/16/2021	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	<0.020
10/14/2021	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	0.0291
4/4/2022	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	Dry
10/4/2022	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	Dry
4/13/2023	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	<0.020	Dry
10/18/2023	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	Dry	Dry
4/8/2024	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	Dry	Dry
10/8/2024	Zinc, total	2	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	<0.020	Dry	Dry
4/3/2025	Zinc, total	2	mg/L	<0.005	0.0150	0.0088	<0.005	0.0063	<0.005	NT	0.0132	Dry	Dry
10/14/2025	Zinc, total	2	mg/L	<0.005	0.0108	0.0244	0.0050	0.0090	<0.005	NT	0.0125	Dry	Dry



= value exceeds the Statewide Standard for PROTECTED Groundwater

= value exceeds the Statewide Standard for NON-PROTECTED Groundwater



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1ID0774

Project Description

6040

For:

Todd Whipple

HLW Engineering

204 West Broad St

Story City, IA 50248

Heather Murphy

Customer Relationship Specialist

Friday, June 20, 2025

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac Laboratories, Inc., Newton. If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed above.

I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.

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CERTIFICATE OF ANALYSIS

1ID0774

HLW Engineering

Todd Whipple
204 West Broad St
Story City, IA 50248

Project Name: 6040

Project / PO Number: N/A
Received: 04/04/2025
Reported: 06/20/2025

Sample Summary Report

<u>Sample Name</u>	<u>Laboratory ID</u>	<u>Client Matrix</u>	<u>Sample Type</u>	<u>Sample Begin</u>	<u>Sample Taken</u>	<u>Lab Received</u>
MW-10	1ID0774-01	Aqueous	GRAB		04/03/25 15:02	04/04/25 10:33
MW-11	1ID0774-02	Aqueous	GRAB		04/03/25 15:28	04/04/25 10:33
MW-12	1ID0774-03	Aqueous	GRAB		04/03/25 15:39	04/04/25 10:33
MW-13	1ID0774-04	Aqueous	GRAB		04/03/25 16:02	04/04/25 10:33
MW-14	1ID0774-05	Aqueous	GRAB		04/03/25 16:31	04/04/25 10:33
MW-15	1ID0774-06	Aqueous	GRAB		04/03/25 16:22	04/04/25 10:33
MW-17	1ID0774-07	Aqueous	GRAB		04/03/25 14:25	04/04/25 10:33
Field Duplicate	1ID0774-08	Aqueous	GRAB		04/03/25 00:00	04/04/25 10:33



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1ID0774

Analytical Testing Parameters

Client Sample ID:	MW-10	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	04/03/2025 15:02
Lab Sample ID:	1ID0774-01		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1736	RVV
Arsenic, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1736	RVV
Barium, total	0.0944	0.0010	mg/L		04/17/25 1607	06/18/25 1736	RVV
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1736	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1736	RVV
Chromium, total	0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1736	RVV
Cobalt, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1736	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1736	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1736	RVV
Nickel, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1736	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1736	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1736	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1736	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1736	RVV
Zinc, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1736	RVV

Client Sample ID:	MW-11	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	04/03/2025 15:28
Lab Sample ID:	1ID0774-02		

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Vinyl Chloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Bromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Chloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Trichlorofluoromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,1-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Acetone	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Methyl Iodide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Carbon Disulfide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Methylene Chloride	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Acrylonitrile	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,1-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Vinyl Acetate	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
2-Butanone (MEK)	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Bromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Chloroform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM

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CERTIFICATE OF ANALYSIS

1ID0774

Client Sample ID: MW-11
Sample Matrix: Aqueous
Lab Sample ID: 1ID0774-02

Collected By: Whipple, Todd
Collection Date: 04/03/2025 15:28

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
1,1,1-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Carbon Tetrachloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Benzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Trichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2-Dichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Dibromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Bromodichloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Toluene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,1,2-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Tetrachloroethylene	2.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
2-Hexanone (MBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Dibromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2-Dibromoethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Chlorobenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Ethylbenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Xylenes, total	<2.0	2.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Styrene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Bromoform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2,3-Trichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,4-Dichlorobenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2-Dichlorobenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1633	CSM
Surrogate: Dibromofluoromethane	88.8	Limit: 57-134	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: Dibromofluoromethane	88.8	Limit: 75-136	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: 1,2-Dichloroethane-d4	81.7	Limit: 53-140	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: 1,2-Dichloroethane-d4	81.7	Limit: 61-142	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: Toluene-d8	106	Limit: 86-114	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: Toluene-d8	106	Limit: 82-121	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: 4-Bromofluorobenzene	93.1	Limit: 78-121	% Rec		04/07/25 0000	04/07/25 1633	CSM
Surrogate: 4-Bromofluorobenzene	93.1	Limit: 80-116	% Rec		04/07/25 0000	04/07/25 1633	CSM

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1743	RVV
Arsenic, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1743	RVV
Barium, total	0.107	0.0010	mg/L		04/17/25 1607	06/18/25 1743	RVV



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CERTIFICATE OF ANALYSIS

1ID0774

Client Sample ID: MW-11
Sample Matrix: Aqueous
Lab Sample ID: 1ID0774-02

Collected By: Whipple, Todd
Collection Date: 04/03/2025 15:28

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1743	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1743	RVV
Chromium, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1743	RVV
Cobalt, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1743	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1743	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1743	RVV
Nickel, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1743	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1743	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1743	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1743	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1743	RVV
Zinc, total	0.0150	0.0050	mg/L		04/17/25 1607	06/18/25 1743	RVV

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CERTIFICATE OF ANALYSIS

1ID0774

Client Sample ID: MW-12
Sample Matrix: Aqueous
Lab Sample ID: 1ID0774-03

Collected By: Whipple, Todd
Collection Date: 04/03/2025 15:39

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Vinyl Chloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Bromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Chloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Trichlorofluoromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Acetone	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Methyl Iodide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Carbon Disulfide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Methylene Chloride	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Acrylonitrile	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Vinyl Acetate	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
2-Butanone (MEK)	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Bromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Chloroform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1,1-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Carbon Tetrachloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Benzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Trichloroethylene	1.8	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2-Dichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Dibromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Bromodichloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Toluene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1,2-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Tetrachloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
2-Hexanone (MBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Dibromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2-Dibromoethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Chlorobenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Ethylbenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Xylenes, total	<2.0	2.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Styrene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Bromoform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2,3-Trichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM

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CERTIFICATE OF ANALYSIS

11D0774

Client Sample ID: MW-12
Sample Matrix: Aqueous
Lab Sample ID: 11D0774-03

Collected By: Whipple, Todd
Collection Date: 04/03/2025 15:39

Determination of Volatile Organic Compounds		Result	RL	Units	Note	Prepared	Analyzed	Analyst
trans-1,4-Dichloro-2-butene		<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,1,2,2-Tetrachloroethane		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,4-Dichlorobenzene		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2-Dichlorobenzene		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
1,2-Dibromo-3-chloropropane		<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1656	CSM
Surrogate: Dibromofluoromethane	88.0	Limit: 57-134	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: Dibromofluoromethane	88.0	Limit: 75-136	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: 1,2-Dichloroethane-d4	84.2	Limit: 53-140	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: 1,2-Dichloroethane-d4	84.2	Limit: 61-142	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: Toluene-d8	107	Limit: 86-114	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: Toluene-d8	107	Limit: 82-121	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: 4-Bromofluorobenzene	93.1	Limit: 80-116	% Rec			04/07/25 0000	04/07/25 1656	CSM
Surrogate: 4-Bromofluorobenzene	93.1	Limit: 78-121	% Rec			04/07/25 0000	04/07/25 1656	CSM

Determination of Total Metals		Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A								
Antimony, total		<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1746	RVV
Arsenic, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1746	RVV
Barium, total	0.329		0.0010	mg/L		04/17/25 1607	06/18/25 1746	RVV
Beryllium, total		<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1746	RVV
Cadmium, total		<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1746	RVV
Chromium, total		<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1746	RVV
Cobalt, total	0.0011		0.0005	mg/L		04/17/25 1607	06/18/25 1746	RVV
Copper, total		<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1746	RVV
Lead, total		<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1746	RVV
Nickel, total		<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1746	RVV
Selenium, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1746	RVV
Silver, total		<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1746	RVV
Thallium, total		<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1746	RVV
Vanadium, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1746	RVV
Zinc, total	0.0088		0.0050	mg/L		04/17/25 1607	06/18/25 1746	RVV

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CERTIFICATE OF ANALYSIS

11D0774

Client Sample ID:	MW-13	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	04/03/2025 16:02
Lab Sample ID:	11D0774-04		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1748	RVV
Arsenic, total	0.0086	0.0020	mg/L		04/17/25 1607	06/18/25 1748	RVV
Barium, total	0.528	0.0010	mg/L		04/17/25 1607	06/18/25 1748	RVV
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1748	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1748	RVV
Chromium, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1748	RVV
Cobalt, total	0.0069	0.0005	mg/L		04/17/25 1607	06/18/25 1748	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1748	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1748	RVV
Nickel, total	0.0055	0.0050	mg/L		04/17/25 1607	06/18/25 1748	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1748	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1748	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1748	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1748	RVV
Zinc, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1748	RVV

Client Sample ID:	MW-14	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	04/03/2025 16:31
Lab Sample ID:	11D0774-05		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/19/25 0935	RVV
Arsenic, total	0.0075	0.0020	mg/L		04/17/25 1607	06/19/25 0935	RVV
Barium, total	0.873	0.0010	mg/L		04/17/25 1607	06/19/25 0935	RVV
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/19/25 0935	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/19/25 0935	RVV
Chromium, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/19/25 0935	RVV
Cobalt, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/19/25 0935	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/19/25 0935	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/19/25 0935	RVV
Nickel, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/19/25 0935	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/19/25 0935	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/19/25 0935	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/19/25 0935	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/19/25 0935	RVV
Zinc, total	0.0063	0.0050	mg/L		04/17/25 1607	06/19/25 0935	RVV

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CERTIFICATE OF ANALYSIS

1ID0774

Client Sample ID: MW-15
Sample Matrix: Aqueous
Lab Sample ID: 1ID0774-06

Collected By: Whipple, Todd
Collection Date: 04/03/2025 16:22

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1753	RVV
Arsenic, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1753	RVV
Barium, total	0.431	0.0010	mg/L		04/17/25 1607	06/18/25 1753	RVV
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1753	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1753	RVV
Chromium, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1753	RVV
Cobalt, total	0.0118	0.0005	mg/L		04/17/25 1607	06/18/25 1753	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1753	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1753	RVV
Nickel, total	0.0129	0.0050	mg/L		04/17/25 1607	06/18/25 1753	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1753	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1753	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1753	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1753	RVV
Zinc, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1753	RVV

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CERTIFICATE OF ANALYSIS

1ID0774

Client Sample ID: MW-17
Sample Matrix: Aqueous
Lab Sample ID: 1ID0774-07

Collected By: Whipple, Todd
Collection Date: 04/03/2025 14:25

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Vinyl Chloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Bromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Chloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Trichlorofluoromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Acetone	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Methyl Iodide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Carbon Disulfide	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Methylene Chloride	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Acrylonitrile	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Vinyl Acetate	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
2-Butanone (MEK)	<10.0	10.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Bromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Chloroform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1,1-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Carbon Tetrachloride	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Benzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2-Dichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Trichloroethylene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2-Dichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Dibromomethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Bromodichloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Toluene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1,2-Trichloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Tetrachloroethylene	1.2	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
2-Hexanone (MBK)	<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Dibromochloromethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2-Dibromoethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Chlorobenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Ethylbenzene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Xylenes, total	<2.0	2.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Styrene	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Bromoform	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2,3-Trichloropropane	<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM

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CERTIFICATE OF ANALYSIS

11D0774

Client Sample ID: MW-17
Sample Matrix: Aqueous
Lab Sample ID: 11D0774-07

Collected By: Whipple, Todd
Collection Date: 04/03/2025 14:25

Determination of Volatile Organic Compounds		Result	RL	Units	Note	Prepared	Analyzed	Analyst
trans-1,4-Dichloro-2-butene		<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,1,2,2-Tetrachloroethane		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,4-Dichlorobenzene		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2-Dichlorobenzene		<1.0	1.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
1,2-Dibromo-3-chloropropane		<5.0	5.0	ug/L		04/07/25 0000	04/07/25 1718	CSM
Surrogate: Dibromofluoromethane	84.7	Limit: 75-136	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: Dibromofluoromethane	84.7	Limit: 57-134	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: 1,2-Dichloroethane-d4	75.0	Limit: 61-142	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: 1,2-Dichloroethane-d4	75.0	Limit: 53-140	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: Toluene-d8	107	Limit: 82-121	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: Toluene-d8	107	Limit: 86-114	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: 4-Bromofluorobenzene	90.8	Limit: 80-116	% Rec			04/07/25 0000	04/07/25 1718	CSM
Surrogate: 4-Bromofluorobenzene	90.8	Limit: 78-121	% Rec			04/07/25 0000	04/07/25 1718	CSM

Determination of Total Metals		Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A								
Antimony, total		<0.0010	0.0010	mg/L		04/17/25 1607	06/19/25 0938	RVV
Arsenic, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/19/25 0938	RVV
Barium, total	0.211		0.0010	mg/L		04/17/25 1607	06/19/25 0938	RVV
Beryllium, total		<0.0005	0.0005	mg/L		04/17/25 1607	06/19/25 0938	RVV
Cadmium, total	0.0006		0.0002	mg/L		04/17/25 1607	06/19/25 0938	RVV
Chromium, total	0.0019		0.0010	mg/L		04/17/25 1607	06/19/25 0938	RVV
Cobalt, total	0.0073		0.0005	mg/L		04/17/25 1607	06/19/25 0938	RVV
Copper, total		<0.0050	0.0050	mg/L		04/17/25 1607	06/19/25 0938	RVV
Lead, total		<0.0010	0.0010	mg/L		04/17/25 1607	06/19/25 0938	RVV
Nickel, total	0.0210		0.0050	mg/L		04/17/25 1607	06/19/25 0938	RVV
Selenium, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/19/25 0938	RVV
Silver, total		<0.0050	0.0050	mg/L		04/17/25 1607	06/19/25 0938	RVV
Thallium, total		<0.0005	0.0005	mg/L		04/17/25 1607	06/19/25 0938	RVV
Vanadium, total		<0.0020	0.0020	mg/L		04/17/25 1607	06/19/25 0938	RVV
Zinc, total	0.0132		0.0050	mg/L		04/17/25 1607	06/19/25 0938	RVV

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CERTIFICATE OF ANALYSIS

11D0774

Client Sample ID:	Field Duplicate	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	04/03/2025
Lab Sample ID:	11D0774-08		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1758	RVV
Arsenic, total	0.0084	0.0020	mg/L		04/17/25 1607	06/18/25 1758	RVV
Barium, total	0.486	0.0010	mg/L		04/17/25 1607	06/18/25 1758	RVV
Beryllium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1758	RVV
Cadmium, total	<0.0002	0.0002	mg/L		04/17/25 1607	06/18/25 1758	RVV
Chromium, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1758	RVV
Cobalt, total	0.0066	0.0005	mg/L		04/17/25 1607	06/18/25 1758	RVV
Copper, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1758	RVV
Lead, total	<0.0010	0.0010	mg/L		04/17/25 1607	06/18/25 1758	RVV
Nickel, total	0.0055	0.0050	mg/L		04/17/25 1607	06/18/25 1758	RVV
Selenium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1758	RVV
Silver, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1758	RVV
Thallium, total	<0.0005	0.0005	mg/L		04/17/25 1607	06/18/25 1758	RVV
Vanadium, total	<0.0020	0.0020	mg/L		04/17/25 1607	06/18/25 1758	RVV
Zinc, total	<0.0050	0.0050	mg/L		04/17/25 1607	06/18/25 1758	RVV

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CERTIFICATE OF ANALYSIS

1ID0774

Batch Log Summary

Method	Batch	Laboratory ID	Client / Source ID
EPA 8260D	1ID0340	1ID0340-BS1	
		1ID0340-BSD1	
		1ID0340-BLK1	
		1ID0774-02	MW-11
		1ID0774-03	MW-12
		1ID0774-07	MW-17
		1ID0340-MS1	1ID0773-01
		1ID0340-MSD1	1ID0773-01
Method	Batch	Laboratory ID	Client / Source ID
EPA 6020A	1ID0775	1ID0775-BLK2	
		1ID0775-BS2	
		1ID0774-01	MW-10
		1ID0774-02	MW-11
		1ID0774-03	MW-12
		1ID0774-04	MW-13
		1ID0774-06	MW-15
		1ID0774-08	Field Duplicate
		1ID0775-MS2	3IC0116-01RE1
		1ID0775-MSD2	3IC0116-01RE1
		1ID0774-05	MW-14
		1ID0774-07	MW-17
		1ID0775-PS2	3IC0116-01RE1
		1ID0775-BS2	

Batch Quality Control Summary: Microbac Laboratories, Inc., Newton

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
Blank (1ID0340-BLK1)				Prepared: 04/07/25 00:00 Analyzed: 04/07/25 15:48						
Chloromethane	<1.0	1.0	ug/L							
Vinyl Chloride	<1.0	1.0	ug/L							
Bromomethane	<1.0	1.0	ug/L							
Chloroethane	<1.0	1.0	ug/L							
Trichlorofluoromethane	<1.0	1.0	ug/L							
1,1-Dichloroethylene	<1.0	1.0	ug/L							
Acetone	<10.0	10.0	ug/L							
Methyl Iodide	<1.0	1.0	ug/L							
Carbon Disulfide	<1.0	1.0	ug/L							
Methylene Chloride	<5.0	5.0	ug/L							

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
Blank (1ID0340-BLK1)				Prepared: 04/07/25 00:00 Analyzed: 04/07/25 15:48						
Acrylonitrile	<5.0	5.0	ug/L							
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L							
1,1-Dichloroethane	<1.0	1.0	ug/L							
Vinyl Acetate	<5.0	5.0	ug/L							
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L							
2-Butanone (MEK)	<10.0	10.0	ug/L							
Bromochloromethane	<1.0	1.0	ug/L							
Chloroform	<1.0	1.0	ug/L							
1,1,1-Trichloroethane	<1.0	1.0	ug/L							
Carbon Tetrachloride	<1.0	1.0	ug/L							
Benzene	<1.0	1.0	ug/L							
1,2-Dichloroethane	<1.0	1.0	ug/L							
Trichloroethylene	<1.0	1.0	ug/L							
1,2-Dichloropropane	<1.0	1.0	ug/L							
Dibromomethane	<1.0	1.0	ug/L							
Bromodichloromethane	<1.0	1.0	ug/L							
cis-1,3-Dichloropropene	<1.0	1.0	ug/L							
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L							
Toluene	<1.0	1.0	ug/L							
trans-1,3-Dichloropropene	<1.0	1.0	ug/L							
1,1,2-Trichloroethane	<1.0	1.0	ug/L							
Tetrachloroethylene	<1.0	1.0	ug/L							
2-Hexanone (MBK)	<5.0	5.0	ug/L							
Dibromochloromethane	<1.0	1.0	ug/L							
1,2-Dibromoethane	<1.0	1.0	ug/L							
Chlorobenzene	<1.0	1.0	ug/L							
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L							
Ethylbenzene	<1.0	1.0	ug/L							
Xylenes, total	<2.0	2.0	ug/L							
Styrene	<1.0	1.0	ug/L							
Bromoform	<1.0	1.0	ug/L							
1,2,3-Trichloropropane	<1.0	1.0	ug/L							
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L							
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L							
1,4-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L							
Surrogate: Dibromofluoromethane	40.6		ug/L	50.2		80.9	57-134			
Surrogate: Dibromofluoromethane	40.6		ug/L	50.2		80.9	75-136			
Surrogate: 1,2-Dichloroethane-d4	39.4		ug/L	50.1		78.7	53-140			
Surrogate: 1,2-Dichloroethane-d4	39.4		ug/L	50.1		78.7	61-142			
Surrogate: Toluene-d8	53.2		ug/L	50.4		106	86-114			
Surrogate: Toluene-d8	53.2		ug/L	50.4		106	82-121			

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D									
Blank (1ID0340-BLK1)									
				Prepared: 04/07/25 00:00 Analyzed: 04/07/25 15:48					
Surrogate: 4-Bromofluorobenzene	45.5		ug/L	50.1		90.7 78-121			
Surrogate: 4-Bromofluorobenzene	45.5		ug/L	50.1		90.7 80-116			
LCS (1ID0340-BS1)									
				Prepared: 04/07/25 00:00 Analyzed: 04/07/25 14:41					
Chloromethane	29.73	1.0	ug/L	30.3		98.1 63-155			
Vinyl Chloride	30.96	1.0	ug/L	30.2		102 70-154			
Bromomethane	29.38	1.0	ug/L	30.1		97.5 52-176			
Chloroethane	30.81	1.0	ug/L	30.3		102 72-148			
Trichlorofluoromethane	31.55	1.0	ug/L	30.3		104 70-152			
1,1-Dichloroethylene	59.01	1.0	ug/L	50.1		118 70-148			
Acetone	106.3	10.0	ug/L	100		106 43-172			
Methyl Iodide	102.2	1.0	ug/L	100		102 69-170			
Carbon Disulfide	111.5	1.0	ug/L	100		112 72-162			
Methylene Chloride	47.26	5.0	ug/L	50.1		94.3 68-142			
Acrylonitrile	43.38	5.0	ug/L	50.2		86.4 56-135			
trans-1,2-Dichloroethylene	56.44	1.0	ug/L	50.1		113 66-148			
1,1-Dichloroethane	54.12	1.0	ug/L	50.1		108 66-143			
Vinyl Acetate	142.2	5.0	ug/L	140		102 43-153			
cis-1,2-Dichloroethylene	51.81	1.0	ug/L	50.4		103 71-149			
2-Butanone (MEK)	88.82	10.0	ug/L	100		88.8 52-159			
Bromochloromethane	51.01	1.0	ug/L	50.4		101 69-143			
Chloroform	51.63	1.0	ug/L	50.1		103 69-144			
1,1,1-Trichloroethane	56.41	1.0	ug/L	50.1		113 62-129			
Carbon Tetrachloride	55.78	1.0	ug/L	50.1		111 63-141			
Benzene	48.86	1.0	ug/L	50.4		96.9 71-134			
1,2-Dichloroethane	49.23	1.0	ug/L	50.1		98.3 72-132			
Trichloroethylene	51.59	1.0	ug/L	50.1		103 71-135			
1,2-Dichloropropane	48.67	1.0	ug/L	50.1		97.2 69-136			
Dibromomethane	48.52	1.0	ug/L	50.4		96.3 73-147			
Bromodichloromethane	50.13	1.0	ug/L	50.1		100 68-129			
cis-1,3-Dichloropropene	47.35	1.0	ug/L	50.1		94.5 65-134			
4-Methyl-2-pentanone (MIBK)	90.02	5.0	ug/L	100		90.0 58-147			
Toluene	53.95	1.0	ug/L	50.5		107 72-133			
trans-1,3-Dichloropropene	46.04	1.0	ug/L	50.1		91.9 67-130			
1,1,2-Trichloroethane	42.31	1.0	ug/L	50.1		84.5 69-135			
Tetrachloroethylene	53.76	1.0	ug/L	50.1		107 69-130			
2-Hexanone (MBK)	95.65	5.0	ug/L	100		95.6 55-144			
Dibromochloromethane	48.23	1.0	ug/L	50.1		96.3 73-127			
1,2-Dibromoethane	48.95	1.0	ug/L	50.2		97.5 67-132			
Chlorobenzene	48.76	1.0	ug/L	50.1		97.4 72-123			
1,1,1,2-Tetrachloroethane	45.88	1.0	ug/L	50.3		91.1 73-127			
Ethylbenzene	54.95	1.0	ug/L	50.2		110 71-127			
Xylenes, total	161.1	2.0	ug/L	151		107 74-127			

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
LCS (1ID0340-BS1) Prepared: 04/07/25 00:00 Analyzed: 04/07/25 14:41										
Styrene	52.18	1.0	ug/L	50.4		104	66-126			
Bromoform	45.61	1.0	ug/L	50.1		91.0	68-130			
1,2,3-Trichloropropane	39.52	1.0	ug/L	50.3		78.5	63-136			
trans-1,4-Dichloro-2-butene	84.43	5.0	ug/L	100		84.4	54-134			
1,1,2,2-Tetrachloroethane	45.44	1.0	ug/L	50.1		90.7	61-131			
1,4-Dichlorobenzene	45.44	1.0	ug/L	50.1		90.7	70-129			
1,2-Dichlorobenzene	41.30	1.0	ug/L	50.1		82.4	69-126			
1,2-Dibromo-3-chloropropane	27.55	5.0	ug/L	50.1		55.0	50-143			
Surrogate: Dibromofluoromethane	49.4		ug/L	50.2		98.5	57-134			
Surrogate: Dibromofluoromethane	49.4		ug/L	50.2		98.5	75-136			
Surrogate: 1,2-Dichloroethane-d4	47.1		ug/L	50.1		94.0	53-140			
Surrogate: 1,2-Dichloroethane-d4	47.1		ug/L	50.1		94.0	61-142			
Surrogate: Toluene-d8	50.7		ug/L	50.4		101	86-114			
Surrogate: Toluene-d8	50.7		ug/L	50.4		101	82-121			
Surrogate: 4-Bromofluorobenzene	47.5		ug/L	50.1		94.6	78-121			
Surrogate: 4-Bromofluorobenzene	47.5		ug/L	50.1		94.6	80-116			
LCS Dup (1ID0340-BSD1) Prepared: 04/07/25 00:00 Analyzed: 04/07/25 15:04										
Chloromethane	31.38	1.0	ug/L	30.3		103	63-155	5.40	24	
Vinyl Chloride	31.18	1.0	ug/L	30.2		103	70-154	0.708	25	
Bromomethane	31.05	1.0	ug/L	30.1		103	52-176	5.53	27	
Chloroethane	31.95	1.0	ug/L	30.3		105	72-148	3.63	25	
Trichlorofluoromethane	32.04	1.0	ug/L	30.3		106	70-152	1.54	26	
1,1-Dichloroethylene	59.88	1.0	ug/L	50.1		119	70-148	1.46	24	
Acetone	125.3	10.0	ug/L	100		125	43-172	16.4	30	
Methyl Iodide	110.0	1.0	ug/L	100		110	69-170	7.40	30	
Carbon Disulfide	111.6	1.0	ug/L	100		112	72-162	0.0359	24	
Methylene Chloride	54.41	5.0	ug/L	50.1		109	68-142	14.1	21	
Acrylonitrile	56.84	5.0	ug/L	50.2		113	56-135	26.9	16	R1
trans-1,2-Dichloroethylene	58.69	1.0	ug/L	50.1		117	66-148	3.91	27	
1,1-Dichloroethane	58.07	1.0	ug/L	50.1		116	66-143	7.04	24	
Vinyl Acetate	181.0	5.0	ug/L	140		129	43-153	24.0	30	
cis-1,2-Dichloroethylene	57.20	1.0	ug/L	50.4		114	71-149	9.89	26	
2-Butanone (MEK)	111.0	10.0	ug/L	100		111	52-159	22.2	27	
Bromochloromethane	58.74	1.0	ug/L	50.4		117	69-143	14.1	23	
Chloroform	57.16	1.0	ug/L	50.1		114	69-144	10.2	23	
1,1,1-Trichloroethane	58.67	1.0	ug/L	50.1		117	62-129	3.93	24	
Carbon Tetrachloride	56.49	1.0	ug/L	50.1		113	63-141	1.26	25	
Benzene	51.77	1.0	ug/L	50.4		103	71-134	5.78	24	
1,2-Dichloroethane	56.81	1.0	ug/L	50.1		113	72-132	14.3	24	
Trichloroethylene	53.33	1.0	ug/L	50.1		106	71-135	3.32	24	
1,2-Dichloropropane	54.36	1.0	ug/L	50.1		109	69-136	11.0	24	
Dibromomethane	57.19	1.0	ug/L	50.4		114	73-147	16.4	25	
Bromodichloromethane	58.16	1.0	ug/L	50.1		116	68-129	14.8	22	

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
LCS Dup (1ID0340-BSD1)				Prepared: 04/07/25 00:00 Analyzed: 04/07/25 15:04						
cis-1,3-Dichloropropene	55.51	1.0	ug/L	50.1		111	65-134	15.9	23	
4-Methyl-2-pentanone (MIBK)	122.0	5.0	ug/L	100		122	58-147	30.1	27	R1
Toluene	57.23	1.0	ug/L	50.5		113	72-133	5.90	24	
trans-1,3-Dichloropropene	56.71	1.0	ug/L	50.1		113	67-130	20.8	24	
1,1,2-Trichloroethane	52.88	1.0	ug/L	50.1		106	69-135	22.2	23	
Tetrachloroethylene	51.99	1.0	ug/L	50.1		104	69-130	3.35	25	
2-Hexanone (MBK)	122.1	5.0	ug/L	100		122	55-144	24.3	25	
Dibromochloromethane	56.46	1.0	ug/L	50.1		113	73-127	15.7	22	
1,2-Dibromoethane	55.68	1.0	ug/L	50.2		111	67-132	12.9	24	
Chlorobenzene	53.17	1.0	ug/L	50.1		106	72-123	8.65	23	
1,1,1,2-Tetrachloroethane	51.04	1.0	ug/L	50.3		101	73-127	10.6	24	
Ethylbenzene	55.55	1.0	ug/L	50.2		111	71-127	1.09	26	
Xylenes, total	166.5	2.0	ug/L	151		110	74-127	3.27	25	
Styrene	57.45	1.0	ug/L	50.4		114	66-126	9.61	23	
Bromoform	55.63	1.0	ug/L	50.1		111	68-130	19.8	23	
1,2,3-Trichloropropane	53.01	1.0	ug/L	50.3		105	63-136	29.2	24	R1
trans-1,4-Dichloro-2-butene	114.0	5.0	ug/L	100		114	54-134	29.8	27	R1
1,1,2,2-Tetrachloroethane	57.53	1.0	ug/L	50.1		115	61-131	23.5	29	
1,4-Dichlorobenzene	51.16	1.0	ug/L	50.1		102	70-129	11.8	24	
1,2-Dichlorobenzene	51.49	1.0	ug/L	50.1		103	69-126	22.0	26	
1,2-Dibromo-3-chloropropane	44.69	5.0	ug/L	50.1		89.2	50-143	47.5	30	R1
Surrogate: Dibromofluoromethane	53.7		ug/L	50.2		107	57-134			
Surrogate: Dibromofluoromethane	53.7		ug/L	50.2		107	75-136			
Surrogate: 1,2-Dichloroethane-d4	52.9		ug/L	50.1		106	53-140			
Surrogate: 1,2-Dichloroethane-d4	52.9		ug/L	50.1		106	61-142			
Surrogate: Toluene-d8	50.8		ug/L	50.4		101	86-114			
Surrogate: Toluene-d8	50.8		ug/L	50.4		101	82-121			
Surrogate: 4-Bromofluorobenzene	49.3		ug/L	50.1		98.4	78-121			
Surrogate: 4-Bromofluorobenzene	49.3		ug/L	50.1		98.4	80-116			
Matrix Spike (1ID0340-MS1)				Source: 1ID0773-01		Prepared: 04/07/25 00:00 Analyzed: 04/07/25 20:17				
Chloromethane	318.6	10.0	ug/L	303	ND	105	61-152			
Vinyl Chloride	330.7	10.0	ug/L	302	ND	109	66-149			
Bromomethane	309.4	10.0	ug/L	301	ND	103	43-171			
Chloroethane	329.7	10.0	ug/L	303	ND	109	69-148			
Trichlorofluoromethane	341.5	10.0	ug/L	303	ND	113	62-163			
1,1-Dichloroethylene	625.0	10.0	ug/L	501	ND	125	70-148			
Acetone	1193	100	ug/L	1000	ND	119	45-173			
Methyl Iodide	1079	10.0	ug/L	1000	ND	108	62-167			
Carbon Disulfide	1152	10.0	ug/L	1000	ND	115	71-163			
Methylene Chloride	527.4	50.0	ug/L	501	ND	105	69-140			
Acrylonitrile	517.0	50.0	ug/L	502	ND	103	38-147			
trans-1,2-Dichloroethylene	600.5	10.0	ug/L	501	ND	120	69-144			
1,1-Dichloroethane	594.2	10.0	ug/L	501	10.03	117	70-138			

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
Matrix Spike (1ID0340-MS1)	Source: 1ID0773-01			Prepared: 04/07/25 00:00 Analyzed: 04/07/25 20:17						
Vinyl Acetate	1662	50.0	ug/L	1400	ND	119	58-142			
cis-1,2-Dichloroethylene	571.9	10.0	ug/L	504	15.74	110	68-151			
2-Butanone (MEK)	1089	100	ug/L	1000	ND	109	50-160			
Bromochloromethane	565.6	10.0	ug/L	504	ND	112	65-143			
Chloroform	567.2	10.0	ug/L	501	ND	113	71-143			
1,1,1-Trichloroethane	606.9	10.0	ug/L	501	ND	121	63-133			
Carbon Tetrachloride	602.8	10.0	ug/L	501	ND	120	63-142			
Benzene	510.3	10.0	ug/L	504	ND	101	69-133			
1,2-Dichloroethane	540.5	10.0	ug/L	501	ND	108	63-138			
Trichloroethylene	530.1	10.0	ug/L	501	ND	106	71-133			
1,2-Dichloropropane	519.8	10.0	ug/L	501	ND	104	69-132			
Dibromomethane	535.8	10.0	ug/L	504	ND	106	70-147			
Bromodichloromethane	558.9	10.0	ug/L	501	ND	112	67-130			
cis-1,3-Dichloropropene	515.6	10.0	ug/L	501	ND	103	61-126			
4-Methyl-2-pentanone (MIBK)	1130	50.0	ug/L	1000	ND	113	55-147			
Toluene	566.2	10.0	ug/L	505	ND	112	71-133			
trans-1,3-Dichloropropene	496.7	10.0	ug/L	501	ND	99.2	63-124			
1,1,2-Trichloroethane	495.5	10.0	ug/L	501	ND	98.9	69-133			
Tetrachloroethylene	525.3	10.0	ug/L	501	ND	105	70-124			
2-Hexanone (MBK)	1134	50.0	ug/L	1000	ND	113	53-141			
Dibromochloromethane	522.8	10.0	ug/L	501	ND	104	74-122			
1,2-Dibromoethane	518.9	10.0	ug/L	502	ND	103	66-127			
Chlorobenzene	503.2	10.0	ug/L	501	ND	100	76-116			
1,1,1,2-Tetrachloroethane	499.1	10.0	ug/L	503	ND	99.1	77-121			
Ethylbenzene	553.5	10.0	ug/L	502	ND	110	73-124			
Xylenes, total	1636	20.0	ug/L	1510	ND	108	75-123			
Styrene	553.1	10.0	ug/L	504	ND	110	70-120			
Bromoform	504.0	10.0	ug/L	501	ND	101	70-124			
1,2,3-Trichloropropane	448.4	10.0	ug/L	503	ND	89.1	62-135			
trans-1,4-Dichloro-2-butene	1015	50.0	ug/L	1000	ND	102	50-120			
1,1,2,2-Tetrachloroethane	555.1	10.0	ug/L	501	ND	111	63-126			
1,4-Dichlorobenzene	520.9	10.0	ug/L	501	ND	104	72-119			
1,2-Dichlorobenzene	517.3	10.0	ug/L	501	ND	103	71-117			
1,2-Dibromo-3-chloropropane	465.5	50.0	ug/L	501	ND	92.9	49-134			
Surrogate: Dibromofluoromethane	545		ug/L	502		109	57-134			
Surrogate: Dibromofluoromethane	545		ug/L	502		109	75-136			
Surrogate: 1,2-Dichloroethane-d4	550		ug/L	501		110	53-140			
Surrogate: 1,2-Dichloroethane-d4	550		ug/L	501		110	61-142			
Surrogate: Toluene-d8	513		ug/L	504		102	86-114			
Surrogate: Toluene-d8	513		ug/L	504		102	82-121			
Surrogate: 4-Bromofluorobenzene	483		ug/L	501		96.3	78-121			
Surrogate: 4-Bromofluorobenzene	483		ug/L	501		96.3	80-116			
Matrix Spike Dup (1ID0340-MSD1)	Source: 1ID0773-01			Prepared: 04/07/25 00:00 Analyzed: 04/07/25 20:39						

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0340 - EPA 5030B - EPA 8260D										
Matrix Spike Dup (1ID0340-MSD1)		Source: 1ID0773-01		Prepared: 04/07/25 00:00 Analyzed: 04/07/25 20:39						
Chloromethane	313.2	10.0	ug/L	303	ND	103	61-152	1.71	26	
Vinyl Chloride	317.9	10.0	ug/L	302	ND	105	66-149	3.95	23	
Bromomethane	304.0	10.0	ug/L	301	ND	101	43-171	1.76	29	
Chloroethane	318.2	10.0	ug/L	303	ND	105	69-148	3.55	25	
Trichlorofluoromethane	318.0	10.0	ug/L	303	ND	105	62-163	7.13	25	
1,1-Dichloroethylene	592.4	10.0	ug/L	501	ND	118	70-148	5.36	22	
Acetone	1166	100	ug/L	1000	ND	117	45-173	2.35	30	
Methyl Iodide	1060	10.0	ug/L	1000	ND	106	62-167	1.80	24	
Carbon Disulfide	1093	10.0	ug/L	1000	ND	109	71-163	5.29	22	
Methylene Chloride	506.1	50.0	ug/L	501	ND	101	69-140	4.12	19	
Acrylonitrile	526.8	50.0	ug/L	502	ND	105	38-147	1.88	30	
trans-1,2-Dichloroethylene	576.5	10.0	ug/L	501	ND	115	69-144	4.08	22	
1,1-Dichloroethane	564.0	10.0	ug/L	501	10.03	111	70-138	5.21	20	
Vinyl Acetate	1703	50.0	ug/L	1400	ND	122	58-142	2.43	24	
cis-1,2-Dichloroethylene	561.7	10.0	ug/L	504	15.74	108	68-151	1.80	22	
2-Butanone (MEK)	1139	100	ug/L	1000	ND	114	50-160	4.51	23	
Bromochloromethane	556.1	10.0	ug/L	504	ND	110	65-143	1.69	22	
Chloroform	554.5	10.0	ug/L	501	ND	111	71-143	2.26	21	
1,1,1-Trichloroethane	584.1	10.0	ug/L	501	ND	117	63-133	3.83	23	
Carbon Tetrachloride	576.2	10.0	ug/L	501	ND	115	63-142	4.51	22	
Benzene	505.2	10.0	ug/L	504	ND	100	69-133	1.00	18	
1,2-Dichloroethane	532.9	10.0	ug/L	501	ND	106	63-138	1.42	20	
Trichloroethylene	514.8	10.0	ug/L	501	ND	103	71-133	2.93	23	
1,2-Dichloropropane	518.5	10.0	ug/L	501	ND	104	69-132	0.250	20	
Dibromomethane	531.8	10.0	ug/L	504	ND	106	70-147	0.749	22	
Bromodichloromethane	546.0	10.0	ug/L	501	ND	109	67-130	2.34	21	
cis-1,3-Dichloropropene	503.2	10.0	ug/L	501	ND	100	61-126	2.43	21	
4-Methyl-2-pentanone (MIBK)	1113	50.0	ug/L	1000	ND	111	55-147	1.47	23	
Toluene	563.9	10.0	ug/L	505	ND	112	71-133	0.407	19	
trans-1,3-Dichloropropene	500.9	10.0	ug/L	501	ND	100	63-124	0.842	21	
1,1,2-Trichloroethane	496.8	10.0	ug/L	501	ND	99.2	69-133	0.262	19	
Tetrachloroethylene	509.9	10.0	ug/L	501	ND	102	70-124	2.98	24	
2-Hexanone (MBK)	1108	50.0	ug/L	1000	ND	111	53-141	2.34	24	
Dibromochloromethane	507.0	10.0	ug/L	501	ND	101	74-122	3.07	21	
1,2-Dibromoethane	527.6	10.0	ug/L	502	ND	105	66-127	1.66	23	
Chlorobenzene	488.9	10.0	ug/L	501	ND	97.6	76-116	2.88	21	
1,1,1,2-Tetrachloroethane	485.0	10.0	ug/L	503	ND	96.3	77-121	2.87	25	
Ethylbenzene	534.5	10.0	ug/L	502	ND	107	73-124	3.49	20	
Xylenes, total	1587	20.0	ug/L	1510	ND	105	75-123	3.03	20	
Styrene	541.1	10.0	ug/L	504	ND	107	70-120	2.19	23	
Bromoform	501.6	10.0	ug/L	501	ND	100	70-124	0.477	22	
1,2,3-Trichloropropane	469.1	10.0	ug/L	503	ND	93.2	62-135	4.51	28	
trans-1,4-Dichloro-2-butene	948.8	50.0	ug/L	1000	ND	94.9	50-120	6.78	26	

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CERTIFICATE OF ANALYSIS

11D0774

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11D0340 - EPA 5030B - EPA 8260D										
Matrix Spike Dup (11D0340-MSD1)	Source: 11D0773-01			Prepared: 04/07/25 00:00 Analyzed: 04/07/25 20:39						
1,1,2,2-Tetrachloroethane	506.5	10.0	ug/L	501	ND	101	63-126	9.16	24	
1,4-Dichlorobenzene	479.3	10.0	ug/L	501	ND	95.6	72-119	8.32	24	
1,2-Dichlorobenzene	470.6	10.0	ug/L	501	ND	93.9	71-117	9.45	24	
1,2-Dibromo-3-chloropropane	429.1	50.0	ug/L	501	ND	85.6	49-134	8.14	28	
Surrogate: Dibromofluoromethane	539		ug/L	502		107	57-134			
Surrogate: Dibromofluoromethane	539		ug/L	502		107	75-136			
Surrogate: 1,2-Dichloroethane-d4	525		ug/L	501		105	53-140			
Surrogate: 1,2-Dichloroethane-d4	525		ug/L	501		105	61-142			
Surrogate: Toluene-d8	519		ug/L	504		103	86-114			
Surrogate: Toluene-d8	519		ug/L	504		103	82-121			
Surrogate: 4-Bromofluorobenzene	496		ug/L	501		99.0	78-121			
Surrogate: 4-Bromofluorobenzene	496		ug/L	501		99.0	80-116			

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11D0775 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Blank (11D0775-BLK2)	Prepared: 04/17/25 16:07 Analyzed: 06/18/25 17:13									
Antimony, total	<0.0010	0.0010	mg/L							
Arsenic, total	<0.0020	0.0020	mg/L							
Barium, total	<0.0010	0.0010	mg/L							
Beryllium, total	<0.0005	0.0005	mg/L							
Cadmium, total	<0.0002	0.0002	mg/L							
Chromium, total	<0.0010	0.0010	mg/L							B
Cobalt, total	<0.0005	0.0005	mg/L							
Copper, total	<0.0050	0.0050	mg/L							
Lead, total	<0.0010	0.0010	mg/L							
Nickel, total	<0.0050	0.0050	mg/L							
Selenium, total	<0.0020	0.0020	mg/L							
Silver, total	<0.0050	0.0050	mg/L							
Thallium, total	<0.0005	0.0005	mg/L							
Vanadium, total	<0.0020	0.0020	mg/L							
Zinc, total	<0.0050	0.0050	mg/L							

LCS (11D0775-BS2)	Prepared: 04/17/25 16:07 Analyzed: 06/18/25 17:16									
Antimony, total	0.113	0.0010	mg/L	0.100		113	80-120			
Arsenic, total	0.0949	0.0020	mg/L	0.100		94.9	80-120			
Barium, total	0.114	0.0010	mg/L	0.100		114	80-120			
Beryllium, total	0.108	0.0005	mg/L	0.100		108	80-120			
Cadmium, total	0.102	0.0002	mg/L	0.100		102	80-120			
Chromium, total	0.118	0.0010	mg/L	0.100		118	80-120			
Cobalt, total	0.116	0.0005	mg/L	0.100		116	80-120			
Copper, total	0.0915	0.0050	mg/L	0.100		91.5	80-120			
Lead, total	0.103	0.0010	mg/L	0.100		103	80-120			



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1ID0774

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0775 - EPA 3005A Total Recoverable Metals - EPA 6020A									
LCS (1ID0775-BS2) Prepared: 04/17/25 16:07 Analyzed: 06/18/25 17:16									
Nickel, total	0.0890	0.0050	mg/L	0.100		89.0	80-120		
Selenium, total	0.0986	0.0020	mg/L	0.100		98.6	80-120		
Silver, total	0.109	0.0050	mg/L	0.100		109	80-120		
Thallium, total	0.107	0.0005	mg/L	0.100		107	80-120		
Vanadium, total	0.121	0.0020	mg/L	0.100		121	80-120		Q1
Zinc, total	0.0939	0.0050	mg/L	0.100		93.9	80-120		
Matrix Spike (1ID0775-MS2) Source: 3IC0116-01RE1 Prepared: 04/17/25 16:07 Analyzed: 06/18/25 18:03									
Antimony, total	0.114	0.0010	mg/L	0.100	ND	114	75-125		
Arsenic, total	0.100	0.0020	mg/L	0.100	0.0073	92.7	75-125		
Barium, total	0.945	0.0010	mg/L	0.100	0.837	108	75-125		
Beryllium, total	0.120	0.0005	mg/L	0.100	ND	120	75-125		
Cadmium, total	0.101	0.0002	mg/L	0.100	0.0001	101	75-125		
Chromium, total	0.110	0.0010	mg/L	0.100	0.0016	108	75-125		
Cobalt, total	0.110	0.0005	mg/L	0.100	0.0054	104	75-125		
Copper, total	0.0869	0.0050	mg/L	0.100	0.0042	82.7	75-125		
Lead, total	0.101	0.0010	mg/L	0.100	ND	101	75-125		
Nickel, total	0.0968	0.0050	mg/L	0.100	0.0155	81.3	75-125		
Selenium, total	0.0959	0.0020	mg/L	0.100	ND	95.9	75-125		
Silver, total	0.111	0.0050	mg/L	0.100	ND	111	75-125		
Thallium, total	0.110	0.0005	mg/L	0.100	0.00004	110	75-125		
Vanadium, total	0.116	0.0020	mg/L	0.100	0.0003	116	75-125		
Zinc, total	0.0964	0.0050	mg/L	0.100	0.0096	86.8	75-125		
Matrix Spike Dup (1ID0775-MSD2) Source: 3IC0116-01RE1 Prepared: 04/17/25 16:07 Analyzed: 06/18/25 18:03									
Antimony, total	0.116	0.0010	mg/L	0.100	ND	116	75-125	1.83	20
Arsenic, total	0.101	0.0020	mg/L	0.100	0.0073	93.7	75-125	1.00	20
Barium, total	0.966	0.0010	mg/L	0.100	0.837	129	75-125	2.21	20 M6
Beryllium, total	0.120	0.0005	mg/L	0.100	ND	120	75-125	0.417	20
Cadmium, total	0.102	0.0002	mg/L	0.100	0.0001	102	75-125	1.48	20
Chromium, total	0.108	0.0010	mg/L	0.100	0.0016	107	75-125	1.05	20
Cobalt, total	0.109	0.0005	mg/L	0.100	0.0054	103	75-125	1.00	20
Copper, total	0.0875	0.0050	mg/L	0.100	0.0042	83.3	75-125	0.675	20
Lead, total	0.103	0.0010	mg/L	0.100	ND	103	75-125	1.92	20
Nickel, total	0.0976	0.0050	mg/L	0.100	0.0155	82.1	75-125	0.845	20
Selenium, total	0.0976	0.0020	mg/L	0.100	ND	97.6	75-125	1.75	20
Silver, total	0.107	0.0050	mg/L	0.100	ND	107	75-125	3.03	20
Thallium, total	0.109	0.0005	mg/L	0.100	0.00004	109	75-125	1.16	20
Vanadium, total	0.115	0.0020	mg/L	0.100	0.0003	115	75-125	1.22	20
Zinc, total	0.0966	0.0050	mg/L	0.100	0.0096	87.0	75-125	0.167	20
Post Spike (1ID0775-PS2) Source: 3IC0116-01RE1 Prepared: 04/17/25 16:07 Analyzed: 06/19/25 09:40									
Antimony, total	0.0210		mg/L	0.0200	0.0003	103	80-120		
Arsenic, total	0.0261		mg/L	0.0200	0.0072	94.6	80-120		
Barium, total	0.818		mg/L	0.0200	0.820	NR	80-120		M6
Beryllium, total	0.0237		mg/L	0.0200	0.00001	118	80-120		

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CERTIFICATE OF ANALYSIS

1ID0774

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1ID0775 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Post Spike (1ID0775-PS2) Source: 3IC0116-01RE1 Prepared: 04/17/25 16:07 Analyzed: 06/19/25 09:40										
Cadmium, total	0.0198		mg/L	0.0200	0.0001	98.6	80-120			
Chromium, total	0.0226		mg/L	0.0200	0.0016	105	80-120			
Cobalt, total	0.0246		mg/L	0.0200	0.0053	96.7	80-120			
Copper, total	0.0207		mg/L	0.0200	0.0042	82.9	80-120			
Lead, total	0.0193		mg/L	0.0200	0.0001	95.7	80-120			
Nickel, total	0.0311		mg/L	0.0200	0.0152	79.4	80-120			M2
Selenium, total	0.0195		mg/L	0.0200	0.0004	95.3	80-120			
Silver, total	0.0203		mg/L	0.0200	0.000008	101	80-120			
Thallium, total	0.0197		mg/L	0.0200	0.00003	98.5	80-120			
Vanadium, total	0.0220		mg/L	0.0200	0.0003	109	80-120			
Zinc, total	0.0271		mg/L	0.0200	0.0094	88.3	80-120			

Definitions

B:	The target analyte was detected in the blank at or above the method acceptance criteria.
M2:	Matrix spike recovery is below acceptance limits.
M6:	Matrix spike recovery is outside of acceptance limits. The analyte concentration is greater than 4X the spiking level.
Q1:	LCS recovery is above acceptance limits. The reported value is estimated.
R1:	Duplicate RPD is outside acceptance criteria.
RL:	Reporting Limit
RPD:	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 0.2°C

Cooler Inspection Checklist

Custody Seals	No	Containers Intact	Yes
COC/Labels Agree	Yes	Preservation Confirmed	No
Received On Ice	Yes		

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.

Reviewed and Approved By:

Heather Murphy
Customer Relationship Specialist
heather.murphy@microbac.com
06/20/25 08:45



CHAIN OF CUSTODY

600 East 17th Street South
Newton, IA 50208
641-792-8451

1 I D O 7 7 4

HLW Engineering
PM: Heather Murphy

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SITE INFORMATION

Sampler: TODD WHIPPLE
Project: Jackson Co. Landfill-New Regs
6040

REPORT TO

Todd Whipple
HLW Engineering
204 West Broad St
Story City, IA 50248

INVOICE TO

Frank Frieberg
Waste Authority of Jackson County
201 W Platt St
Maquoketa, IA 52060

SPECIAL INSTRUCTIONS

None

Turn Around Time

☐ Standard ☐ RUSH, need by ___/___/___

LAB USE ONLY

Work Order ID 0774
Temperature 0.2
Turn-Cooler: No☐ Custody Seal
☒ Containers Intact
☒ COC/Labels Agree
☒ Preservation Confirmed
☒ Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-001	MW-10	Aqueous	GRAB	<u>4/3/25</u>	<u>15:02</u>	<u>1</u>	landfill-app1-metals-6020	<u>01</u>
-001	MW-11	Aqueous	GRAB	<u>4/3/25</u>	<u>15:28</u>	<u>7</u>	landfill-app1-voc-group landfill-app1-metals-6020	<u>02</u>
-001	MW-12	Aqueous	GRAB	<u>4/3/25</u>	<u>15:39</u>	<u>7</u>	landfill-app1-voc-group landfill-app1-metals-6020	<u>03</u>
-001	MW-13	Aqueous	GRAB	<u>4/3/25</u>	<u>16:02</u>	<u>1</u>	landfill-app1-metals-6020	<u>04</u>
-001	MW-14	Aqueous	GRAB	<u>4/3/25</u>	<u>16:31</u>	<u>1</u>	landfill-app1-metals-6020	<u>05</u>
-001	MW-15	Aqueous	GRAB	<u>4/3/25</u>	<u>16:22</u>	<u>1</u>	landfill-app1-metals-6020	<u>06</u>
-001	MW-17	Aqueous	GRAB	<u>4/3/25</u>	<u>14:25</u>	<u>7</u>	landfill-app1-voc-group landfill-app1-metals-6020	<u>07</u>

Relinquished By Heather MurphyDate/Time 4/4/25Relinquished By Heather MurphyDate/Time 4/4/25 10:33

Received By

Date/Time

Received for Lab By

Date/Time

Original - Lab Copy Yellow - Sampler Copy

Remarks:



600 East 17th Street So
Newton, IA 50208
641-792-8451

CHAIN OF CUSTODY RECORD



1 I D O 7 7 4

HLW Engineering
PM: Heather Murphy

Page 2 of

Printed: 3/20/2025 11:31:06A

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Page 24 of 24

SITE INFORMATION

Sampler: TODD WHIPPLE

Project: Jackson Co. Landfill-New Regs
6040

SPECIAL INSTRUCTIONS

None

Turn Around Time

☐ Standard ☐ RUSH, need by ___/___/___

REPORT TO

Todd Whipple
HLW Engineering
204 West Broad St
Story City, IA 50248

INVOICE TO

Frank Frieberg
Waste Authority of Jackson County
201 W Platt St
Maquoketa, IA 52060

LAB USE ONLY

Work Order 11D0774

Temperature 0.2

Turn-Cooler: No

- ☐ Custody Seal
- ☒ Containers Intact
- ☒ COC/Labels Agree
- ☒ Preservation Confirmed
- ☒ Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-001	MW-19 <u>DRY</u>	Aqueous	GRAB	<u>4/3/25</u>	<u>—</u>	<u>0</u>	Indfill-app1-voc-group Indfill-app1-metals-6020	<u>—</u>
-001	MW-20 <u>DRY</u>	Aqueous	GRAB	<u>4/3/25</u>	<u>—</u>	<u>0</u>	Indfill-app1-voc-group Indfill-app1-metals-6020	<u>—</u>
-001	Field Duplicate	Aqueous	GRAB	<u>4/3/25</u>	<u>✓</u>	<u>1</u>	Indfill-app1-voc-group Indfill-app1-metals-6020	<u>08</u>

Relinquished By Todd Whipple Date/Time 4/4/25

Received By _____ Date/Time _____

Relinquished By _____ Date/Time _____
Schabo 4/4/25 10:33

Received for Lab By _____ Date/Time _____

Original - Lab Copy Yellow - Sampler Copy

Remarks:



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1IJ1463

Project Description

6040

For:

Todd Whipple

HLW Engineering

204 West Broad St

Story City, IA 50248

Heather Murphy

Customer Relationship Specialist

Wednesday, October 29, 2025

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac Laboratories, Inc., Newton. If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed above.

I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1IJ1463

HLW Engineering

Todd Whipple
204 West Broad St
Story City, IA 50248

Project Name: 6040

Project / PO Number: N/A
Received: 10/15/2025
Reported: 10/29/2025

Sample Summary Report

<u>Sample Name</u>	<u>Laboratory ID</u>	<u>Client Matrix</u>	<u>Sample Type</u>	<u>Sample Begin</u>	<u>Sample Taken</u>	<u>Lab Received</u>
MW-10	1IJ1463-01	Aqueous	GRAB		10/14/25 08:12	10/15/25 09:30
MW-11	1IJ1463-02	Aqueous	GRAB		10/14/25 07:33	10/15/25 09:30
MW-12	1IJ1463-03	Aqueous	GRAB		10/14/25 07:48	10/15/25 09:30
MW-13	1IJ1463-04	Aqueous	GRAB		10/14/25 07:15	10/15/25 09:30
MW-14	1IJ1463-05	Aqueous	GRAB		10/14/25 06:53	10/15/25 09:30
MW-15	1IJ1463-06	Aqueous	GRAB		10/14/25 07:02	10/15/25 09:30
MW-17	1IJ1463-07	Aqueous	GRAB		10/14/25 08:49	10/15/25 09:30
Field Duplicate	1IJ1463-08	Aqueous	GRAB		10/14/25 00:00	10/15/25 09:30



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1IJ1463

Analytical Testing Parameters

Client Sample ID:	MW-10	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	10/14/2025 8:12
Lab Sample ID:	1IJ1463-01		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2113	RVV
Arsenic	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2113	RVV
Barium	0.0907	0.0010	mg/L		10/20/25 0925	10/20/25 2113	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2113	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2113	RVV
Chromium	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2113	RVV
Cobalt	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2113	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2113	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2113	RVV
Nickel	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2113	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2113	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2113	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2113	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2113	RVV
Zinc	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2113	RVV

Client Sample ID:	MW-11	Collected By:	Whipple, Todd
Sample Matrix:	Aqueous	Collection Date:	10/14/2025 7:33
Lab Sample ID:	1IJ1463-02		

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Vinyl Chloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Bromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Chloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Trichlorofluoromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Acetone	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Methyl Iodide	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Carbon Disulfide	1.1	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Methylene Chloride	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Acrylonitrile	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Vinyl Acetate	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
2-Butanone (MEK)	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Bromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Chloroform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1,1-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-11
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-02

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:33

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Carbon Tetrachloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Benzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Trichloroethylene	1.1	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2-Dichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Dibromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Bromodichloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Toluene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1,2-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Tetrachloroethylene	2.1	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
2-Hexanone (MBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Dibromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2-Dibromoethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Chlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Ethylbenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Xylenes, total	<2.0	2.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Styrene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Bromoform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2,3-Trichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,4-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1711	RAF
Surrogate: Dibromofluoromethane	99.1	Limit: 57-128	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: Dibromofluoromethane	91.6	Limit: 75-136	% Rec		10/23/25 0000	10/23/25 1121	RAF
Surrogate: Dibromofluoromethane	99.1	Limit: 75-136	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: 1,2-Dichloroethane-d4	114	Limit: 61-142	% Rec		10/23/25 0000	10/23/25 1121	RAF
Surrogate: 1,2-Dichloroethane-d4	121	Limit: 49-135	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: 1,2-Dichloroethane-d4	121	Limit: 61-142	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: Toluene-d8	104	Limit: 82-116	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: Toluene-d8	104	Limit: 82-121	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: Toluene-d8	102	Limit: 82-121	% Rec		10/23/25 0000	10/23/25 1121	RAF
Surrogate: 4-Bromofluorobenzene	101	Limit: 80-116	% Rec		10/23/25 0000	10/23/25 1121	RAF
Surrogate: 4-Bromofluorobenzene	97.9	Limit: 77-114	% Rec		10/20/25 0000	10/20/25 1711	RAF
Surrogate: 4-Bromofluorobenzene	97.9	Limit: 80-116	% Rec		10/20/25 0000	10/20/25 1711	RAF

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2115	RVV

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-11
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-02

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:33

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Arsenic	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2115	RVV
Barium	0.104	0.0010	mg/L		10/20/25 0925	10/20/25 2115	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2115	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2115	RVV
Chromium	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2115	RVV
Cobalt	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2115	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2115	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2115	RVV
Nickel	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2115	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2115	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2115	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2115	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2115	RVV
Zinc	0.0108	0.0050	mg/L		10/20/25 0925	10/20/25 2115	RVV

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-12
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-03

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:48

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Vinyl Chloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Bromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Chloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Trichlorofluoromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Acetone	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Methyl Iodide	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Carbon Disulfide	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Methylene Chloride	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Acrylonitrile	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Vinyl Acetate	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
2-Butanone (MEK)	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Bromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Chloroform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1,1-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Carbon Tetrachloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Benzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Trichloroethylene	3.1	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2-Dichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Dibromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Bromodichloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Toluene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1,2-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Tetrachloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
2-Hexanone (MBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Dibromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2-Dibromoethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Chlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Ethylbenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Xylenes, total	<2.0	2.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Styrene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Bromoform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2,3-Trichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-12
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-03

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:48

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,4-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1734	RAF
Surrogate: Dibromofluoromethane	97.2	Limit: 75-136	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: Dibromofluoromethane	97.2	Limit: 57-128	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: 1,2-Dichloroethane-d4	119	Limit: 61-142	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: 1,2-Dichloroethane-d4	119	Limit: 49-135	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: Toluene-d8	104	Limit: 82-121	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: Toluene-d8	104	Limit: 82-116	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: 4-Bromofluorobenzene	101	Limit: 77-114	% Rec		10/20/25 0000	10/20/25 1734	RAF
Surrogate: 4-Bromofluorobenzene	101	Limit: 80-116	% Rec		10/20/25 0000	10/20/25 1734	RAF

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	0.0016	0.0010	mg/L		10/20/25 0925	10/20/25 2118	RVV
Arsenic	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2118	RVV
Barium	0.330	0.0010	mg/L		10/20/25 0925	10/20/25 2118	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2118	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2118	RVV
Chromium	0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2118	RVV
Cobalt	0.0011	0.0005	mg/L		10/20/25 0925	10/20/25 2118	RVV
Copper	0.0118	0.0050	mg/L		10/20/25 0925	10/20/25 2118	RVV
Lead	0.0026	0.0010	mg/L		10/20/25 0925	10/22/25 1805	RVV
Nickel	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2118	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2118	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2118	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2118	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2118	RVV
Zinc	0.0244	0.0050	mg/L		10/20/25 0925	10/20/25 2118	RVV



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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-13
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-04

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:15

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2121	RVV
Arsenic	0.0102	0.0020	mg/L		10/20/25 0925	10/20/25 2121	RVV
Barium	0.562	0.0010	mg/L		10/20/25 0925	10/20/25 2121	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2121	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2121	RVV
Chromium	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2121	RVV
Cobalt	0.0082	0.0005	mg/L		10/20/25 0925	10/20/25 2121	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2121	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2121	RVV
Nickel	0.0055	0.0050	mg/L		10/20/25 0925	10/20/25 2121	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2121	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2121	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2121	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2121	RVV
Zinc	0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2121	RVV

Client Sample ID: MW-14
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-05

Collected By: Whipple, Todd
Collection Date: 10/14/2025 6:53

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2123	RVV
Arsenic	0.0050	0.0020	mg/L		10/20/25 0925	10/20/25 2123	RVV
Barium	0.849	0.0010	mg/L		10/20/25 0925	10/20/25 2123	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2123	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2123	RVV
Chromium	0.0011	0.0010	mg/L		10/20/25 0925	10/20/25 2123	RVV
Cobalt	0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2123	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2123	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2123	RVV
Nickel	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2123	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2123	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2123	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2123	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2123	RVV
Zinc	0.0090	0.0050	mg/L		10/20/25 0925	10/20/25 2123	RVV

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-15
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-06

Collected By: Whipple, Todd
Collection Date: 10/14/2025 7:02

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2126	RVV
Arsenic	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2126	RVV
Barium	0.338	0.0010	mg/L		10/20/25 0925	10/20/25 2126	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2126	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2126	RVV
Chromium	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2126	RVV
Cobalt	0.0078	0.0005	mg/L		10/20/25 0925	10/20/25 2126	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2126	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2126	RVV
Nickel	0.0110	0.0050	mg/L		10/20/25 0925	10/20/25 2126	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2126	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2126	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2126	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2126	RVV
Zinc	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2126	RVV

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-17
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-07

Collected By: Whipple, Todd
Collection Date: 10/14/2025 8:49

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260D							
Chloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Vinyl Chloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Bromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Chloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Trichlorofluoromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Acetone	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Methyl Iodide	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Carbon Disulfide	1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Methylene Chloride	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Acrylonitrile	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Vinyl Acetate	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
2-Butanone (MEK)	<10.0	10.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Bromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Chloroform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1,1-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Carbon Tetrachloride	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Benzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2-Dichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Trichloroethylene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2-Dichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Dibromomethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Bromodichloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
cis-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Toluene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
trans-1,3-Dichloropropene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1,2-Trichloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Tetrachloroethylene	1.3	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
2-Hexanone (MBK)	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Dibromochloromethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2-Dibromoethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Chlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Ethylbenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Xylenes, total	<2.0	2.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Styrene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Bromoform	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2,3-Trichloropropane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF

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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: MW-17
Sample Matrix: Aqueous
Lab Sample ID: 1IJ1463-07

Collected By: Whipple, Todd
Collection Date: 10/14/2025 8:49

Determination of Volatile Organic Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,4-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2-Dichlorobenzene	<1.0	1.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L		10/20/25 0000	10/20/25 1757	RAF
Surrogate: Dibromofluoromethane	95.5	Limit: 75-136	% Rec		10/23/25 0000	10/23/25 1144	RAF
Surrogate: Dibromofluoromethane	100	Limit: 57-128	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: Dibromofluoromethane	100	Limit: 75-136	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: 1,2-Dichloroethane-d4	118	Limit: 49-135	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: 1,2-Dichloroethane-d4	116	Limit: 61-142	% Rec		10/23/25 0000	10/23/25 1144	RAF
Surrogate: 1,2-Dichloroethane-d4	118	Limit: 61-142	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: Toluene-d8	103	Limit: 82-116	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: Toluene-d8	104	Limit: 82-121	% Rec		10/23/25 0000	10/23/25 1144	RAF
Surrogate: Toluene-d8	103	Limit: 82-121	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: 4-Bromofluorobenzene	103	Limit: 80-116	% Rec		10/23/25 0000	10/23/25 1144	RAF
Surrogate: 4-Bromofluorobenzene	100	Limit: 77-114	% Rec		10/20/25 0000	10/20/25 1757	RAF
Surrogate: 4-Bromofluorobenzene	100	Limit: 80-116	% Rec		10/20/25 0000	10/20/25 1757	RAF

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2128	RVV
Arsenic	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2128	RVV
Barium	0.221	0.0010	mg/L		10/20/25 0925	10/20/25 2128	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2128	RVV
Cadmium	0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2128	RVV
Chromium	0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2128	RVV
Cobalt	0.0146	0.0005	mg/L		10/20/25 0925	10/20/25 2128	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2128	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2128	RVV
Nickel	0.0193	0.0050	mg/L		10/20/25 0925	10/20/25 2128	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2128	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2128	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2128	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2128	RVV
Zinc	0.0125	0.0050	mg/L		10/20/25 0925	10/20/25 2128	RVV



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CERTIFICATE OF ANALYSIS

1IJ1463

Client Sample ID: Field Duplicate

Sample Matrix: Aqueous

Lab Sample ID: 1IJ1463-08

Collected By: Whipple, Todd

Collection Date: 10/14/2025

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2136	RVV
Arsenic	0.0049	0.0020	mg/L		10/20/25 0925	10/20/25 2136	RVV
Barium	0.823	0.0010	mg/L		10/20/25 0925	10/20/25 2136	RVV
Beryllium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2136	RVV
Cadmium	<0.0002	0.0002	mg/L		10/20/25 0925	10/20/25 2136	RVV
Chromium	0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2136	RVV
Cobalt	0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2136	RVV
Copper	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2136	RVV
Lead	<0.0010	0.0010	mg/L		10/20/25 0925	10/20/25 2136	RVV
Nickel	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2136	RVV
Selenium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2136	RVV
Silver	<0.0050	0.0050	mg/L		10/20/25 0925	10/20/25 2136	RVV
Thallium	<0.0005	0.0005	mg/L		10/20/25 0925	10/20/25 2136	RVV
Vanadium	<0.0020	0.0020	mg/L		10/20/25 0925	10/20/25 2136	RVV
Zinc	0.0081	0.0050	mg/L		10/20/25 0925	10/20/25 2136	RVV

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CERTIFICATE OF ANALYSIS

1IJ1463

Batch Log Summary

Method	Batch	Laboratory ID	Client / Source ID
EPA 6020A	1IJ1122	1IJ1122-BLK1	
		1IJ1122-BS1	
		1IJ1122-MS1	1IJ1462-01
		1IJ1122-MSD1	1IJ1462-01
		1IJ1122-PS1	1IJ1462-01
		1IJ1463-01	MW-10
		1IJ1463-02	MW-11
		1IJ1463-03	MW-12
		1IJ1463-04	MW-13
		1IJ1463-05	MW-14
		1IJ1463-06	MW-15
		1IJ1463-07	MW-17
		1IJ1463-08	Field Duplicate
		1IJ1463-03RE1	MW-12
Method	Batch	Laboratory ID	Client / Source ID
EPA 8260D	1IJ1171	1IJ1171-BS1	
		1IJ1171-BSD1	
		1IJ1171-BLK1	
		1IJ1463-02	MW-11
		1IJ1463-03	MW-12
		1IJ1463-07	MW-17
		1IJ1171-MS1	1IJ1462-01
		1IJ1171-MSD1	1IJ1462-01
Method	Batch	Laboratory ID	Client / Source ID
EPA 8260D	1IJ1423	1IJ1423-BLK1	
		1IJ1463-02RE1	MW-11
		1IJ1463-07RE1	MW-17
		1IJ1423-BS1	
		1IJ1423-BSD1	
		1IJ1423-MS1	3IJ0087-07
		1IJ1423-MSD1	3IJ0087-07

Batch Quality Control Summary: Microbac Laboratories, Inc., Newton

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
Blank (1IJ1171-BLK1)				Prepared: 10/20/25 00:00 Analyzed: 10/20/25 11:05						
Chloromethane	<1.0	1.0	ug/L							
Vinyl Chloride	<1.0	1.0	ug/L							
Bromomethane	<1.0	1.0	ug/L							
Chloroethane	<1.0	1.0	ug/L							
Trichlorofluoromethane	<1.0	1.0	ug/L							
1,1-Dichloroethylene	<1.0	1.0	ug/L							
Acetone	<10.0	10.0	ug/L							
Methyl Iodide	<1.0	1.0	ug/L							

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
Blank (1IJ1171-BLK1)				Prepared: 10/20/25 00:00 Analyzed: 10/20/25 11:05						
Carbon Disulfide	<1.0	1.0	ug/L							
Methylene Chloride	<5.0	5.0	ug/L							
Acrylonitrile	<5.0	5.0	ug/L							
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L							
1,1-Dichloroethane	<1.0	1.0	ug/L							
Vinyl Acetate	<5.0	5.0	ug/L							
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L							
2-Butanone (MEK)	<10.0	10.0	ug/L							
Bromochloromethane	<1.0	1.0	ug/L							
Chloroform	<1.0	1.0	ug/L							
1,1,1-Trichloroethane	<1.0	1.0	ug/L							
Carbon Tetrachloride	<1.0	1.0	ug/L							
Benzene	<1.0	1.0	ug/L							
1,2-Dichloroethane	<1.0	1.0	ug/L							
Trichloroethylene	<1.0	1.0	ug/L							
1,2-Dichloropropane	<1.0	1.0	ug/L							
Dibromomethane	<1.0	1.0	ug/L							
Bromodichloromethane	<1.0	1.0	ug/L							
cis-1,3-Dichloropropene	<1.0	1.0	ug/L							
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L							
Toluene	<1.0	1.0	ug/L							
trans-1,3-Dichloropropene	<1.0	1.0	ug/L							
1,1,2-Trichloroethane	<1.0	1.0	ug/L							
Tetrachloroethylene	<1.0	1.0	ug/L							
2-Hexanone (MBK)	<5.0	5.0	ug/L							
Dibromochloromethane	<1.0	1.0	ug/L							
1,2-Dibromoethane	<1.0	1.0	ug/L							
Chlorobenzene	<1.0	1.0	ug/L							
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L							
Ethylbenzene	<1.0	1.0	ug/L							
Xylenes, total	<2.0	2.0	ug/L							
Styrene	<1.0	1.0	ug/L							
Bromoform	<1.0	1.0	ug/L							
1,2,3-Trichloropropane	<1.0	1.0	ug/L							
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L							
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L							
1,4-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L							
Surrogate: Dibromofluoromethane	47.7		ug/L	50.2		95.1	57-128			
Surrogate: Dibromofluoromethane	47.7		ug/L	50.2		95.1	75-136			
Surrogate: 1,2-Dichloroethane-d4	58.2		ug/L	50.4		116	49-135			
Surrogate: 1,2-Dichloroethane-d4	58.2		ug/L	50.4		116	61-142			

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
Blank (1IJ1171-BLK1)										
Prepared: 10/20/25 00:00 Analyzed: 10/20/25 11:05										
Surrogate: Toluene-d8	51.0		ug/L	50.5		101	82-116			
Surrogate: Toluene-d8	51.0		ug/L	50.5		101	82-121			
Surrogate: 4-Bromofluorobenzene	51.4		ug/L	50.2		102	77-114			
Surrogate: 4-Bromofluorobenzene	51.4		ug/L	50.2		102	80-116			
LCS (1IJ1171-BS1)										
Prepared: 10/20/25 00:00 Analyzed: 10/20/25 09:56										
Chloromethane	27.64	1.0	ug/L	30.3		91.2	63-155			
Vinyl Chloride	31.30	1.0	ug/L	30.2		103	70-154			
Bromomethane	24.06	1.0	ug/L	30.1		79.9	52-176			
Chloroethane	26.47	1.0	ug/L	30.3		87.3	72-148			
Trichlorofluoromethane	30.53	1.0	ug/L	30.3		101	70-152			
1,1-Dichloroethylene	60.39	1.0	ug/L	50.1		120	70-148			
Acetone	116.4	10.0	ug/L	100		116	43-172			
Methyl Iodide	110.4	1.0	ug/L	100		110	69-170			
Carbon Disulfide	105.4	1.0	ug/L	100		105	72-162			
Methylene Chloride	48.67	5.0	ug/L	50.1		97.1	68-142			
Acrylonitrile	56.52	5.0	ug/L	50.4		112	33-163			
trans-1,2-Dichloroethylene	62.15	1.0	ug/L	50.1		124	66-148			
1,1-Dichloroethane	60.62	1.0	ug/L	50.1		121	66-143			
Vinyl Acetate	150.2	5.0	ug/L	142		105	43-153			
cis-1,2-Dichloroethylene	52.34	1.0	ug/L	50.4		104	71-149			
2-Butanone (MEK)	123.8	10.0	ug/L	100		124	52-159			
Bromochloromethane	61.40	1.0	ug/L	50.4		122	69-143			
Chloroform	53.34	1.0	ug/L	50.1		107	69-144			
1,1,1-Trichloroethane	55.45	1.0	ug/L	50.1		111	62-129			
Carbon Tetrachloride	56.87	1.0	ug/L	50.1		114	63-141			
Benzene	56.47	1.0	ug/L	50.4		112	71-134			
1,2-Dichloroethane	64.01	1.0	ug/L	50.1		128	72-132			
Trichloroethylene	57.57	1.0	ug/L	50.1		115	71-135			
1,2-Dichloropropane	57.64	1.0	ug/L	50.1		115	69-136			
Dibromomethane	47.83	1.0	ug/L	50.4		95.0	73-147			
Bromodichloromethane	56.79	1.0	ug/L	50.1		113	68-129			
cis-1,3-Dichloropropene	47.10	1.0	ug/L	50.1		94.0	65-134			
4-Methyl-2-pentanone (MIBK)	124.0	5.0	ug/L	100		124	58-147			
Toluene	56.27	1.0	ug/L	50.5		111	72-133			
trans-1,3-Dichloropropene	55.07	1.0	ug/L	50.1		110	67-130			
1,1,2-Trichloroethane	54.61	1.0	ug/L	50.1		109	69-135			
Tetrachloroethylene	54.73	1.0	ug/L	50.1		109	69-130			
2-Hexanone (MBK)	124.4	5.0	ug/L	100		124	55-144			
Dibromochloromethane	45.14	1.0	ug/L	50.1		90.2	73-127			
1,2-Dibromoethane	50.90	1.0	ug/L	50.2		101	67-132			
Chlorobenzene	52.31	1.0	ug/L	50.1		104	72-123			
1,1,1,2-Tetrachloroethane	49.61	1.0	ug/L	50.3		98.5	73-127			

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
LCS (1IJ1171-BS1) Prepared: 10/20/25 00:00 Analyzed: 10/20/25 09:56										
Ethylbenzene	56.16	1.0	ug/L	50.2		112	71-127			
Xylenes, total	174.7	2.0	ug/L	151		116	74-127			
Styrene	55.04	1.0	ug/L	50.4		109	66-126			
Bromoform	52.11	1.0	ug/L	50.1		104	68-130			
1,2,3-Trichloropropane	53.13	1.0	ug/L	50.3		106	63-136			
trans-1,4-Dichloro-2-butene	118.1	5.0	ug/L	100		118	54-134			
1,1,2,2-Tetrachloroethane	51.31	1.0	ug/L	50.1		102	61-131			
1,4-Dichlorobenzene	50.46	1.0	ug/L	50.1		101	70-129			
1,2-Dichlorobenzene	49.48	1.0	ug/L	50.1		98.8	69-126			
1,2-Dibromo-3-chloropropane	43.55	5.0	ug/L	50.1		86.9	50-143			
Surrogate: Dibromofluoromethane	47.0		ug/L	50.2		93.7	57-128			
Surrogate: Dibromofluoromethane	47.0		ug/L	50.2		93.7	75-136			
Surrogate: 1,2-Dichloroethane-d4	58.5		ug/L	50.4		116	49-135			
Surrogate: 1,2-Dichloroethane-d4	58.5		ug/L	50.4		116	61-142			
Surrogate: Toluene-d8	51.0		ug/L	50.5		101	82-116			
Surrogate: Toluene-d8	51.0		ug/L	50.5		101	82-121			
Surrogate: 4-Bromofluorobenzene	58.1		ug/L	50.2		116	77-114			S1
Surrogate: 4-Bromofluorobenzene	58.1		ug/L	50.2		116	80-116			
LCS Dup (1IJ1171-BS1) Prepared: 10/20/25 00:00 Analyzed: 10/20/25 10:19										
Chloromethane	26.59	1.0	ug/L	30.3		87.7	63-155	3.87	24	
Vinyl Chloride	34.52	1.0	ug/L	30.2		114	70-154	9.78	25	
Bromomethane	24.98	1.0	ug/L	30.1		82.9	52-176	3.75	27	
Chloroethane	24.96	1.0	ug/L	30.3		82.3	72-148	5.87	25	
Trichlorofluoromethane	29.07	1.0	ug/L	30.3		95.9	70-152	4.90	26	
1,1-Dichloroethylene	59.52	1.0	ug/L	50.1		119	70-148	1.45	24	
Acetone	118.1	10.0	ug/L	100		118	43-172	1.44	30	
Methyl Iodide	109.4	1.0	ug/L	100		109	69-170	0.928	30	
Carbon Disulfide	101.4	1.0	ug/L	100		101	72-162	3.86	24	
Methylene Chloride	48.74	5.0	ug/L	50.1		97.3	68-142	0.144	21	
Acrylonitrile	58.58	5.0	ug/L	50.4		116	33-163	3.58	28	
trans-1,2-Dichloroethylene	61.19	1.0	ug/L	50.1		122	66-148	1.56	27	
1,1-Dichloroethane	59.18	1.0	ug/L	50.1		118	66-143	2.40	24	
Vinyl Acetate	149.6	5.0	ug/L	142		105	43-153	0.347	30	
cis-1,2-Dichloroethylene	51.29	1.0	ug/L	50.4		102	71-149	2.03	26	
2-Butanone (MEK)	125.6	10.0	ug/L	100		126	52-159	1.40	27	
Bromochloromethane	61.93	1.0	ug/L	50.4		123	69-143	0.859	23	
Chloroform	53.62	1.0	ug/L	50.1		107	69-144	0.524	23	
1,1,1-Trichloroethane	54.57	1.0	ug/L	50.1		109	62-129	1.60	24	
Carbon Tetrachloride	56.81	1.0	ug/L	50.1		113	63-141	0.106	25	
Benzene	55.83	1.0	ug/L	50.4		111	71-134	1.14	24	
1,2-Dichloroethane	64.74	1.0	ug/L	50.1		129	72-132	1.13	24	
Trichloroethylene	56.68	1.0	ug/L	50.1		113	71-135	1.56	24	
1,2-Dichloropropane	58.62	1.0	ug/L	50.1		117	69-136	1.69	24	

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
LCS Dup (1IJ1171-BSD1)										
Prepared: 10/20/25 00:00 Analyzed: 10/20/25 10:19										
Dibromomethane	48.54	1.0	ug/L	50.4		96.4	73-147	1.47	25	
Bromodichloromethane	56.14	1.0	ug/L	50.1		112	68-129	1.15	22	
cis-1,3-Dichloropropene	47.83	1.0	ug/L	50.1		95.5	65-134	1.54	23	
4-Methyl-2-pentanone (MIBK)	126.9	5.0	ug/L	100		127	58-147	2.31	27	
Toluene	54.94	1.0	ug/L	50.5		109	72-133	2.39	24	
trans-1,3-Dichloropropene	55.65	1.0	ug/L	50.1		111	67-130	1.05	24	
1,1,2-Trichloroethane	54.91	1.0	ug/L	50.1		110	69-135	0.548	23	
Tetrachloroethylene	51.04	1.0	ug/L	50.1		102	69-130	6.98	25	
2-Hexanone (MBK)	122.8	5.0	ug/L	100		123	55-144	1.28	25	
Dibromochloromethane	45.22	1.0	ug/L	50.1		90.3	73-127	0.177	22	
1,2-Dibromoethane	49.24	1.0	ug/L	50.2		98.0	67-132	3.32	24	
Chlorobenzene	50.27	1.0	ug/L	50.1		100	72-123	3.98	23	
1,1,1,2-Tetrachloroethane	49.03	1.0	ug/L	50.3		97.4	73-127	1.18	24	
Ethylbenzene	54.97	1.0	ug/L	50.2		110	71-127	2.14	26	
Xylenes, total	168.7	2.0	ug/L	151		112	74-127	3.50	25	
Styrene	52.63	1.0	ug/L	50.4		104	66-126	4.48	23	
Bromoform	50.22	1.0	ug/L	50.1		100	68-130	3.69	23	
1,2,3-Trichloropropane	53.49	1.0	ug/L	50.3		106	63-136	0.675	24	
trans-1,4-Dichloro-2-butene	115.5	5.0	ug/L	100		116	54-134	2.23	27	
1,1,2,2-Tetrachloroethane	52.64	1.0	ug/L	50.1		105	61-131	2.56	29	
1,4-Dichlorobenzene	51.64	1.0	ug/L	50.1		103	70-129	2.31	24	
1,2-Dichlorobenzene	50.34	1.0	ug/L	50.1		100	69-126	1.72	26	
1,2-Dibromo-3-chloropropane	44.67	5.0	ug/L	50.1		89.1	50-143	2.54	30	
Surrogate: Dibromofluoromethane	47.9		ug/L	50.2		95.4	57-128			
Surrogate: Dibromofluoromethane	47.9		ug/L	50.2		95.4	75-136			
Surrogate: 1,2-Dichloroethane-d4	58.6		ug/L	50.4		116	49-135			
Surrogate: 1,2-Dichloroethane-d4	58.6		ug/L	50.4		116	61-142			
Surrogate: Toluene-d8	51.6		ug/L	50.5		102	82-116			
Surrogate: Toluene-d8	51.6		ug/L	50.5		102	82-121			
Surrogate: 4-Bromofluorobenzene	57.1		ug/L	50.2		114	77-114			
Surrogate: 4-Bromofluorobenzene	57.1		ug/L	50.2		114	80-116			
Matrix Spike (1IJ1171-MS1)										
Source: 1IJ1462-01										
Prepared: 10/20/25 00:00 Analyzed: 10/20/25 19:05										
Chloromethane	272.9	10.0	ug/L	303	ND	90.0	61-152			
Vinyl Chloride	531.5	10.0	ug/L	302	ND	176	66-149			M1
Bromomethane	247.2	10.0	ug/L	301	ND	82.1	43-171			
Chloroethane	284.5	10.0	ug/L	303	ND	93.8	69-148			
Trichlorofluoromethane	318.7	10.0	ug/L	303	ND	105	62-163			
1,1-Dichloroethylene	633.3	10.0	ug/L	501	ND	126	70-148			
Acetone	1527	100	ug/L	1000	ND	153	45-173			
Methyl Iodide	1025	10.0	ug/L	1000	ND	102	62-167			
Carbon Disulfide	1014	10.0	ug/L	1000	ND	101	71-163			
Methylene Chloride	493.8	50.0	ug/L	501	ND	98.6	69-140			
Acrylonitrile	614.3	50.0	ug/L	504	ND	122	32-159			

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CERTIFICATE OF ANALYSIS

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Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11J1171 - EPA 5030B - EPA 8260D										
Matrix Spike (11J1171-MS1)	Source: 11J1462-01			Prepared: 10/20/25 00:00 Analyzed: 10/20/25 19:05						
trans-1,2-Dichloroethylene	632.8	10.0	ug/L	501	ND	126	69-144			
1,1-Dichloroethane	628.5	10.0	ug/L	501	ND	125	70-138			
Vinyl Acetate	1571	50.0	ug/L	1420	ND	110	58-142			
cis-1,2-Dichloroethylene	535.9	10.0	ug/L	504	ND	106	68-151			
2-Butanone (MEK)	1369	100	ug/L	1000	ND	137	50-160			
Bromochloromethane	654.8	10.0	ug/L	504	ND	130	65-143			
Chloroform	553.2	10.0	ug/L	501	ND	110	71-143			
1,1,1-Trichloroethane	574.3	10.0	ug/L	501	ND	115	63-133			
Carbon Tetrachloride	569.7	10.0	ug/L	501	ND	114	63-142			
Benzene	561.6	10.0	ug/L	504	ND	111	69-133			
1,2-Dichloroethane	632.3	10.0	ug/L	501	ND	126	63-138			
Trichloroethylene	559.6	10.0	ug/L	501	ND	112	71-133			
1,2-Dichloropropane	575.5	10.0	ug/L	501	ND	115	69-132			
Dibromomethane	499.5	10.0	ug/L	504	ND	99.2	70-147			
Bromodichloromethane	560.5	10.0	ug/L	501	ND	112	67-130			
cis-1,3-Dichloropropene	459.9	10.0	ug/L	501	ND	91.8	61-126			
4-Methyl-2-pentanone (MIBK)	1259	50.0	ug/L	1000	ND	126	55-147			
Toluene	561.8	10.0	ug/L	505	ND	111	71-133			
trans-1,3-Dichloropropene	531.6	10.0	ug/L	501	ND	106	63-124			
1,1,2-Trichloroethane	542.6	10.0	ug/L	501	ND	108	69-133			
Tetrachloroethylene	521.3	10.0	ug/L	501	ND	104	70-124			
2-Hexanone (MBK)	1209	50.0	ug/L	1000	ND	121	53-141			
Dibromochloromethane	437.4	10.0	ug/L	501	ND	87.4	74-122			
1,2-Dibromoethane	494.6	10.0	ug/L	502	ND	98.5	66-127			
Chlorobenzene	516.9	10.0	ug/L	501	ND	103	76-116			
1,1,1,2-Tetrachloroethane	480.4	10.0	ug/L	503	ND	95.4	77-121			
Ethylbenzene	549.5	10.0	ug/L	502	ND	110	73-124			
Xylenes, total	1733	20.0	ug/L	1510	ND	115	75-123			
Styrene	532.3	10.0	ug/L	504	ND	106	70-120			
Bromoform	500.2	10.0	ug/L	501	ND	99.8	70-124			
1,2,3-Trichloropropane	539.1	10.0	ug/L	503	ND	107	62-135			
trans-1,4-Dichloro-2-butene	1123	50.0	ug/L	1000	ND	112	50-120			
1,1,2,2-Tetrachloroethane	527.3	10.0	ug/L	501	ND	105	63-126			
1,4-Dichlorobenzene	521.7	10.0	ug/L	501	ND	104	72-119			
1,2-Dichlorobenzene	508.4	10.0	ug/L	501	ND	101	71-117			
1,2-Dibromo-3-chloropropane	434.5	50.0	ug/L	501	ND	86.7	49-134			
Surrogate: Dibromofluoromethane	516		ug/L	502		103	57-128			
Surrogate: Dibromofluoromethane	516		ug/L	502		103	75-136			
Surrogate: 1,2-Dichloroethane-d4	610		ug/L	504		121	49-135			
Surrogate: 1,2-Dichloroethane-d4	610		ug/L	504		121	61-142			
Surrogate: Toluene-d8	525		ug/L	505		104	82-116			
Surrogate: Toluene-d8	525		ug/L	505		104	82-121			
Surrogate: 4-Bromofluorobenzene	570		ug/L	502		114	77-114			

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
Matrix Spike (1IJ1171-MS1)		Source: 1IJ1462-01		Prepared: 10/20/25 00:00 Analyzed: 10/20/25 19:05						
Surrogate: 4-Bromofluorobenzene	570		ug/L	502		114	80-116			
Matrix Spike Dup (1IJ1171-MSD1)		Source: 1IJ1462-01		Prepared: 10/20/25 00:00 Analyzed: 10/20/25 19:28						
Chloromethane	274.0	10.0	ug/L	303	ND	90.4	61-152	0.402	26	
Vinyl Chloride	499.3	10.0	ug/L	302	ND	165	66-149	6.25	23	M1
Bromomethane	236.0	10.0	ug/L	301	ND	78.3	43-171	4.64	29	
Chloroethane	278.4	10.0	ug/L	303	ND	91.8	69-148	2.17	25	
Trichlorofluoromethane	302.0	10.0	ug/L	303	ND	99.7	62-163	5.38	25	
1,1-Dichloroethylene	614.8	10.0	ug/L	501	ND	123	70-148	2.96	22	
Acetone	1549	100	ug/L	1000	ND	155	45-173	1.44	30	
Methyl Iodide	1063	10.0	ug/L	1000	ND	106	62-167	3.62	24	
Carbon Disulfide	1007	10.0	ug/L	1000	ND	101	71-163	0.663	22	
Methylene Chloride	495.6	50.0	ug/L	501	ND	98.9	69-140	0.364	19	
Acrylonitrile	613.8	50.0	ug/L	504	ND	122	32-159	0.0814	30	
trans-1,2-Dichloroethylene	611.9	10.0	ug/L	501	ND	122	69-144	3.36	22	
1,1-Dichloroethane	604.1	10.0	ug/L	501	ND	121	70-138	3.96	20	
Vinyl Acetate	1626	50.0	ug/L	1420	ND	114	58-142	3.41	24	
cis-1,2-Dichloroethylene	520.4	10.0	ug/L	504	ND	103	68-151	2.93	22	
2-Butanone (MEK)	1287	100	ug/L	1000	ND	129	50-160	6.12	23	
Bromochloromethane	651.6	10.0	ug/L	504	ND	129	65-143	0.490	22	
Chloroform	557.8	10.0	ug/L	501	ND	111	71-143	0.828	21	
1,1,1-Trichloroethane	557.1	10.0	ug/L	501	ND	111	63-133	3.04	23	
Carbon Tetrachloride	565.9	10.0	ug/L	501	ND	113	63-142	0.669	22	
Benzene	552.0	10.0	ug/L	504	ND	109	69-133	1.72	18	
1,2-Dichloroethane	650.8	10.0	ug/L	501	ND	130	63-138	2.88	20	
Trichloroethylene	553.6	10.0	ug/L	501	ND	111	71-133	1.08	23	
1,2-Dichloropropane	568.3	10.0	ug/L	501	ND	113	69-132	1.26	20	
Dibromomethane	485.5	10.0	ug/L	504	ND	96.4	70-147	2.84	22	
Bromodichloromethane	560.3	10.0	ug/L	501	ND	112	67-130	0.0357	21	
cis-1,3-Dichloropropene	465.3	10.0	ug/L	501	ND	92.9	61-126	1.17	21	
4-Methyl-2-pentanone (MIBK)	1268	50.0	ug/L	1000	ND	127	55-147	0.712	23	
Toluene	547.9	10.0	ug/L	505	ND	109	71-133	2.51	19	
trans-1,3-Dichloropropene	528.8	10.0	ug/L	501	ND	106	63-124	0.528	21	
1,1,2-Trichloroethane	555.7	10.0	ug/L	501	ND	111	69-133	2.39	19	
Tetrachloroethylene	496.5	10.0	ug/L	501	ND	99.1	70-124	4.87	24	
2-Hexanone (MBK)	1228	50.0	ug/L	1000	ND	123	53-141	1.53	24	
Dibromochloromethane	444.0	10.0	ug/L	501	ND	88.7	74-122	1.50	21	
1,2-Dibromoethane	492.8	10.0	ug/L	502	ND	98.1	66-127	0.365	23	
Chlorobenzene	499.3	10.0	ug/L	501	ND	99.7	76-116	3.46	21	
1,1,1,2-Tetrachloroethane	474.9	10.0	ug/L	503	ND	94.3	77-121	1.15	25	
Ethylbenzene	546.8	10.0	ug/L	502	ND	109	73-124	0.493	20	
Xylenes, total	1679	20.0	ug/L	1510	ND	111	75-123	3.15	20	
Styrene	525.3	10.0	ug/L	504	ND	104	70-120	1.32	23	

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CERTIFICATE OF ANALYSIS

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Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1171 - EPA 5030B - EPA 8260D										
Matrix Spike Dup (1IJ1171-MSD1)	Source: 1IJ1462-01			Prepared: 10/20/25 00:00 Analyzed: 10/20/25 19:28						
Bromoform	482.1	10.0	ug/L	501	ND	96.2	70-124	3.69	22	
1,2,3-Trichloropropane	519.6	10.0	ug/L	503	ND	103	62-135	3.68	28	
trans-1,4-Dichloro-2-butene	1122	50.0	ug/L	1000	ND	112	50-120	0.107	26	
1,1,2,2-Tetrachloroethane	530.9	10.0	ug/L	501	ND	106	63-126	0.680	24	
1,4-Dichlorobenzene	506.8	10.0	ug/L	501	ND	101	72-119	2.90	24	
1,2-Dichlorobenzene	499.7	10.0	ug/L	501	ND	99.8	71-117	1.73	24	
1,2-Dibromo-3-chloropropane	439.4	50.0	ug/L	501	ND	87.7	49-134	1.12	28	
Surrogate: Dibromofluoromethane	515		ug/L	502		103	57-128			
Surrogate: Dibromofluoromethane	515		ug/L	502		103	75-136			
Surrogate: 1,2-Dichloroethane-d4	622		ug/L	504		123	49-135			
Surrogate: 1,2-Dichloroethane-d4	622		ug/L	504		123	61-142			
Surrogate: Toluene-d8	524		ug/L	505		104	82-116			
Surrogate: Toluene-d8	524		ug/L	505		104	82-121			
Surrogate: 4-Bromofluorobenzene	566		ug/L	502		113	77-114			
Surrogate: 4-Bromofluorobenzene	566		ug/L	502		113	80-116			
Batch 1IJ1423 - EPA 5030B - EPA 8260D										
Blank (1IJ1423-BLK1)	Prepared: 10/23/25 00:00 Analyzed: 10/23/25 10:35									
Carbon Disulfide	<1.0	1.0	ug/L							
Surrogate: Dibromofluoromethane	46.8		ug/L	50.2		93.3	75-136			
Surrogate: 1,2-Dichloroethane-d4	57.4		ug/L	50.4		114	61-142			
Surrogate: Toluene-d8	51.1		ug/L	50.5		101	82-121			
Surrogate: 4-Bromofluorobenzene	51.4		ug/L	50.2		103	80-116			
LCS (1IJ1423-BS1)	Prepared: 10/23/25 00:00 Analyzed: 10/23/25 15:32									
Carbon Disulfide	104.7	1.0	ug/L	100		105	72-162			
Surrogate: Dibromofluoromethane	47.9		ug/L	50.2		95.4	75-136			
Surrogate: 1,2-Dichloroethane-d4	58.1		ug/L	50.4		115	61-142			
Surrogate: Toluene-d8	50.8		ug/L	50.5		101	82-121			
Surrogate: 4-Bromofluorobenzene	57.3		ug/L	50.2		114	80-116			
LCS Dup (1IJ1423-BSD1)	Prepared: 10/23/25 00:00 Analyzed: 10/23/25 15:55									
Carbon Disulfide	107.0	1.0	ug/L	100		107	72-162	2.18	24	
Surrogate: Dibromofluoromethane	47.6		ug/L	50.2		94.8	75-136			
Surrogate: 1,2-Dichloroethane-d4	28.1		ug/L	50.4		55.8	61-142			S2
Surrogate: Toluene-d8	51.9		ug/L	50.5		103	82-121			
Surrogate: 4-Bromofluorobenzene	57.2		ug/L	50.2		114	80-116			
Matrix Spike (1IJ1423-MS1)	Source: 3IJ0087-07			Prepared: 10/23/25 00:00 Analyzed: 10/23/25 16:18						
Carbon Disulfide	1092	10.0	ug/L	1000	ND	109	71-163			
Surrogate: Dibromofluoromethane	474		ug/L	502		94.5	75-136			
Surrogate: 1,2-Dichloroethane-d4	590		ug/L	504		117	61-142			
Surrogate: Toluene-d8	519		ug/L	505		103	82-121			

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CERTIFICATE OF ANALYSIS

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Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11J1423 - EPA 5030B - EPA 8260D										
Matrix Spike (11J1423-MS1)	Source: 31J0087-07			Prepared: 10/23/25 00:00 Analyzed: 10/23/25 16:18						
Surrogate: 4-Bromofluorobenzene	573		ug/L	502		114	80-116			
Matrix Spike Dup (11J1423-MSD1)	Source: 31J0087-07			Prepared: 10/23/25 00:00 Analyzed: 10/23/25 16:41						
Carbon Disulfide	1048	10.0	ug/L	1000	ND	105	71-163	4.11	22	
Surrogate: Dibromofluoromethane	493		ug/L	502		98.2	75-136			
Surrogate: 1,2-Dichloroethane-d4	588		ug/L	504		117	61-142			
Surrogate: Toluene-d8	512		ug/L	505		102	82-121			
Surrogate: 4-Bromofluorobenzene	583		ug/L	502		116	80-116			
Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11J1122 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Blank (11J1122-BLK1)	Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:27									
Antimony	<0.0010	0.0010	mg/L							
Arsenic	<0.0020	0.0020	mg/L							
Barium	<0.0010	0.0010	mg/L							
Beryllium	<0.0005	0.0005	mg/L							
Cadmium	<0.0002	0.0002	mg/L							
Chromium	<0.0010	0.0010	mg/L							B
Cobalt	<0.0005	0.0005	mg/L							
Copper	<0.0050	0.0050	mg/L							
Lead	<0.0010	0.0010	mg/L							
Nickel	<0.0050	0.0050	mg/L							
Selenium	<0.0020	0.0020	mg/L							
Silver	<0.0050	0.0050	mg/L							
Thallium	<0.0005	0.0005	mg/L							
Vanadium	<0.0020	0.0020	mg/L							
Zinc	<0.0050	0.0050	mg/L							
LCS (11J1122-BS1)	Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:35									
Antimony	0.110	0.0010	mg/L	0.100		110	80-120			
Arsenic	0.0984	0.0020	mg/L	0.100		98.4	80-120			
Barium	0.107	0.0010	mg/L	0.100		107	80-120			
Beryllium	0.0976	0.0005	mg/L	0.100		97.6	80-120			
Cadmium	0.100	0.0002	mg/L	0.100		100	80-120			
Chromium	0.118	0.0010	mg/L	0.100		118	80-120			
Cobalt	0.110	0.0005	mg/L	0.100		110	80-120			
Copper	0.102	0.0050	mg/L	0.100		102	80-120			
Lead	0.103	0.0010	mg/L	0.100		103	80-120			
Nickel	0.0980	0.0050	mg/L	0.100		98.0	80-120			
Selenium	0.0977	0.0020	mg/L	0.100		97.7	80-120			
Silver	0.106	0.0050	mg/L	0.100		106	80-120			
Thallium	0.106	0.0005	mg/L	0.100		106	80-120			

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CERTIFICATE OF ANALYSIS

11J1463

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 11J1122 - EPA 3005A Total Recoverable Metals - EPA 6020A										
LCS (11J1122-BS1)			Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:35							
Vanadium	0.117	0.0020	mg/L	0.100		117	80-120			
Zinc	0.106	0.0050	mg/L	0.100		106	80-120			
Matrix Spike (11J1122-MS1)			Source: 11J1462-01	Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:43						
Antimony	0.115	0.0010	mg/L	0.100	0.0008	114	75-125			M6
Arsenic	0.105	0.0020	mg/L	0.100	ND	105	75-125			
Barium	0.526	0.0010	mg/L	0.100	0.354	172	75-125			
Beryllium	0.101	0.0005	mg/L	0.100	ND	101	75-125			
Cadmium	0.101	0.0002	mg/L	0.100	ND	101	75-125			
Chromium	0.110	0.0010	mg/L	0.100	0.0010	109	75-125			
Cobalt	0.110	0.0005	mg/L	0.100	0.0001	109	75-125			
Copper	0.0985	0.0050	mg/L	0.100	ND	98.5	75-125			
Lead	0.105	0.0010	mg/L	0.100	ND	105	75-125			
Nickel	0.0974	0.0050	mg/L	0.100	0.0005	96.9	75-125			
Selenium	0.1037	0.0020	mg/L	0.100	ND	104	75-125			
Silver	0.107	0.0050	mg/L	0.100	ND	107	75-125			
Thallium	0.109	0.0005	mg/L	0.100	ND	109	75-125			
Vanadium	0.119	0.0020	mg/L	0.100	ND	119	75-125			
Zinc	0.104	0.0050	mg/L	0.100	ND	104	75-125			
Matrix Spike Dup (11J1122-MSD1)			Source: 11J1462-01	Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:45						
Antimony	0.118	0.0010	mg/L	0.100	0.0008	117	75-125	2.21	20	M6
Arsenic	0.104	0.0020	mg/L	0.100	ND	104	75-125	0.170	20	
Barium	0.527	0.0010	mg/L	0.100	0.354	172	75-125	0.172	20	
Beryllium	0.102	0.0005	mg/L	0.100	ND	102	75-125	1.27	20	
Cadmium	0.101	0.0002	mg/L	0.100	ND	101	75-125	0.440	20	
Chromium	0.112	0.0010	mg/L	0.100	0.0010	111	75-125	1.40	20	
Cobalt	0.112	0.0005	mg/L	0.100	0.0001	112	75-125	2.32	20	
Copper	0.100	0.0050	mg/L	0.100	ND	100	75-125	1.83	20	
Lead	0.106	0.0010	mg/L	0.100	ND	106	75-125	0.798	20	
Nickel	0.0994	0.0050	mg/L	0.100	0.0005	98.9	75-125	2.00	20	
Selenium	0.1028	0.0020	mg/L	0.100	ND	103	75-125	0.856	20	
Silver	0.110	0.0050	mg/L	0.100	ND	110	75-125	2.65	20	
Thallium	0.112	0.0005	mg/L	0.100	ND	112	75-125	2.72	20	
Vanadium	0.123	0.0020	mg/L	0.100	ND	123	75-125	3.25	20	
Zinc	0.107	0.0050	mg/L	0.100	ND	107	75-125	3.00	20	
Post Spike (11J1122-PS1)			Source: 11J1462-01	Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:48						
Antimony	0.0212		mg/L	0.0200	0.0008	102	80-120			M6
Arsenic	0.0179		mg/L	0.0200	0.0004	87.7	80-120			
Barium	0.366		mg/L	0.0200	0.354	59.8	80-120			
Beryllium	0.0205		mg/L	0.0200	0.000002	102	80-120			
Cadmium	0.0194		mg/L	0.0200	-0.00004	97.0	80-120			
Chromium	0.0215		mg/L	0.0200	0.0010	103	80-120			
Cobalt	0.0201		mg/L	0.0200	0.0001	99.9	80-120			
Copper	0.0198		mg/L	0.0200	0.0007	95.7	80-120			

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CERTIFICATE OF ANALYSIS

1IJ1463

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1IJ1122 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Post Spike (1IJ1122-PS1) Source: 1IJ1462-01 Prepared: 10/20/25 09:25 Analyzed: 10/20/25 20:48										
Lead	0.0204		mg/L	0.0200	0.000006	102	80-120			
Nickel	0.0194		mg/L	0.0200	0.0005	94.2	80-120			
Selenium	0.0200		mg/L	0.0200	0.0006	97.3	80-120			
Silver	0.0216		mg/L	0.0200	0.00006	108	80-120			
Thallium	0.0202		mg/L	0.0200	0.000005	101	80-120			
Vanadium	0.0212		mg/L	0.0200	0.000009	106	80-120			
Zinc	0.0219		mg/L	0.0200	0.0024	97.3	80-120			

Definitions

B:	The target analyte was detected in the blank at or above the method acceptance criteria.
M1:	Matrix spike recovery is above acceptance limits.
M6:	Matrix spike recovery is outside of acceptance limits. The analyte concentration is greater than 4X the spiking level.
RL:	Reporting Limit
RPD:	Relative Percent Difference
S1:	Surrogate recovery is above acceptance limits.
S2:	Surrogate recovery is below acceptance limits.

Cooler Receipt Log

Cooler ID: Default Cooler	Temp: 5.0°C	Cooler ID: New Cooler	Temp: 5.5°C
Cooler ID: New Cooler [1]	Temp: 5.9°C	Cooler ID: New Cooler [2]	Temp: 6.6°C

Cooler Inspection Checklist

Custody Seals	No	Containers Intact	Yes
COC/Labels Agree	Yes	Preservation Confirmed	No
Received On Ice	Yes		

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.

Reviewed and Approved By:

Heather Murphy
Customer Relationship Specialist
heather.murphy@microbac.com
10/29/25 16:16

CHAIN OF CUSTODY RECORD



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Page 1 of 2

Printed: 9/23/2025 11:42:05AM

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SITE INFORMATION

Sampler: TODD WHIPPLE

Project: Jackson Co. Landfill-New Regs
6040

REPORT TO

Todd Whipple
HLW Engineering
204 West Broad St
Story City, IA 50248

INVOICE TO

Frank Frieberg
Waste Authority of Jackson County
201 W Platt St
Maquoketa, IA 52060

SPECIAL INSTRUCTIONS

None

Turn Around Time

☐ Standard ☐ RUSH, need by ___/___/___

LAB USE ONLY



HLW Engineering
PM: Heather Murphy

Temperature: 5.0°/5.5° °C
5.9°/6.6°

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number
01-001	MW-10	Aqueous	GRAB	10/14/25	8:12	1	Indfil-app1-metals-6020	01
02-001	MW-11	Aqueous	GRAB	10/14/25	7:33	7	Indfil-app1-metals-6020dfill-app1-voc-group	02
03-001	MW-12	Aqueous	GRAB	10/14/25	7:48	7	Indfil-app1-metals-6020dfill-app1-voc-group	03
04-001	MW-13	Aqueous	GRAB	10/14/25	7:15	1	Indfil-app1-metals-6020	04
05-001	MW-14	Aqueous	GRAB	10/14/25	6:53	1	Indfil-app1-metals-6020	05
06-001	MW-15	Aqueous	GRAB	10/14/25	7:02	1	Indfil-app1-metals-6020	06
07-001	MW-17	Aqueous	GRAB	10/14/25	8:49	7	Indfil-app1-metals-6020dfill-app1-voc-group	07
08-001	MW-19 <u>DRY</u>	Aqueous	GRAB	10/14/25	—	—	Indfil-app1-metals-6020dfill-app1-voc-group	
09-001	MW-20 <u>DRY</u>	Aqueous	GRAB	10/14/25	—	—	Indfil-app1-metals-6020dfill-app1-voc-group	
10-001	Field Duplicate	Aqueous	GRAB	10/14/25	✓	1	Indfil-app1-metals-6020dfill-app1-voc-group	08

Relinquished By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Received for Lab By

Date/Time

Remarks:

ATTACHMENT B

Field Sampling Forms

JACKSON COUNTY SANITARY LANDFILL
PERMIT # 49-SDP-01-74

4/3/2025

Sampled by: T. Whipple

Weather conditions: Overcast, breezy 42 degrees

IDNR Form 542-1322

Monitoring Well: MW 11 (dg)

Primary Sampling Method:

Secondary Sampling Method:

No-Purge for Appendix I

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	899.8
Well Depth	132.67
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	899.8
Well Depth	132.67
Top Screen	778.00
Bottom Screen	768.00
Bottom Well	767.13
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	120.00
Top sample	779.80
Bottom sample	775.80
Turbidity(NTU)	2.32

Date	Time	Water Level	Water Elevation
4/3/2025	15:28	91.3	808.5

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		2.32
Appendix I	Metals	250	150		2.32
Appendix I	VOC	120	240		2.32
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			400	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

Monitoring Well: MW 10 (Ug)

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

TOC	919.16
Well Depth	114.30
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

TOC	919.16
Well Depth	114.30
Top Screen	814.86
Bottom Screen	804.86
Bottom Well	804.86
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	105.00
Top sample	814.16
Bottom sample	810.16
Turbidity(NTU)	2.44

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		2.44
Appendix I	Metals	250	250		2.44
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 12(dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	898.17
Well Depth	109.90
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	898.17
Well Depth	109.90
Top Screen	793.27
Bottom Screen	788.27
Bottom Well	788.27
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	100.00
Top sample	798.17
Bottom sample	794.17
Turbidity(NTU)	4.84

Date	Time	Water Level	Water Elevation	Notes
4/3/2025	15:39	91.44	806.73	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		4.84
Appendix I	Metals	250	250		4.84
Appendix I	VOC	120	120		4.84
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 13 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	882.02
Well Depth	47.70
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	882.02
Well Depth	47.70
Top Screen	844.32
Bottom Screen	834.32
Bottom Well	834.32
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	42.00
Top sample	840.02
Bottom sample	836.02
Turbidity(NTU)	4.70

Date	Time	Water Level	Water Elevation	Notes
4/3/2025	14:02	35.3	846.72	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		4.70
Appendix I	Metals	250	250		4.70
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 14 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	849.16
Well Depth	69.65
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	849.16
Well Depth	69.65
Top Screen	799.51
Bottom Screen	779.51
Bottom Well	779.51
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	63.00
Top sample	786.16
Bottom sample	782.16
Turbidity(NTU)	9.87

Date	Time	Water Level	Water Elevation	Notes
4/3/2025	16:31	42.46	806.7	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		9.87
Appendix I	Metals	250	250		9.87
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 15 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	849.91
Well Depth	19.75
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	849.91
Well Depth	19.75
Top Screen	840.16
Bottom Screen	830.16
Bottom Well	830.16
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	14.00
Top sample	835.91
Bottom sample	831.91
Turbidity(NTU)	12.36

Date	Time	Water Level	Water Elevation	Notes
4/3/2025	16:22	3.39	846.52	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		12.36
Appendix I	Metals	250	250		12.36
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 17 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	879.05
Well Depth	45.15
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	879.05
Well Depth	45.15
Top Screen	843.90
Bottom Screen	833.90
Bottom Well	833.90
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	39.00
Top sample	840.05
Bottom sample	836.05
Turbidity(NTU)	3.02

Date	Time	Water Level	Water Elevation	Notes
4/3/2025	14:25	30.49	848.56	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		3.02
Appendix I	Metals	250	250		3.02
Appendix I	VOC	120	120		3.02
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 19 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	896.4
Well Depth	79.42
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	896.4
Well Depth	79.42
Top Screen	826.98
Bottom Screen	816.98
Bottom Well	816.98
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	
Top sample	896.40
Bottom sample	892.40
Turbidity(NTU)	

☐ Dry

Date	Time	Water Level	Water Elevation	Notes
4/3/2025		80.2	816.2	No sample

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		0.00
Appendix I	Metals	250	250		0.00
Appendix I	VOC	120	120		0.00
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 20 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	881.86
Well Depth	79.47
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	881.86
Well Depth	79.47
Top Screen	812.39
Bottom Screen	802.39
Bottom Well	802.39
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	
Top sample	881.86
Bottom sample	877.86
Turbidity(NTU)	

☐ Dry

Date	Time	Water Level	Water Elevation	Notes
4/3/2025		79.65	802.21	No sample

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10			0.00
Appendix I	Metals	250			0.00
Appendix I	VOC	120			0.00
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			0	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

JACKSON COUNTY SANITARY LANDFILL
PERMIT # 49-SDP-01-74

10/14/2025

Sampled by: T. Whipple

Weather conditions: Partly sunny, breezy, 40-48 degrees

IDNR Form 542-1322

Monitoring Well: MW 11 (dg)

Primary Sampling Method:

Secondary Sampling Method:

No-Purge for Appendix I

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	899.8
Well Depth	132.67
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	899.8
Well Depth	132.67
Top Screen	778.00
Bottom Screen	768.00
Bottom Well	767.13
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	120.00
Top sample	779.80
Bottom sample	775.80
Turbidity(NTU)	1.65

Date	Time	Water Level	Water Elevation
10/14/2025	7:33	90.57	809.23

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		1.65
Appendix I	Metals	250	150		1.65
Appendix I	VOC	120	240		1.65
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			400	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

Monitoring Well: MW 10 (Ug)

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

TOC	919.16
Well Depth	114.30
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

TOC	919.16
Well Depth	114.30
Top Screen	814.86
Bottom Screen	804.86
Bottom Well	804.86
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	104.00
Top sample	815.16
Bottom sample	811.16
Turbidity(NTU)	0.92

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	8:12	89.44	829.72	

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		0.92
Appendix I	Metals	250	250		0.92
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 12(dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	898.17
Well Depth	109.90
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	898.17
Well Depth	109.90
Top Screen	793.27
Bottom Screen	788.27
Bottom Well	788.27
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	100.00
Top sample	798.17
Bottom sample	794.17
Turbidity(NTU)	1.87

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	7:48	90.78	807.39	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		1.87
Appendix I	Metals	250	250		1.87
Appendix I	VOC	120	120		1.87
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 13 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	882.02
Well Depth	47.70
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	882.02
Well Depth	47.70
Top Screen	844.32
Bottom Screen	834.32
Bottom Well	834.32
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	42.00
Top sample	840.02
Bottom sample	836.02
Turbidity(NTU)	3.63

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	7:15	35.03	846.99	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		3.63
Appendix I	Metals	250	250		3.63
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 14 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	849.16
Well Depth	69.65
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	849.16
Well Depth	69.65
Top Screen	799.51
Bottom Screen	779.51
Bottom Well	779.51
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	63.00
Top sample	786.16
Bottom sample	782.16
Turbidity(NTU)	21.80

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	6:53	40.75	808.41	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		21.80
Appendix I	Metals	250	250		21.80
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 15 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	849.91
Well Depth	19.75
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	849.91
Well Depth	19.75
Top Screen	840.16
Bottom Screen	830.16
Bottom Well	830.16
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	14.00
Top sample	835.91
Bottom sample	831.91
Turbidity(NTU)	4.57

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	7:02	10.85	839.06	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		4.57
Appendix I	Metals	250	250		4.57
Appendix I	VOC	120			
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 17 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	879.05
Well Depth	45.15
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	879.05
Well Depth	45.15
Top Screen	843.90
Bottom Screen	833.90
Bottom Well	833.90
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	38.00
Top sample	841.05
Bottom sample	837.05
Turbidity(NTU)	1.69

Date	Time	Water Level	Water Elevation	Notes
10/14/2025	8:49	29.8	849.25	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		1.69
Appendix I	Metals	250	250		1.69
Appendix I	VOC	120	120		1.69
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 19 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	896.4
Well Depth	79.42
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	896.4
Well Depth	79.42
Top Screen	826.98
Bottom Screen	816.98
Bottom Well	816.98
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	
Top sample	896.40
Bottom sample	892.40
Turbidity(NTU)	

☐ Dry

Date	Time	Water Level	Water Elevation	Notes
10/14/2025		78.91	817.49	No sample

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10		0.00
Appendix I	Metals	250	250		0.00
Appendix I	VOC	120	120		0.00
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

IDNR Form 542-1322

Monitoring Well: MW 20 (dg)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	881.86
Well Depth	79.47
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	881.86
Well Depth	79.47
Top Screen	812.39
Bottom Screen	802.39
Bottom Well	802.39
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	
Top sample	881.86
Bottom sample	877.86
Turbidity(NTU)	

 Dry

Date	Time	Water Level	Water Elevation	Notes
10/14/2025		79.55	802.31	No sample

ANALYTES, CONTAINERS, AND VOLUMES

Analyte		Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10			0.00
Appendix I	Metals	250			0.00
Appendix I	VOC	120			0.00
Full Appendix II	10 more containers	5620			
TSS	TSS	1000			
Supplemental	BEHP	1 - qt			
Supplemental					
Total			0	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

[illegible]

ATTACHMENT C

Statistical Reports, Spring 2025 & Fall, 2025

Results of the Ground Water Statistics for Jackson County Sanitary Landfill

First Semi-Annual Monitoring Event in 2025

Prepared for:
Waste Authority of Jackson County
201 West Platt Street
Maquoketa, IA

Prepared by:
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Otter Creek Environmental Services, L.L.C.
Elgin, IL
(847) 464-1355

June 2025

INTRODUCTION

This report contains the results of the statistical analyses used to evaluate the ground water data obtained during the first semi-annual monitoring event in 2025 at Jackson County Sanitary Landfill. The ground water at Jackson County Sanitary Landfill is monitored by a network of wells including MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21. Monitoring wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, and MW-17 were sampled on April 3, 2025 and analyzed for the parameters required by permit. At the request of the Iowa DNR, trend analysis and confidence intervals are computed for wells with historical volatile organic compound (VOC) detections.

Ground Water Monitoring Program

The groundwater monitoring network for Jackson County Sanitary Landfill includes MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21. The groundwater monitoring wells is to be sampled and analyzed for the detection monitoring parameters listed in 113.10(5), which includes 15 inorganic constituents and 47 organic compounds, summarized below.

Detection monitoring constituents listed in Appendix I of IAC 567, Chapter 113.

Organic Compounds:

Acetone	<i>trans</i> -1,4-Dichloro-2-butene	Iodomethane
Acrylonitrile	1,1-Dichloroethane	4-Methyl-2-pentanone
Benzene	1,2-Dichloroethane	Styrene
Bromochloromethane	1,1-Dichloroethene	1,1,1,2-Tetrachloroethane
Bromodichloromethane	<i>cis</i> -1,2-Dichloroethene	1,1,2,2-Tetrachloroethane
Bromoform	<i>trans</i> -1,2-Dichloroethene	Tetrachloroethene
Carbon disulfide	1,2-Dichloropropane	Toluene
Carbon tetrachloride	<i>cis</i> -1,3-Dichloropropene	1,1,1-Trichloroethane
Chlorobenzene	<i>trans</i> -1,3-Dichloropropene	1,1,2-Trichloroethane
Chloroethane	Ethylbenzene	Trichloroethene
Chloroform	2-Hexanone	Trichlorofluoromethane
Dibromochloromethane	Bromomethane	1,2,3-Trichloropropane
1,2-Dibromo-3-chloropropane	Chloromethane	Vinyl acetate
1,2-Dibromoethane	Dibromomethane	Vinyl chloride
1,2-Dichlorobenzene	Methylene chloride	Xylenes (Total)
1,4-Dichlorobenzene	2-Butanone	

Inorganic constituents:

Antimony, Total	Chromium, Total	Selenium, Total
Arsenic, Total	Cobalt, Total	Silver, Total
Barium, Total	Copper, Total	Thallium, Total
Beryllium, Total	Lead, Total	Vanadium, Total
Cadmium, Total	Nickel, Total	Zinc, Total

The ground water data obtained during the first semi-annual monitoring event in 2025 are summarized in Attachment A.

STATISTICAL METHODOLOGIES FOR DETECTION MONITORING

IAC 567, Chapter 113.10(4) provides several options for statistically evaluating the ground water data at those wells that monitor the open cells or contiguous MSWLF units. The preferred methods for comparing

ground water data are using either prediction limits or using control charts. The intrawell method using combined Shewhart-CUSUM control charts was applied to the Jackson County Landfill trace metals data using the DUMPStat® statistical program. DUMPStat® is a program for the statistical analysis of groundwater monitoring data using methods described in “Statistical Methods for Groundwater Monitoring” by Dr. Robert D. Gibbons. The DUMPStat program is completely consistent with all USEPA regulations and guidance and the ASTM D6312-98 guidance. The wells impacted with VOCs are evaluated with confidence intervals using the DUMPStat statistical program.

Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are generally man-made compounds not present in ambient ground water. If VOCs are detected above their statistical limit (i.e., the laboratory PQL or reporting limit), a verification resample will be conducted at the next scheduled sampling event. A statistical exceedance will be indicated if the VOC detection is confirmed by the subsequent monitoring.

VOCs detected in the ground water at Jackson County Sanitary Landfill during the first semi-annual monitoring event in 2025 are summarized below.

VOCs detected during the first semi-annual monitoring period in 2025

Well	VOC Detected	Result, µg/L	Reporting Limit, µg/L	Verified/ Awaiting verification	Water Quality Standard
MW-11	Tetrachloroethene	2.0	1	Verified	5 ^a
MW-12	Trichloroethene	1.8	1	Verified	5 ^a
MW-17	Tetrachloroethene	1.2	1	Awaiting verification	5 ^a

a - USEPA MCL

b- Iowa Statewide Standard for a protected groundwater source

Tetrachloroethene detected multiple times at MW-11 with the most recent being in October 2024. Trichloroethene was detected multiple times at MW-12 with the most recent being in October 2024. Tetrachloroethene was previously detected multiple times at MW-17 with the most recent being in April 2024. Historical VOC detections are summarized in Attachment B.

The verified VOC detections were evaluated against the ground water protection standards (GWPS) using confidence limits calculated in accordance with the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, March 2009. The analysis was conducted to evaluate whether verified concentrations are significantly above the water quality standard. The 95% lower confidence limit (LCL) for the mean of the historical data was used to evaluate whether the regulated unit is in compliance with the ground-water protection standards under 40 CFR 264 (e.g. whether the verified constituent is detected at a significant level above the GWPS). An exceedance is verified if the LCL is above the Regulatory GWPS.

The calculated 95% LCLs for each of the verified VOCs are below the respective GWPS (Attachment C). No increasing trends were detected.

Trace Metals

The historical Appendix I trace metals data obtained from monitoring wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21 are plotted in Attachment D. Increasing trends were detected in the historical data for arsenic at MW-13 and barium at MW-14. Decreasing trends were detected in the historical data for arsenic at MW-19 and arsenic, cobalt, and nickel at MW-20.

Intrawell statistics

Intrawell statistics are appropriate for facilities where the upgradient wells do not accurately characterize the natural ground water conditions downgradient from the facility. This may be due to different hydrogeological conditions where the wells are screened, having too few upgradient wells to account for the spatial variability, or the site exhibiting no definable hydraulic gradient. Intrawell statistics compare new measurements to the historical data at each ground water monitoring well independently. It is recommended that at least eight background samples be obtained prior to performing the statistics.

The most useful technique for intrawell comparisons is the combined Shewhart-CUSUM control chart. This control chart procedure is useful because it will detect releases both in terms of the constituent concentration and cumulative increases. This method is also extremely sensitive to sudden and gradual releases. A requirement for constructing these control charts is that the parameter is detected at a frequency greater than or equal to 25%, otherwise the data variance is not properly defined.

The combined Shewhart-CUSUM control chart assumes that the data are independent and normally distributed with a fixed mean and a constant variance. Independent data is much more critical than the normality assumption. To achieve independence, it is recommended that data are collected no more frequently than quarterly to account for seasonal variation. The combined Shewhart-CUSUM control chart is extremely robust to deviations from normality. Because the control charts do not use a specific multiplier based on a normal distribution, it is more conservative to assume normality.

It is recommended that at least eight rounds of data be available to provide a reliable estimate of the mean and standard deviation of the parameter concentration, although the control charts will be generated with as few as four data points. Having only four data points may produce greater uncertainty in the mean and standard deviation of the background data, leading to higher control limits, thus having a potentially high false negative rate.

Many groundwater monitoring parameters are not detected at a frequency great enough to generate the combined Shewhart-CUSUM control charts. For constituents that are detected less than 25% of the time at a particular well, the data should be plotted as a time series until a sufficient number of data points are available to provide a 99% confidence nonparametric prediction limit. Thirteen independent measurements (with 1 resample) are necessary to achieve a 99% confidence (1% false positive rate) nonparametric prediction limit. Eight independent measurements (for pass 1 of 2 resamples) are necessary to achieve a 99% confidence nonparametric prediction limit. The nonparametric prediction limit is the largest determination out of the data set collected for that well and parameter. If the detection frequency is 0% after thirteen samples have been collected, the practical quantitation limit (PQL) becomes the nonparametric prediction limit.

In developing the statistical background, the historical data must be thoroughly screened for anomalous data due to sampling error, analytical error, or simply by chance alone. An erroneous data point, if not removed prior to the mean and variance computations, would yield a larger control limit thus increasing the false negative rate. The DUMPStat® program screens for outliers using the Dixon test. Anomalous data will still be plotted on the graphs (with a unique symbol) but will not be included in the calculations.

The verification resample plan is an integral function of the statistical plan to reduce the probability that anomalous data obtained after the background has been established, is indicative of a landfill release.

The background data for each well and constituent is tested for existing trends using Sen's nonparametric estimate of trend. If contamination exists prior to completing the background, the control limits could be potentially high and this control chart method would not be able to detect an increasing trend unless the increase is severe.

Results of the Intrawell Statistics

The Appendix I trace metals data from wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, and MW-17 were evaluated using the combined Shewhart-CUSUM control chart method. The previous background included the data obtained from 2014 through 2019. Even for wells with eight rounds of background, there is insufficient data to determine control limits given the approved resample program. For constituents that are detected less than 25% of the time at a particular well, thirteen independent measurements (with 1 resample) are necessary to achieve a 99% confidence (1% false positive rate) nonparametric prediction limit. The background was extended to include data obtained from 2014 through April 2022.

A summary of the intrawell statistics is included in Attachment E, Table 1 “Summary Statistics and Intermediate Computations for Combined Shewhart-CUSUM Control Charts.” The control charts or time series graphs follow the summary table. For the parameters compared to background, there were no control limit exceedances detected. Increasing trends were detected in the historical data for arsenic at MW-13 and barium at MW-14.

A control chart factor was selected to provide a balance of the site-wide false positive and false negative rates. A statistical power curve indicates the expected false assessments for the site as a whole. For intrawell analysis, the site-wide false positive rate is 19% and the test becomes sensitive to 4 standard deviation units over background.

The past and current verified trace metal exceedances were evaluated against the GWPS using confidence limits. The 95% LCL for cobalt at MW-13 (5.717 µg/L) exceeds the GWPS of 2.1 µg/L. The calculated 95% LCL for each of the remaining trace metal exceedances are below the respective GWPS (Attachment F).

Attachment A

Ground Water Data obtained during the First Semi-Annual Monitoring Event in 2025

Table 1

Analytical Data Summary for 4/3/2025

Constituents	Units	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-17
1,1,1,2-tetrachloroethane	ug/L		<1	<1				<1
1,1,1-trichloroethane	ug/L		<1	<1				<1
1,1,2,2-tetrachloroethane	ug/L		<1	<1				<1
1,1,2-trichloroethane	ug/L		<1	<1				<1
1,1-dichloroethane	ug/L		<1	<1				<1
1,1-dichloroethene	ug/L		<1	<1				<1
1,2,3-trichloropropane	ug/L		<1	<1				<1
1,2-dibromo-3-chloropropane	ug/L		<5	<5				<5
1,2-dibromoethane	ug/L		<1	<1				<1
1,2-dichlorobenzene	ug/L		<1	<1				<1
1,2-dichloroethane	ug/L		<1	<1				<1
1,2-dichloropropane	ug/L		<1	<1				<1
1,4-dichlorobenzene	ug/L		<1	<1				<1
2-butanone	ug/L		<10	<10				<10
2-hexanone	ug/L		<5	<5				<5
4-methyl-2-pentanone	ug/L		<5	<5				<5
Acetone	ug/L		<10	<10				<10
Acrylonitrile	ug/L		<5	<5				<5
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<2.0	<2.0	<2.0	8.6	7.5	<2.0	<2.0
Barium, total	ug/L	94.4	107.0	329.0	528.0	873.0	431.0	211.0
Benzene	ug/L		<1	<1				<1
Beryllium, total	ug/L	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Bromochloromethane	ug/L		<1	<1				<1
Bromodichloromethane	ug/L		<1	<1				<1
Bromoform	ug/L		<1	<1				<1
Bromomethane	ug/L		<1	<1				<1
Cadmium, total	ug/L	<.2	<.2	<.2	<.2	<.2	<.2	.6
Carbon disulfide	ug/L		<1	<1				<1
Carbon tetrachloride	ug/L		<1	<1				<1
Chlorobenzene	ug/L		<1	<1				<1
Chloroethane	ug/L		<1	<1				<1
Chloroform	ug/L		<1	<1				<1
Chloromethane	ug/L		<1	<1				<1
Chromium, total	ug/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9
Cis-1,2-dichloroethene	ug/L		<1	<1				<1
Cis-1,3-dichloropropene	ug/L		<1	<1				<1
Cobalt, total	ug/L	<.5	<.5	1.1	6.9	<.5	11.8	7.3
Copper, total	ug/L	<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane	ug/L		<1	<1				<1
Dibromomethane	ug/L		<1	<1				<1
Ethylbenzene	ug/L		<1	<1				<1
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1
Methyl iodide	ug/L		<1	<1				<1
Methylene chloride	ug/L		<5	<5				<5
Nickel, total	ug/L	<5.0	<5.0	<5.0	5.5	<5.0	12.9	21.0
Selenium, total	ug/L	<2	<2	<2	<2	<2	<2	<2
Silver, total	ug/L	<5	<5	<5	<5	<5	<5	<5
Styrene	ug/L		<1	<1				<1
Tetrachloroethene	ug/L		2.0	<1.0				1.2
Thallium, total	ug/L	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Toluene	ug/L		<1	<1				<1
Trans-1,2-dichloroethene	ug/L		<1	<1				<1
Trans-1,3-dichloropropene	ug/L		<1	<1				<1
Trans-1,4-dichloro-2-butene	ug/L		<5	<5				<5
Trichloroethene	ug/L		<1.0	1.8				<1.0
Trichlorofluoromethane	ug/L		<1	<1				<1
Vanadium, total	ug/L	<2	<2	<2	<2	<2	<2	<2
Vinyl acetate	ug/L		<5	<5				<5
Vinyl chloride	ug/L		<1	<1				<1
Xylenes, total	ug/L		<2	<2				<2
Zinc, total	ug/L	<5.0	15.0	8.8	<5.0	6.3	<5.0	13.2

* - The displayed value is the arithmetic mean of multiple database matches.

Attachment B

Historical VOC Detections

Table 1

Historical Volatile Organic Compound Detections

Constituent	Well	Date	Identifier	Result	Limit	Units
Tetrachloroethene	MW-11	10/04/2016		1.4	1.0	ug/L
Tetrachloroethene	MW-11	10/03/2017		2.3	1.0	ug/L
Tetrachloroethene	MW-11	10/12/2018		3.1	1.0	ug/L
Tetrachloroethene	MW-11	9/30/2019		2.0	1.0	ug/L
Tetrachloroethene	MW-11	4/16/2021		1.4	1.0	ug/L
Tetrachloroethene	MW-11	10/14/2021		1.4	1.0	ug/L
Tetrachloroethene	MW-11	4/13/2023		2.0	1.0	ug/L
Tetrachloroethene	MW-11	10/18/2023		1.3	1.0	ug/L
Tetrachloroethene	MW-11	10/08/2024		1.1	1.0	ug/L
Tetrachloroethene	MW-11	4/03/2025		2.0	1.0	ug/L
Acetone	MW-12	10/03/2017		15.4	10.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/04/2016		1.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	10/04/2016		1.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/03/2017		1.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	10/12/2018		2.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/17/2019		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	9/30/2019		1.1	1.0	ug/L
Tetrachloroethene	MW-12	4/08/2024		1.8	1.0	ug/L
Trichloroethene	MW-12	4/04/2016		5.0	1.0	ug/L
Trichloroethene	MW-12	10/04/2016		3.8	1.0	ug/L
Trichloroethene	MW-12	4/03/2017		4.5	1.0	ug/L
Trichloroethene	MW-12	10/03/2017		5.6	1.0	ug/L
Trichloroethene	MW-12	4/10/2018		4.9	1.0	ug/L
Trichloroethene	MW-12	10/12/2018		5.1	1.0	ug/L
Trichloroethene	MW-12	4/17/2019		3.9	1.0	ug/L
Trichloroethene	MW-12	9/30/2019		2.4	1.0	ug/L
Trichloroethene	MW-12	4/07/2020		3.5	1.0	ug/L
Trichloroethene	MW-12	10/07/2020		2.6	1.0	ug/L
Trichloroethene	MW-12	4/16/2021		2.7	1.0	ug/L
Trichloroethene	MW-12	10/14/2021		2.2	1.0	ug/L
Trichloroethene	MW-12	4/04/2022		2.5	1.0	ug/L
Trichloroethene	MW-12	10/04/2022		3.0	1.0	ug/L
Trichloroethene	MW-12	4/13/2023		2.2	1.0	ug/L
Trichloroethene	MW-12	10/18/2023		2.1	1.0	ug/L
Trichloroethene	MW-12	10/08/2024		2.2	1.0	ug/L
Trichloroethene	MW-12	4/03/2025		1.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-17	10/03/2017		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-17	10/12/2018		3.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-17	9/30/2019		1.1	1.0	ug/L
Tetrachloroethene	MW-17	4/04/2016		1.1	1.0	ug/L
Tetrachloroethene	MW-17	10/04/2016		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/03/2017		1.6	1.0	ug/L
Tetrachloroethene	MW-17	10/03/2017		1.7	1.0	ug/L
Tetrachloroethene	MW-17	10/12/2018		2.3	1.0	ug/L
Tetrachloroethene	MW-17	4/17/2019		1.2	1.0	ug/L
Tetrachloroethene	MW-17	9/30/2019		1.0	1.0	ug/L
Tetrachloroethene	MW-17	4/07/2020		1.4	1.0	ug/L
Tetrachloroethene	MW-17	4/16/2021		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/04/2022		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/13/2023		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/08/2024		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/03/2025		1.2	1.0	ug/L
1,1-dichloroethane	MW-19	10/04/2016		3.2	1.0	ug/L
1,1-dichloroethane	MW-19	4/03/2017		6.3	1.0	ug/L
1,1-dichloroethane	MW-19	10/03/2017		3.1	1.0	ug/L
1,1-dichloroethane	MW-19	4/10/2018		3.6	1.0	ug/L
1,1-dichloroethane	MW-19	10/12/2018		4.2	1.0	ug/L
1,1-dichloroethane	MW-19	4/17/2019		5.2	1.0	ug/L
1,1-dichloroethane	MW-19	9/30/2019		6.4	1.0	ug/L
1,1-dichloroethane	MW-19	4/07/2020		5.4	1.0	ug/L
1,1-dichloroethane	MW-19	10/07/2020		9.3	1.0	ug/L
1,1-dichloroethane	MW-19	4/16/2021		3.7	1.0	ug/L
1,1-dichloroethane	MW-19	10/14/2021		3.8	1.0	ug/L
1,1-dichloroethane	MW-19	4/04/2022		1.3	1.0	ug/L
1,1-dichloroethane	MW-19	10/04/2022		2.4	1.0	ug/L
Acetone	MW-19	10/04/2016		19.0	10.0	ug/L
Acetone	MW-19	4/03/2017		49.6	10.0	ug/L
Acetone	MW-19	10/12/2018		13.0	10.0	ug/L
Acetone	MW-19	4/04/2022		35.2	10.0	ug/L
Acetone	MW-19	10/04/2022		17.0	10.0	ug/L
Benzene	MW-19	3/17/2009		1.2	1.0	ug/L
Benzene	MW-19	10/04/2016		1.1	1.0	ug/L
Benzene	MW-19	4/17/2019		1.1	1.0	ug/L
Benzene	MW-19	4/07/2020		1.5	1.0	ug/L
Benzene	MW-19	10/07/2020		3.1	1.0	ug/L
Benzene	MW-19	4/16/2021		1.7	1.0	ug/L

Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

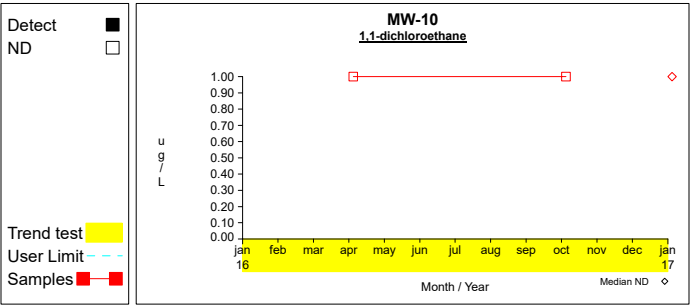
Table 1

Historical Volatile Organic Compound Detections

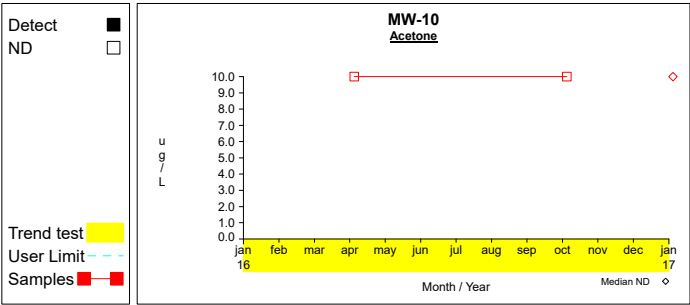
Constituent	Well	Date	Identifier	Result	Limit	Units
Chloroethane	MW-19	10/04/2016		3.2	1.0	ug/L
Chloroethane	MW-19	4/03/2017		2.4	1.0	ug/L
Chloroethane	MW-19	10/03/2017		2.2	1.0	ug/L
Chloroethane	MW-19	4/10/2018		3.5	1.0	ug/L
Chloroethane	MW-19	10/12/2018		2.7	1.0	ug/L
Chloroethane	MW-19	4/17/2019		2.8	1.0	ug/L
Chloroethane	MW-19	9/30/2019		3.2	1.0	ug/L
Chloroethane	MW-19	4/07/2020		2.6	1.0	ug/L
Chloroethane	MW-19	10/07/2020		4.0	1.0	ug/L
Chloroethane	MW-19	4/16/2021		2.1	1.0	ug/L
Chloroethane	MW-19	10/14/2021		2.0	1.0	ug/L
Chloroethane	MW-19	10/04/2022		1.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/04/2016		23.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/03/2017		4.5	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/03/2017		36.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/10/2018		46.2	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/12/2018		34.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/17/2019		43.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	9/30/2019		39.9	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/07/2020		54.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/07/2020		98.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/16/2021		23.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/14/2021		26.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/04/2022		6.6	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/04/2022		7.6	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/13/2023		1.8	1.0	ug/L
Tetrachloroethene	MW-19	10/04/2016		6.6	1.0	ug/L
Tetrachloroethene	MW-19	4/03/2017		43.2	1.0	ug/L
Tetrachloroethene	MW-19	10/12/2018		2.8	1.0	ug/L
Tetrachloroethene	MW-19	4/17/2019		1.9	1.0	ug/L
Tetrachloroethene	MW-19	10/14/2021		1.0	1.0	ug/L
Trichloroethene	MW-19	3/17/2009		8.5	1.0	ug/L
Trichloroethene	MW-19	10/04/2016		2.8	1.0	ug/L
Trichloroethene	MW-19	4/03/2017		7.9	1.0	ug/L
Trichloroethene	MW-19	10/12/2018		5.1	1.0	ug/L
Trichloroethene	MW-19	4/17/2019		3.9	1.0	ug/L
Trichloroethene	MW-19	9/30/2019		11.8	1.0	ug/L
Trichloroethene	MW-19	4/07/2020		2.2	1.0	ug/L
Trichloroethene	MW-19	10/07/2020		2.0	1.0	ug/L
Trichloroethene	MW-19	4/16/2021		10.6	1.0	ug/L
Trichloroethene	MW-19	10/14/2021		3.6	1.0	ug/L
Trichloroethene	MW-19	4/04/2022		2.1	1.0	ug/L
Trichloroethene	MW-19	10/04/2022		5.1	1.0	ug/L
Trichloroethene	MW-19	4/13/2023		2.3	1.0	ug/L
Vinyl chloride	MW-19	10/07/2020		1.2	1.0	ug/L
Xylenes, total	MW-19	4/17/2019		2.4	2.0	ug/L
Xylenes, total	MW-19	10/07/2020		3.0	2.0	ug/L
Acetone	MW-20	10/04/2016		72.9	10.0	ug/L
Acetone	MW-20	4/03/2017		10.4	10.0	ug/L
Acetone	MW-20	10/03/2017		34.0	10.0	ug/L
Acetone	MW-20	4/10/2018		32.9	10.0	ug/L
Acetone	MW-20	10/12/2018		28.7	10.0	ug/L
Acetone	MW-20	4/17/2019		27.2	10.0	ug/L
Acetone	MW-20	10/14/2021		180.0	10.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/04/2016		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/03/2017		1.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/12/2018		6.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/17/2019		3.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	9/30/2019		3.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/07/2020		3.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/07/2020		9.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/16/2021		4.5	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/14/2021		3.9	1.0	ug/L
Tetrachloroethene	MW-20	10/03/2017		1.7	1.0	ug/L
Toluene	MW-20	10/04/2016		6.7	1.0	ug/L
Toluene	MW-20	4/03/2017		1.3	1.0	ug/L
Trichloroethene	MW-20	3/17/2009		1.6	1.0	ug/L
Trichloroethene	MW-20	10/03/2017		2.2	1.0	ug/L
Trichloroethene	MW-20	10/12/2018		3.1	1.0	ug/L
Trichloroethene	MW-20	4/17/2019		1.7	1.0	ug/L
Trichloroethene	MW-20	4/07/2020		1.1	1.0	ug/L

Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

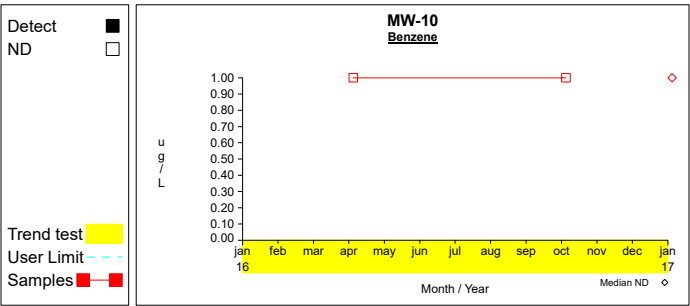
Time Series



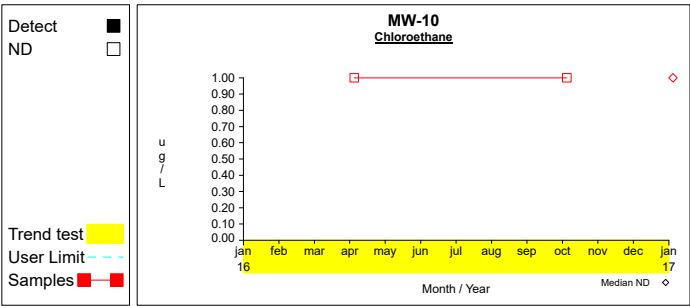
Graph 1



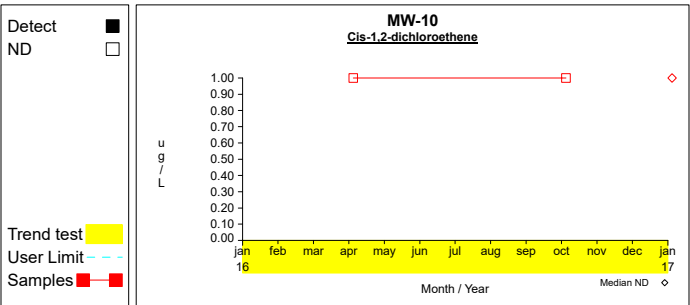
Graph 2



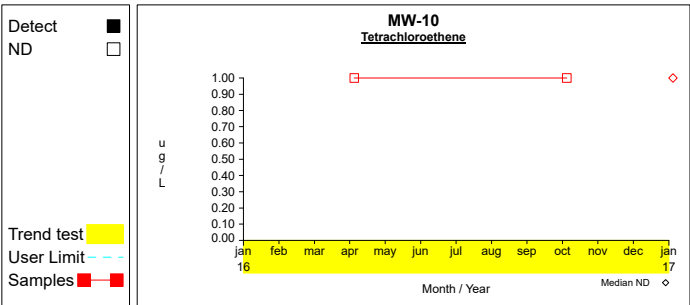
Graph 3



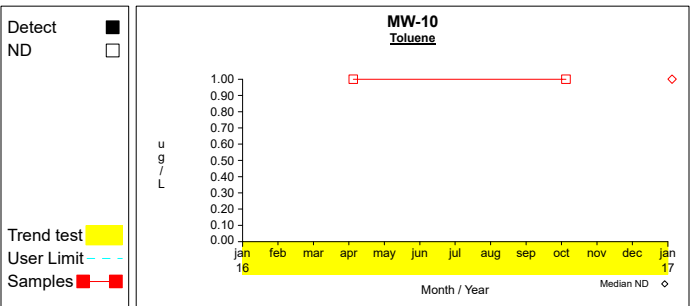
Graph 4



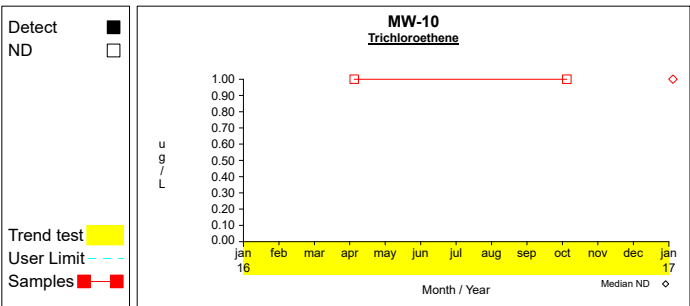
Graph 5



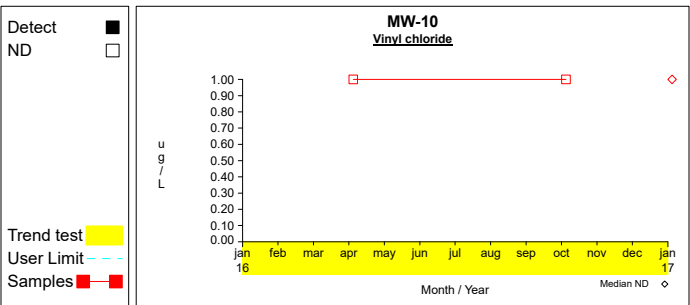
Graph 6



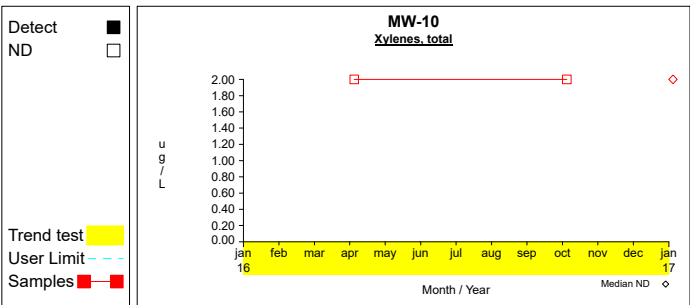
Graph 7



Graph 8

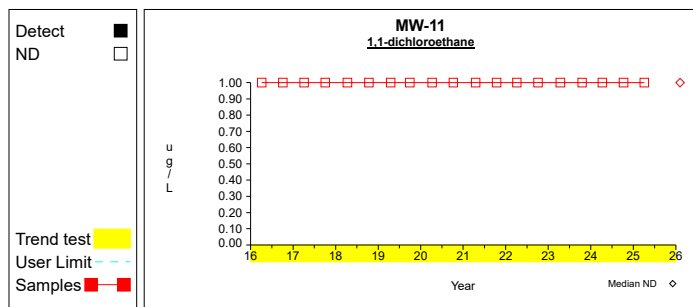


Graph 9

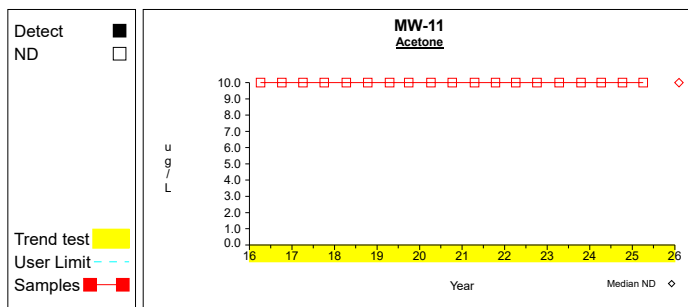


Graph 10

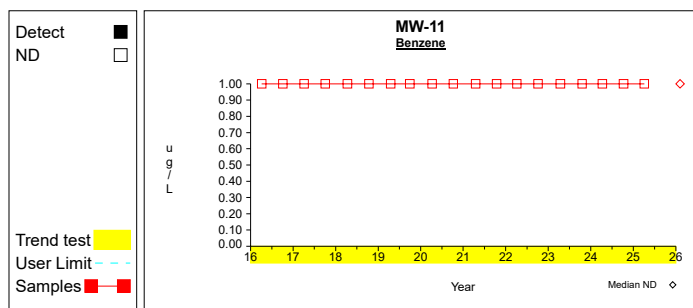
Time Series



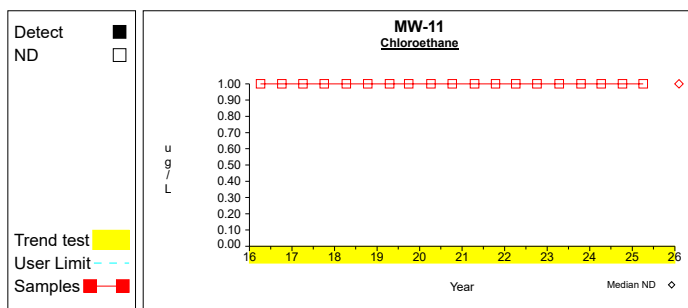
Graph 11



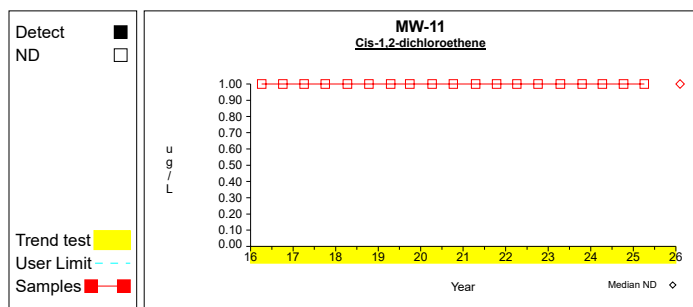
Graph 12



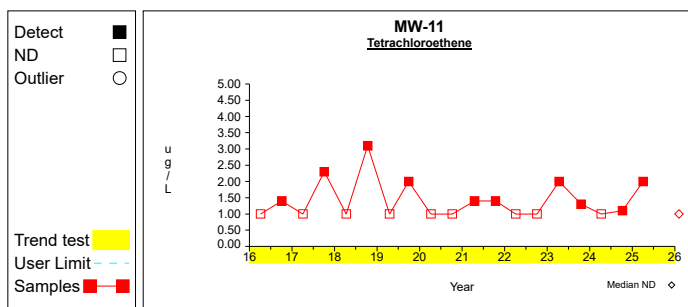
Graph 13



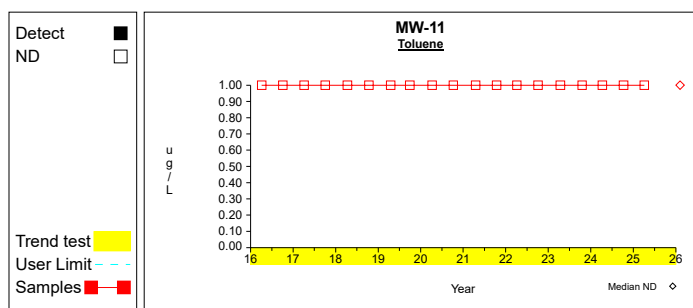
Graph 14



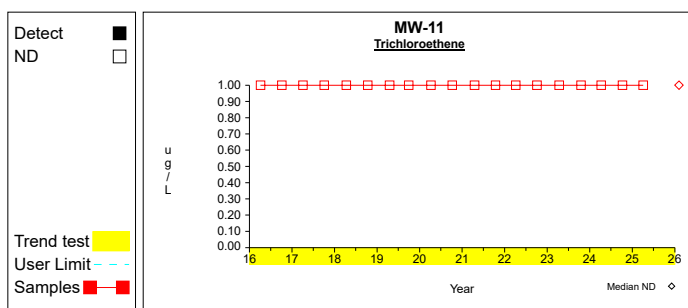
Graph 15



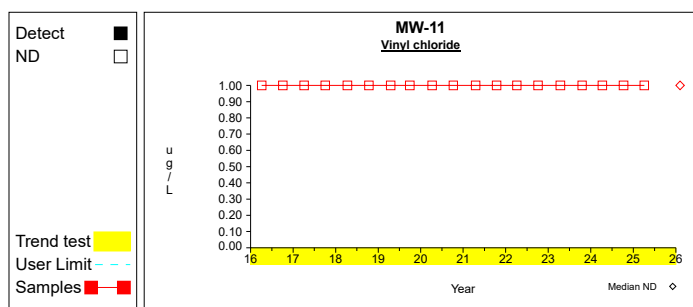
Graph 16



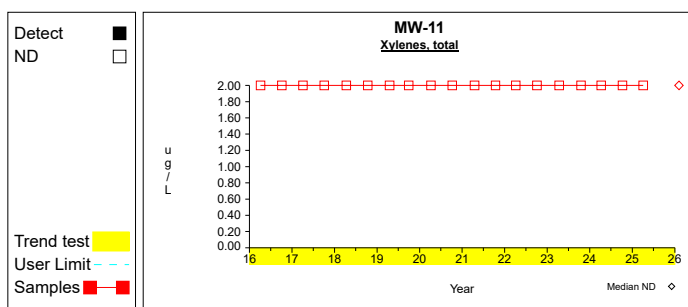
Graph 17



Graph 18

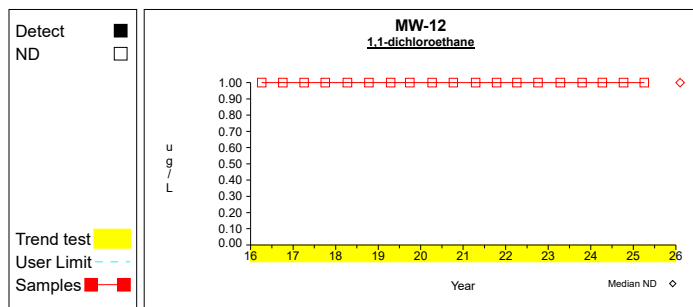


Graph 19

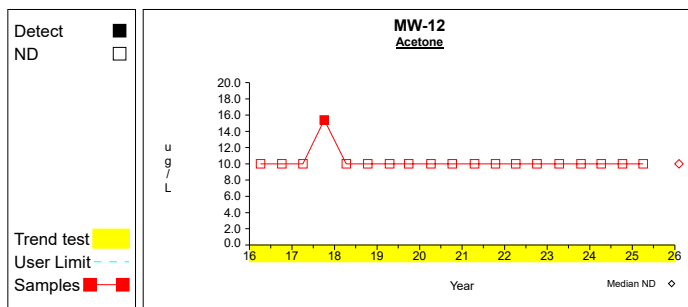


Graph 20

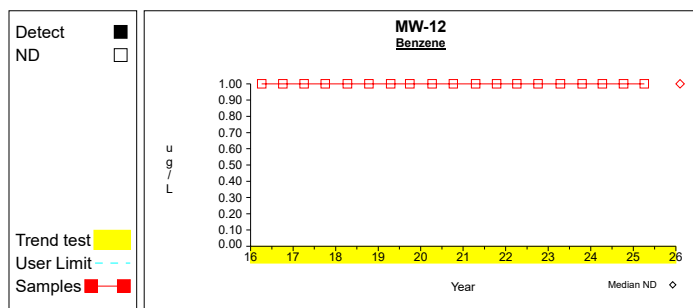
Time Series



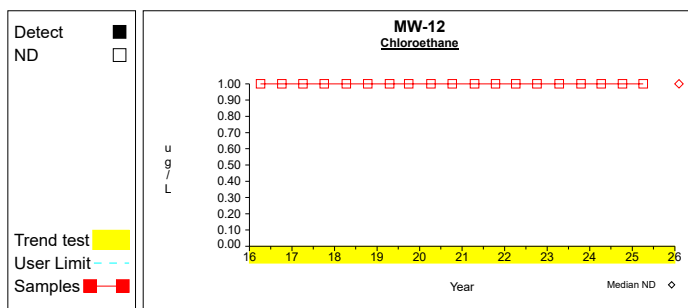
Graph 21



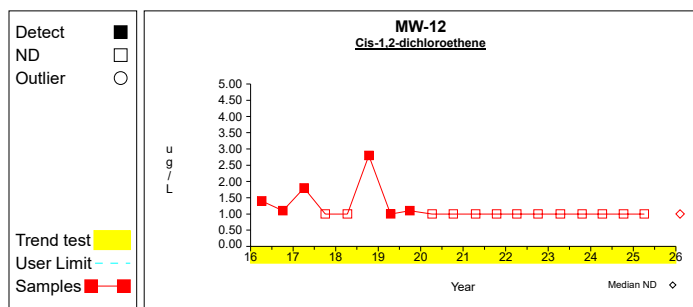
Graph 22



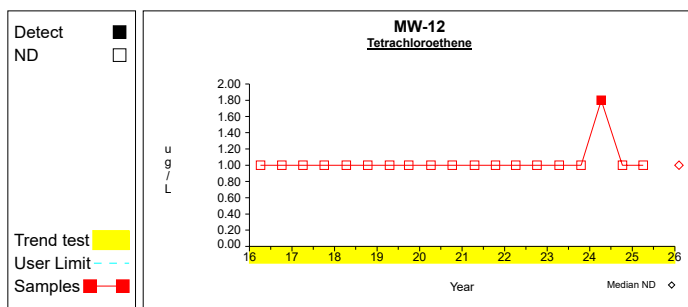
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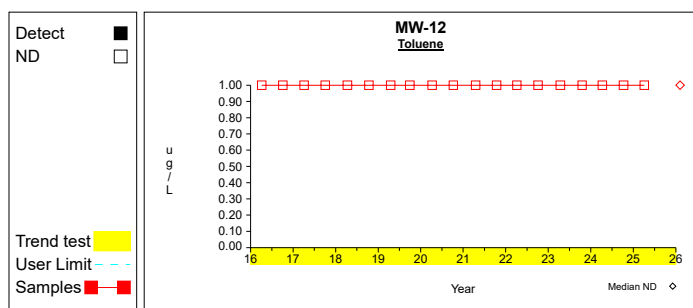
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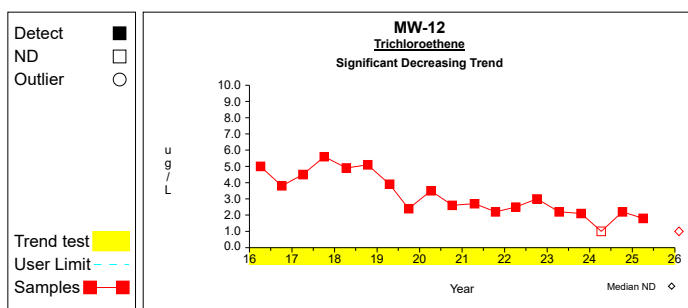
Graph 25



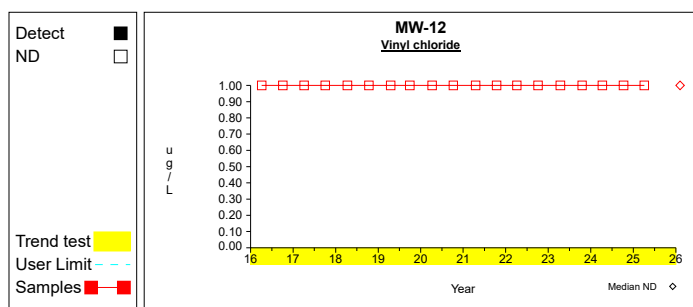
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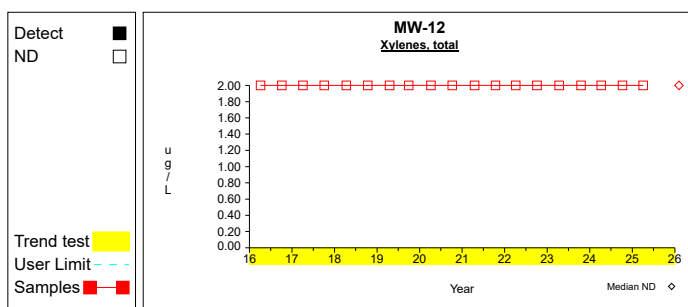
Graph 27



Graph 28

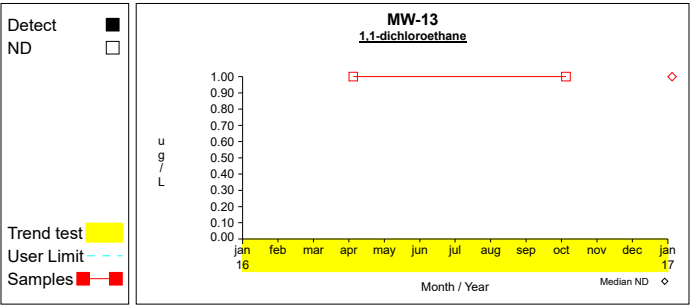


Graph 29

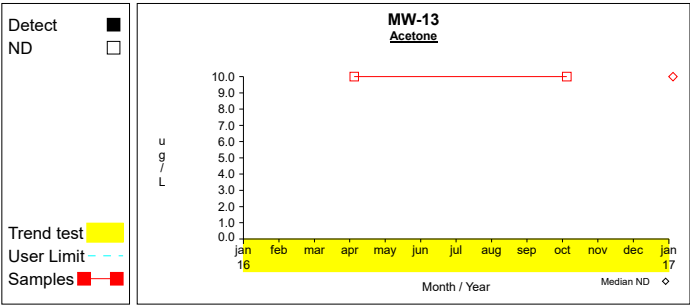


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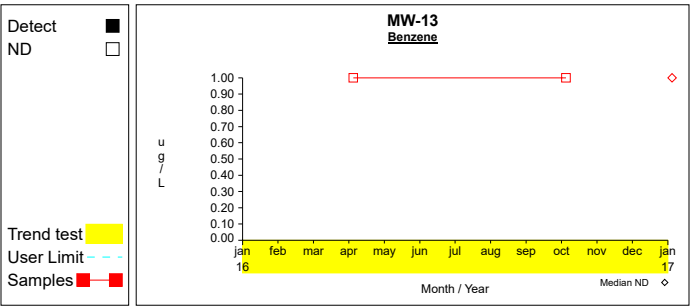
Time Series



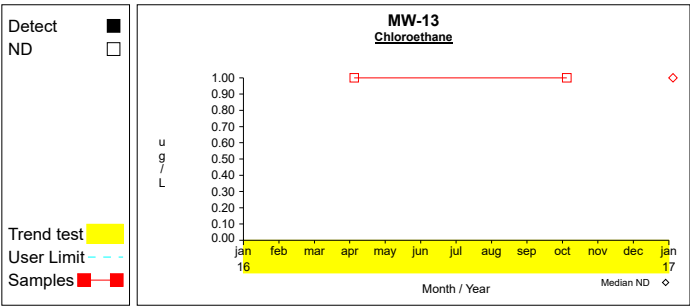
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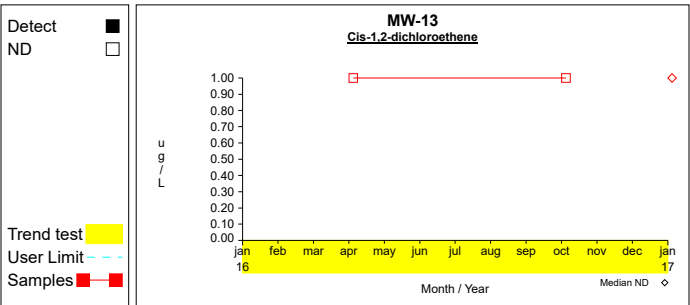
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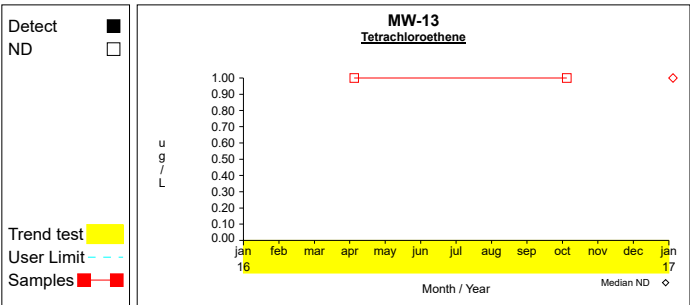
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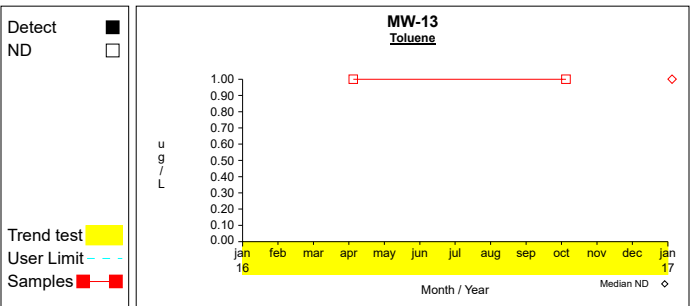
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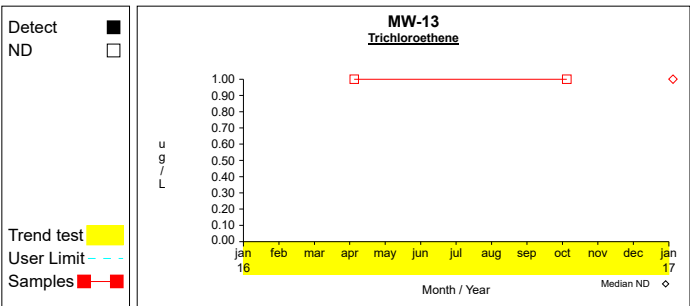
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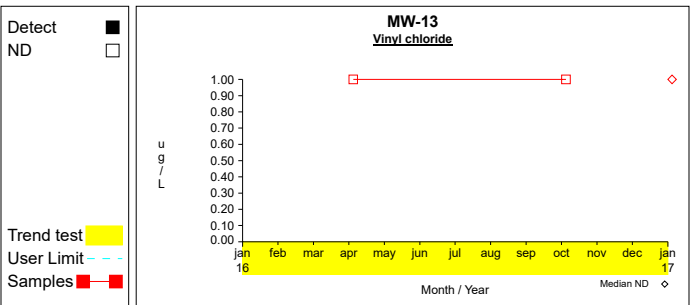
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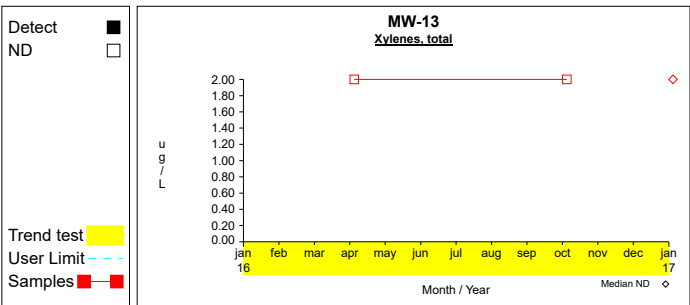
Graph 37



Graph 38

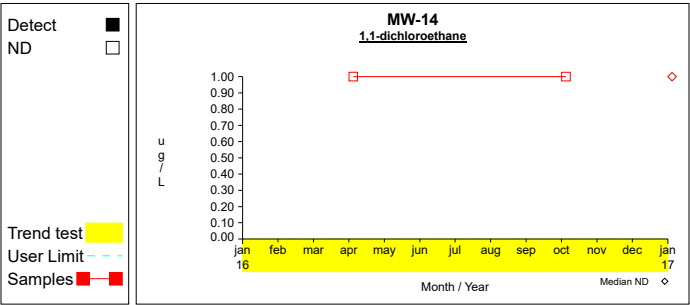


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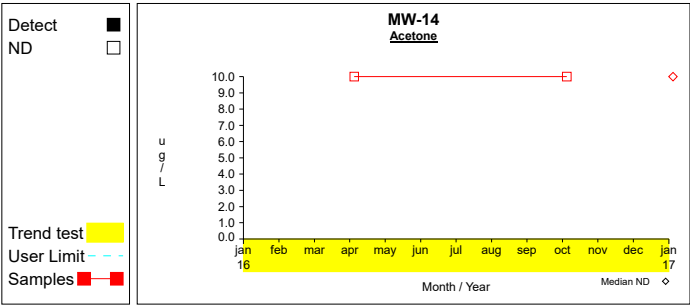


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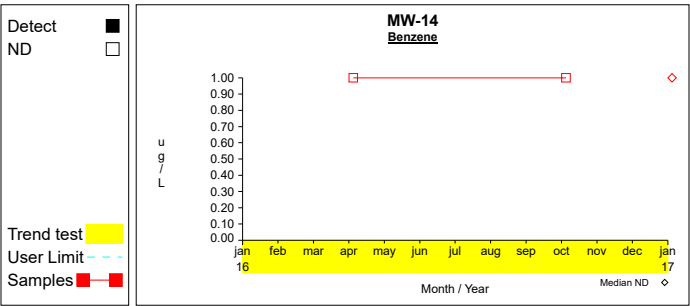
Time Series



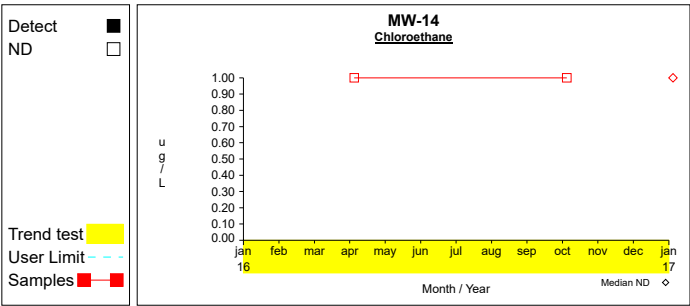
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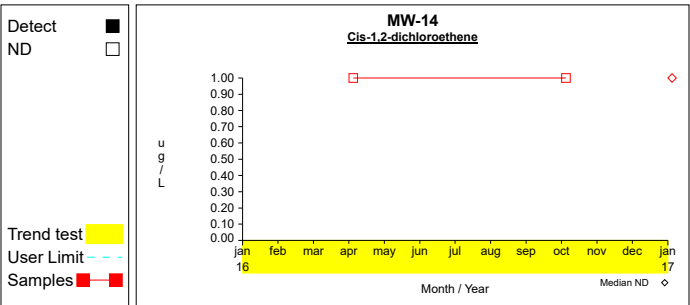
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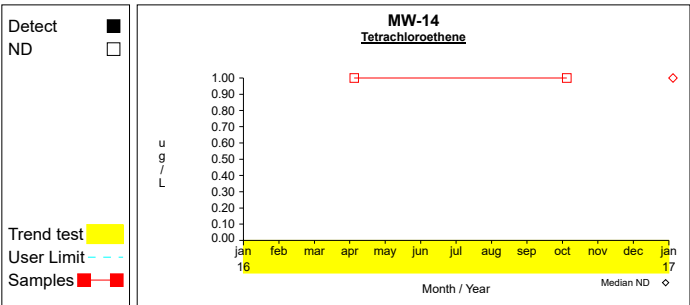
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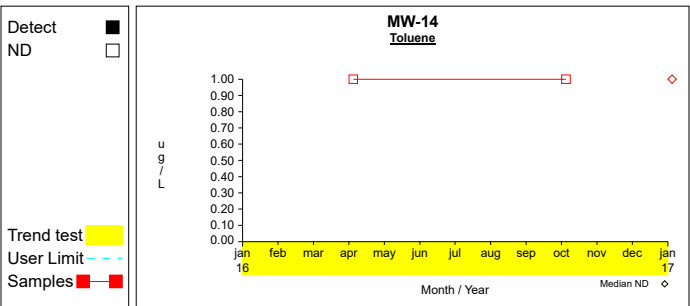
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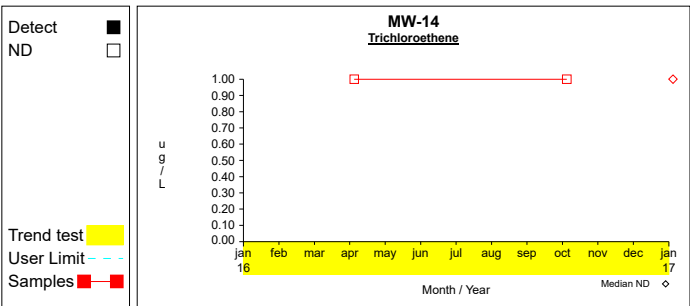
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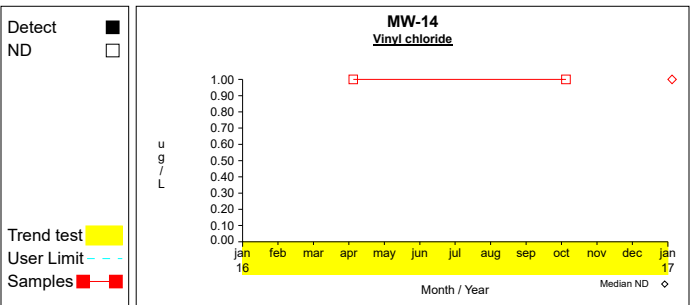
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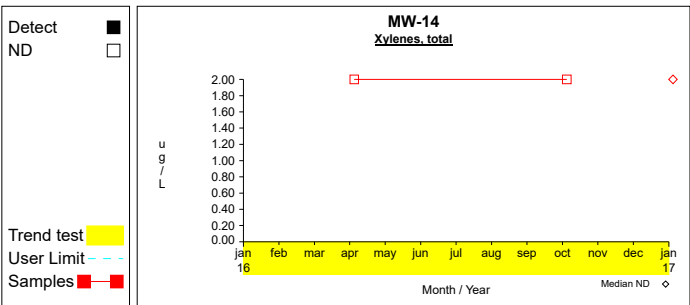
Graph 47



Graph 48

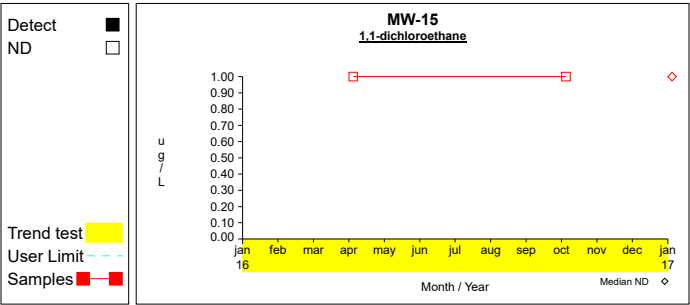


Graph 49

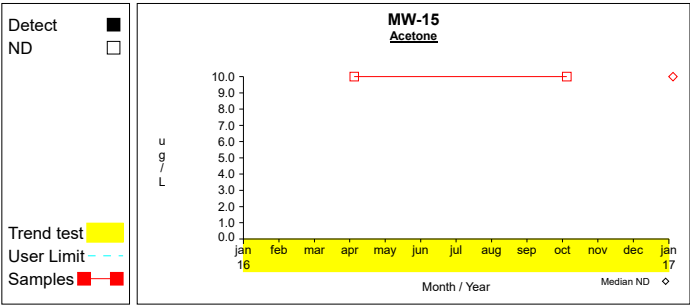


Graph 50

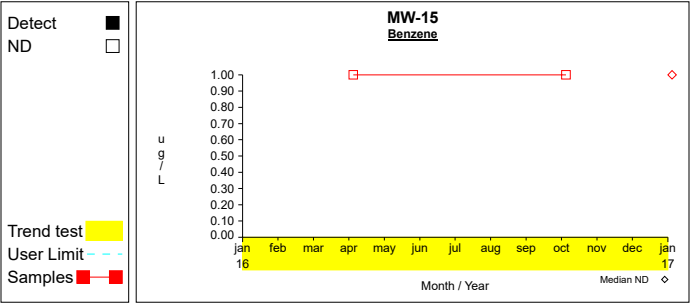
Time Series



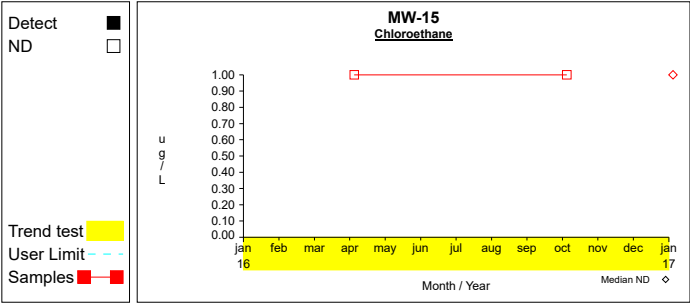
Graph 51



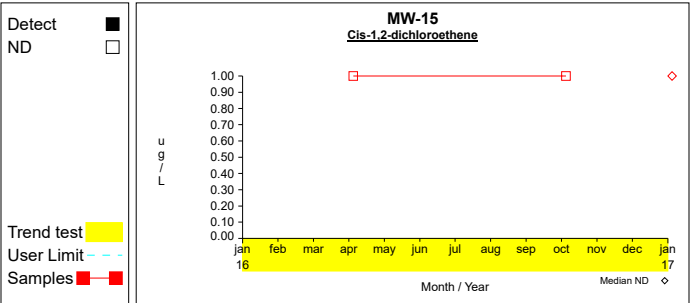
Graph 52



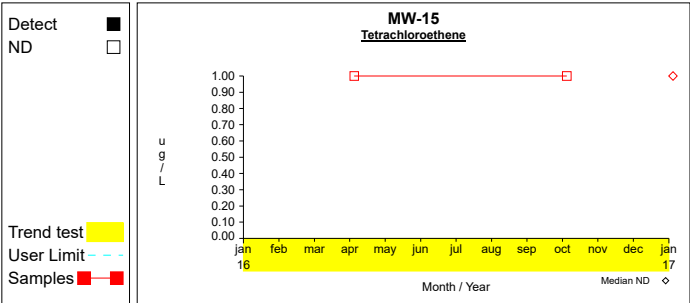
Graph 53



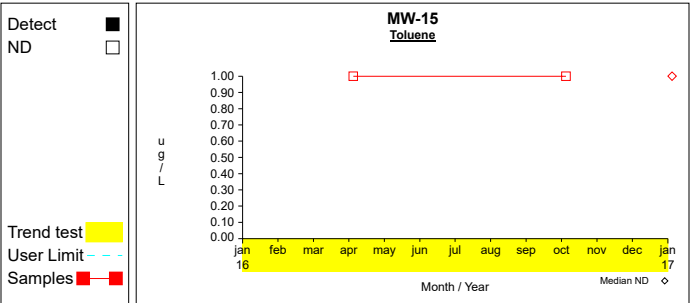
Graph 54



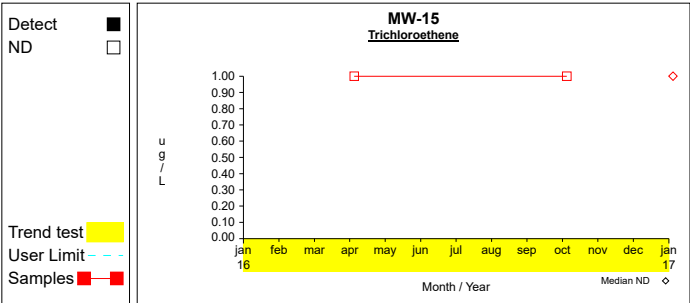
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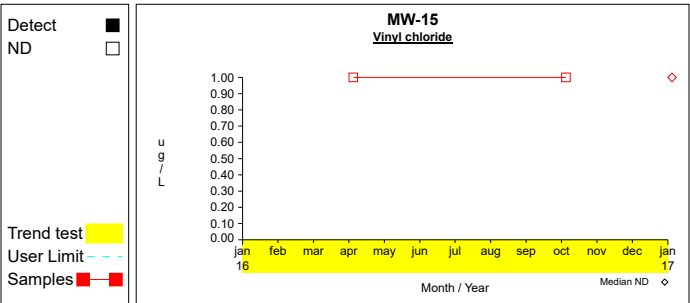
Graph 56



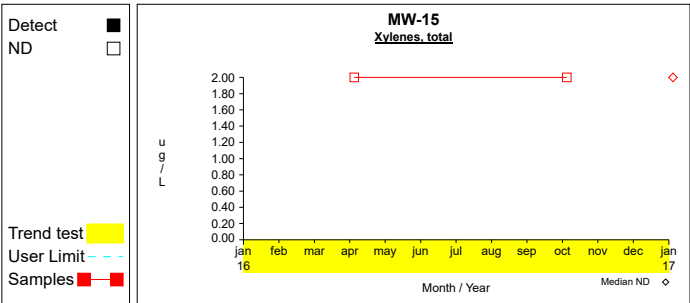
Graph 57



Graph 58

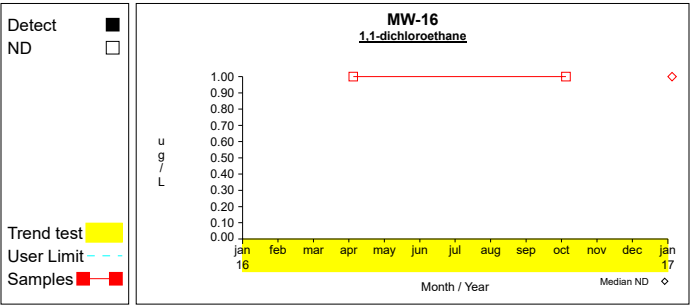


Graph 59

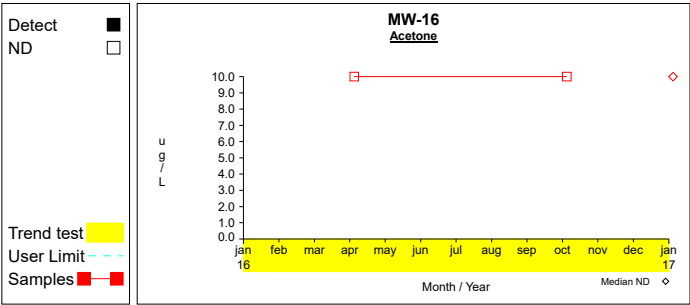


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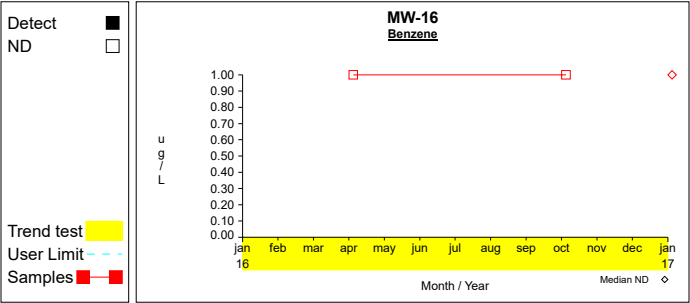
Time Series



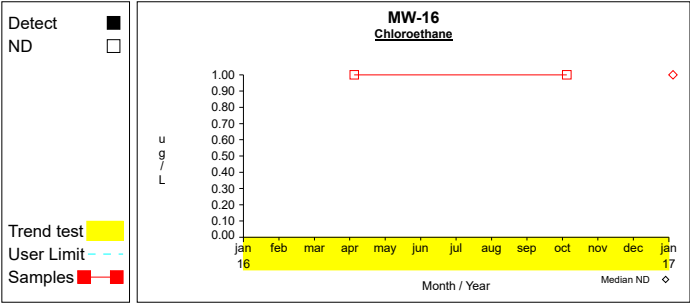
Graph 61



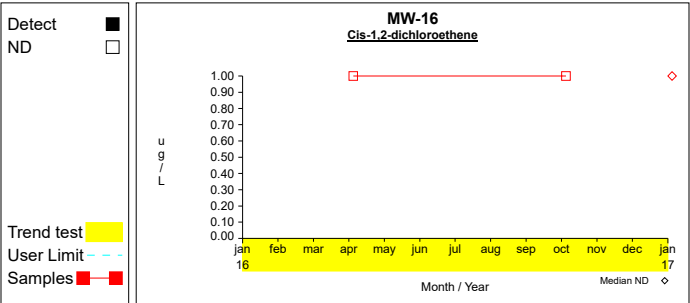
Graph 62



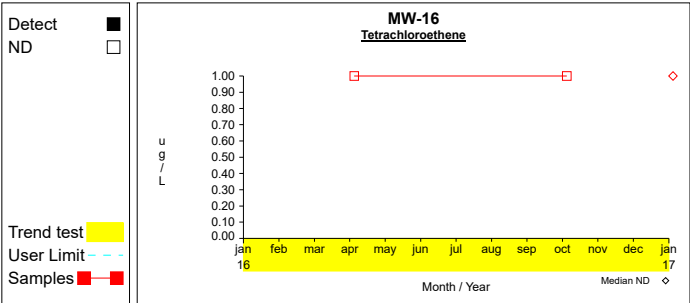
Graph 63



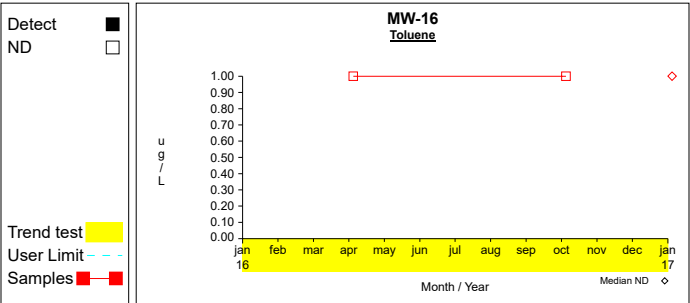
Graph 64



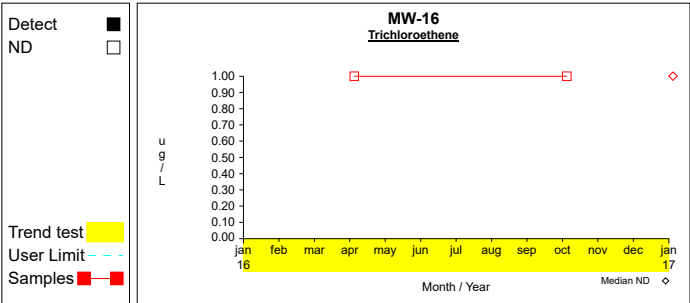
Graph 65



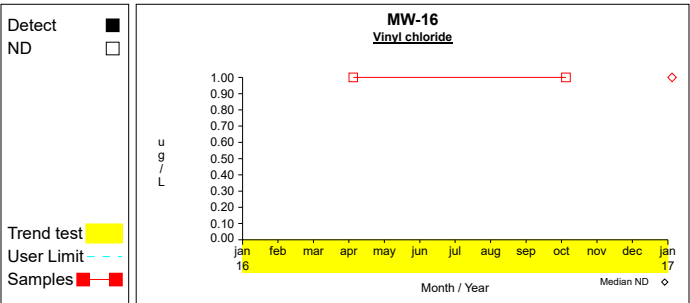
Graph 66



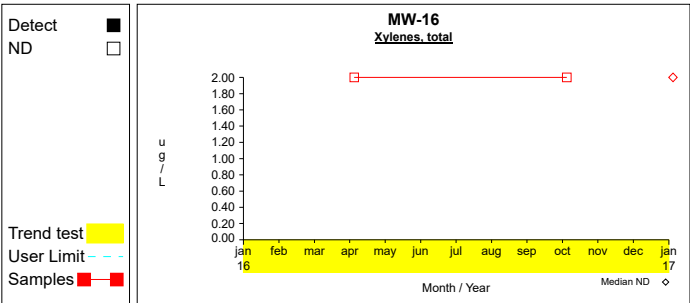
Graph 67



Graph 68

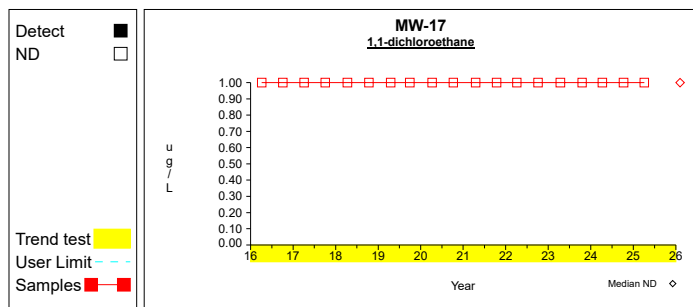


Graph 69

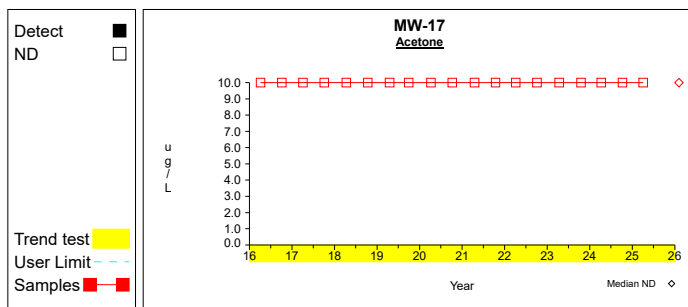


Graph 70

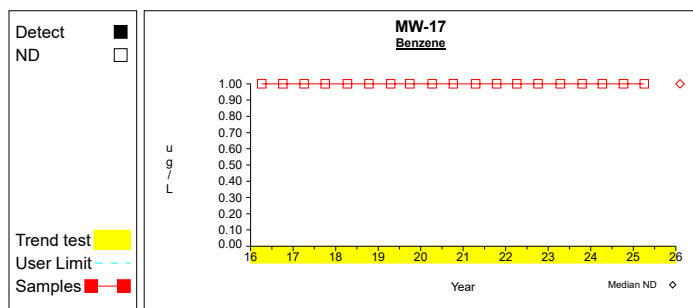
Time Series



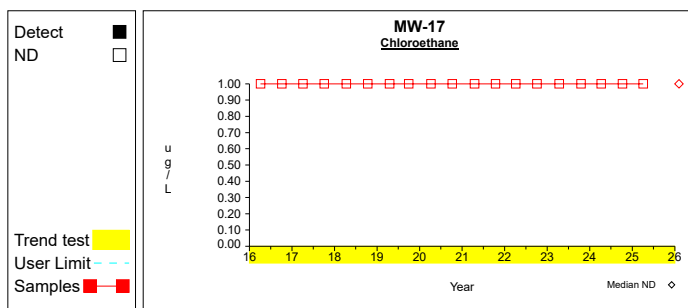
Graph 71



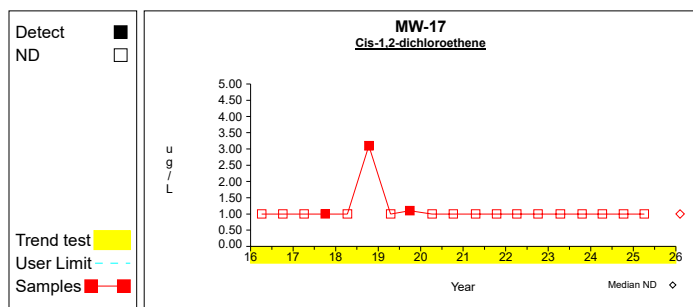
Graph 72



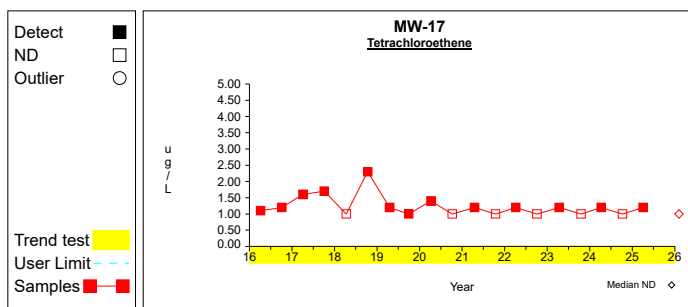
Graph 73



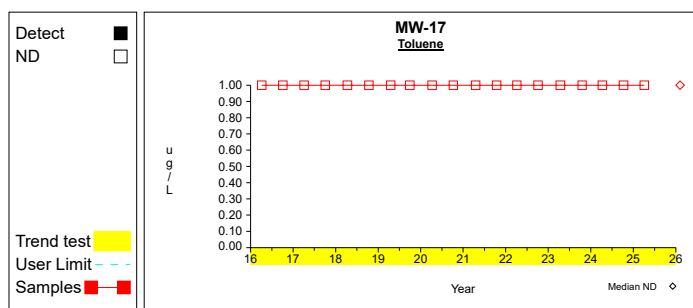
Graph 74



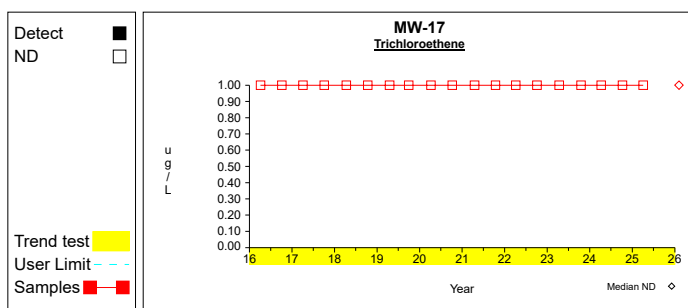
Graph 75



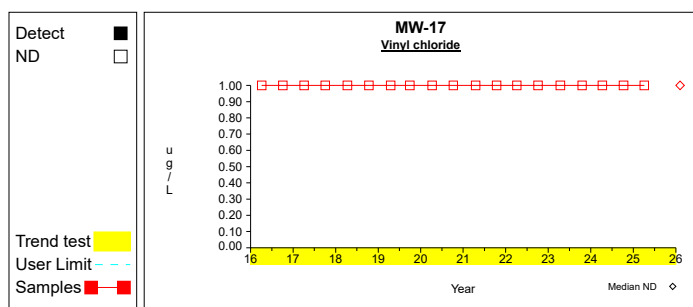
Graph 76



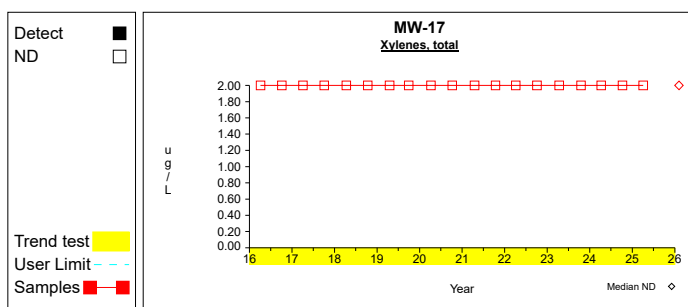
Graph 77



Graph 78

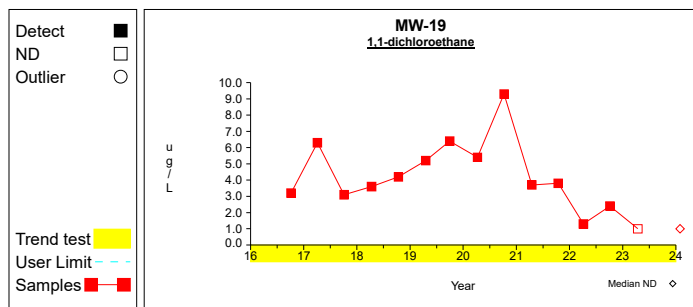


Graph 79

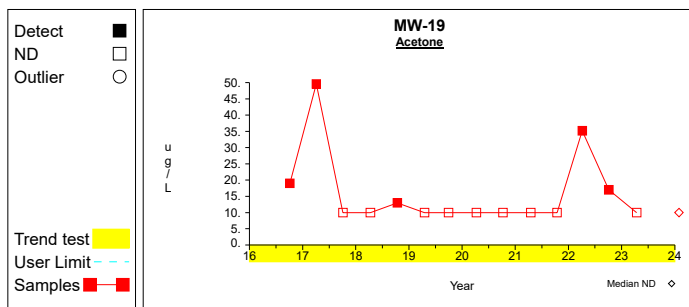


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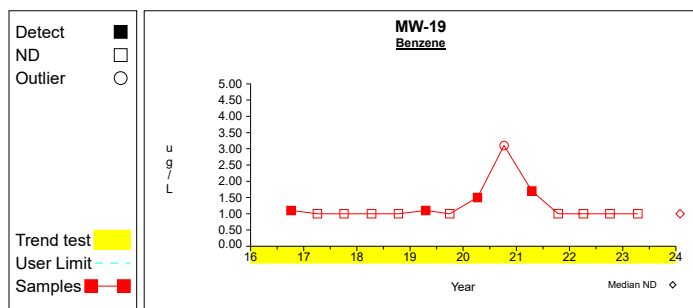
Time Series



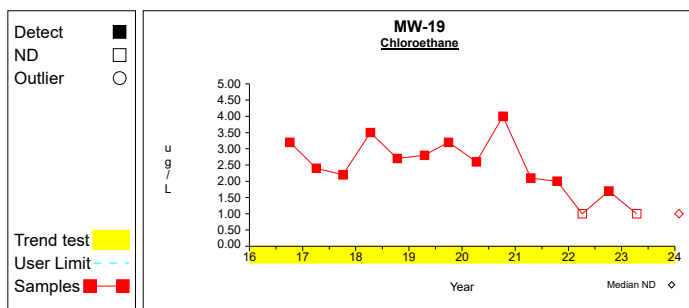
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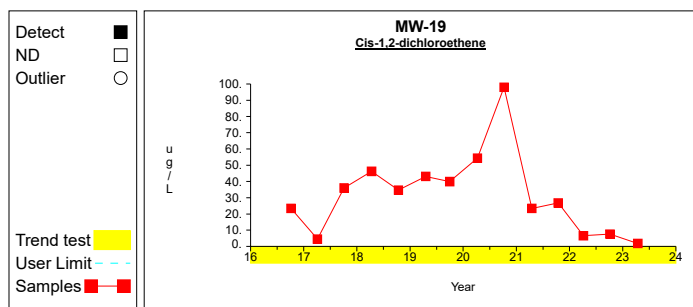
Graph 82



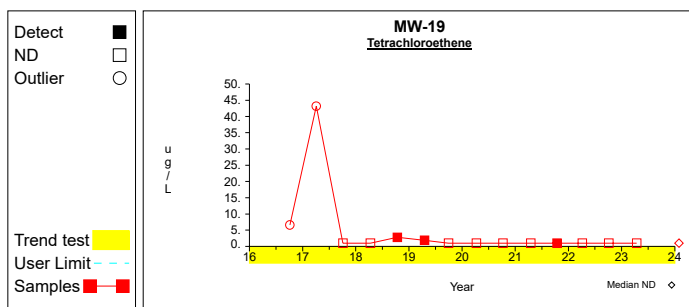
Graph 83



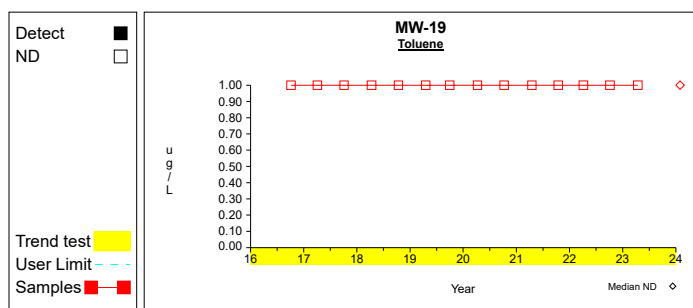
Graph 84



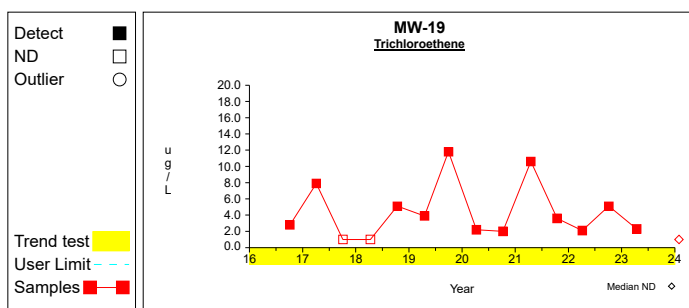
Graph 85



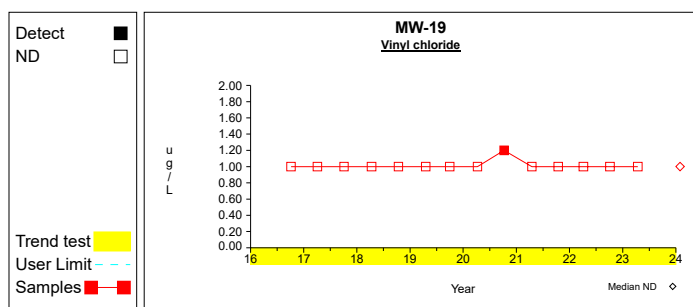
Graph 86



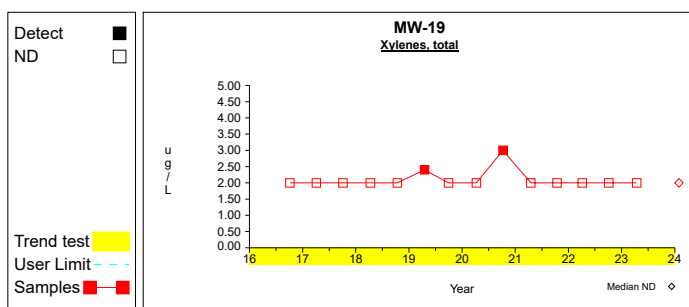
Graph 87



Graph 88

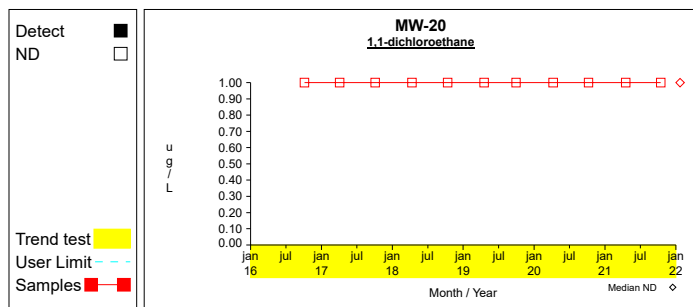


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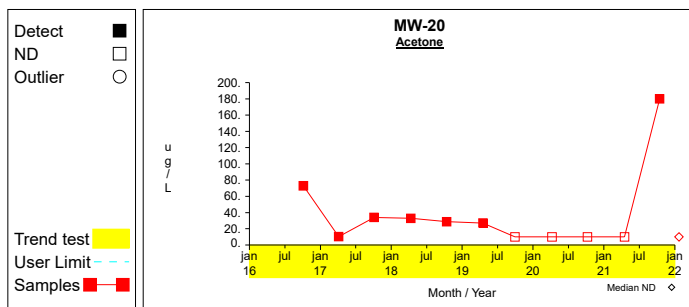


Graph 90

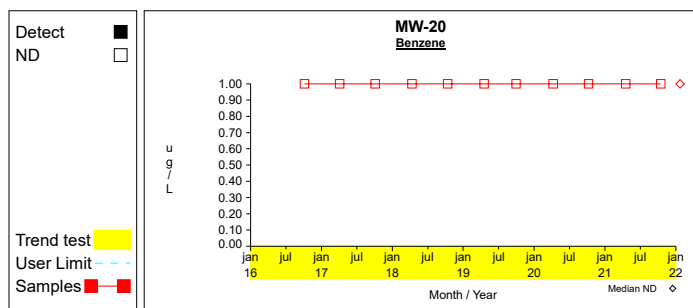
Time Series



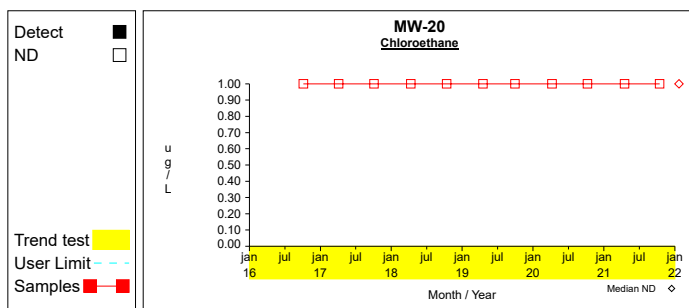
Graph 91



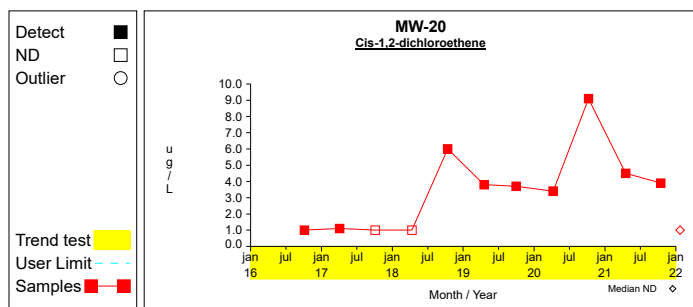
Graph 92



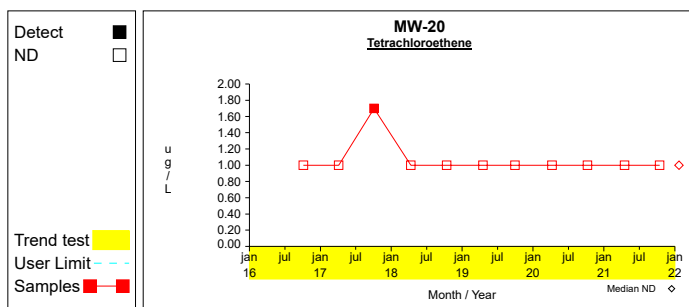
Graph 93



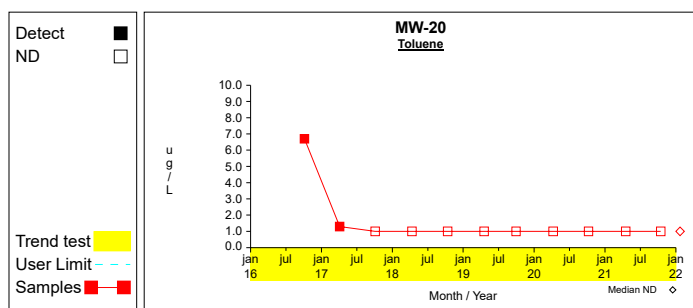
Graph 94



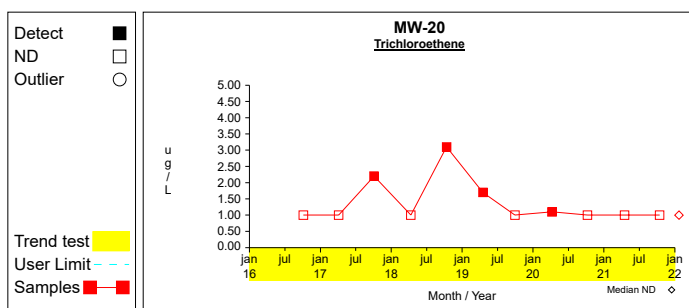
Graph 95



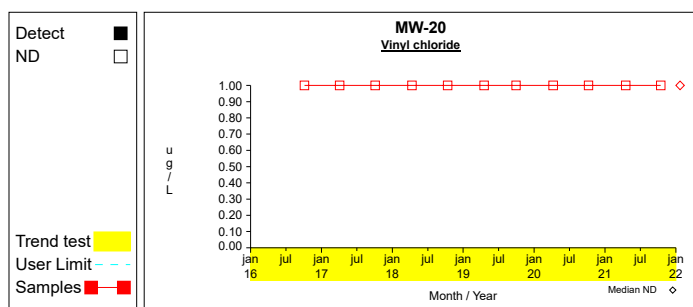
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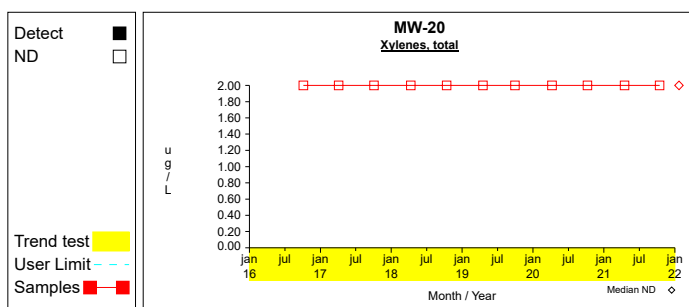
Graph 97



Graph 98

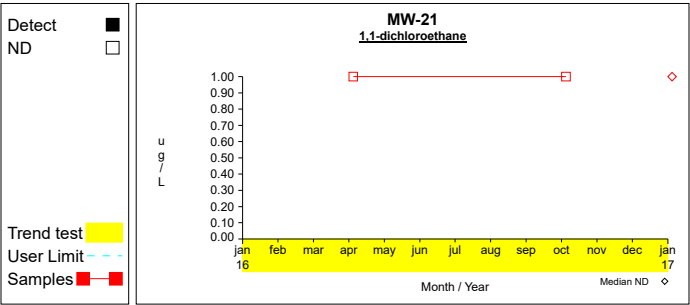


Graph 99

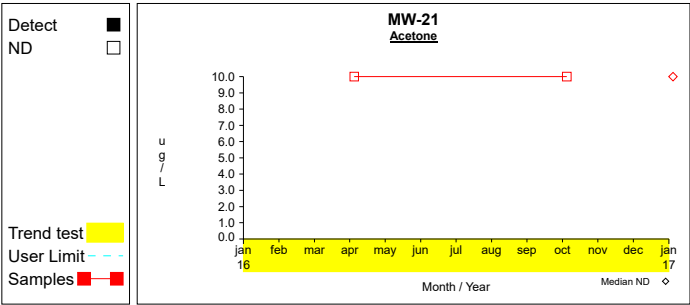


Graph 100

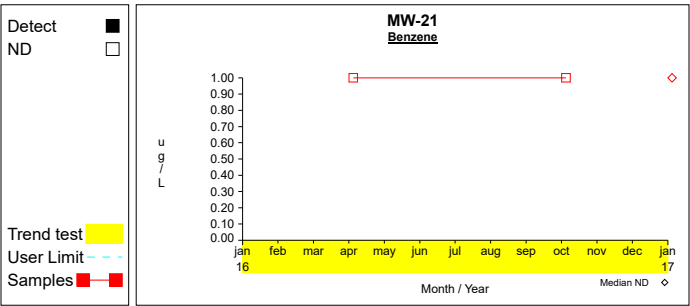
Time Series



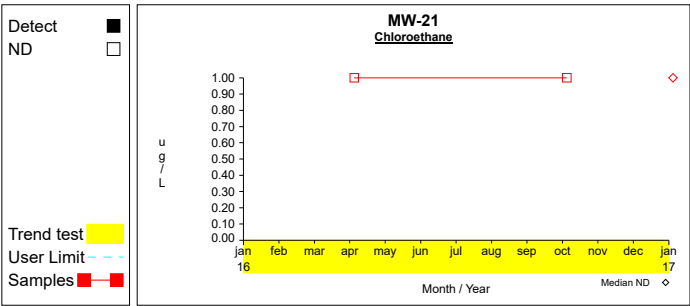
Graph 101



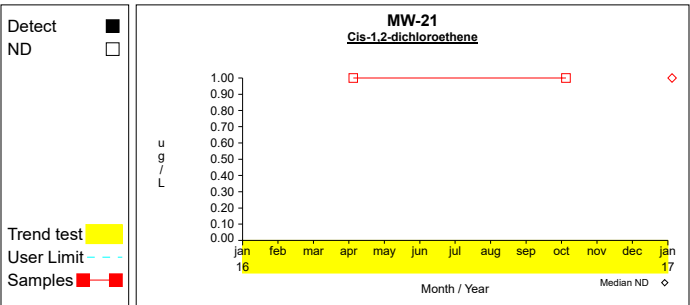
Graph 102



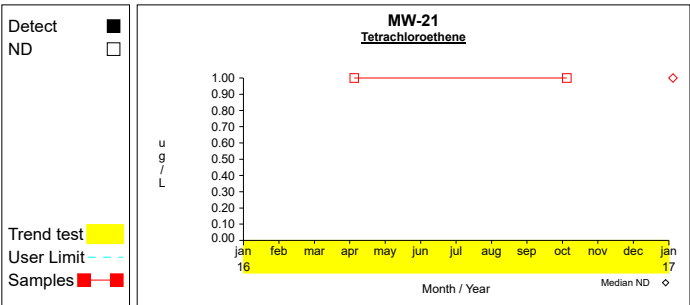
Graph 103



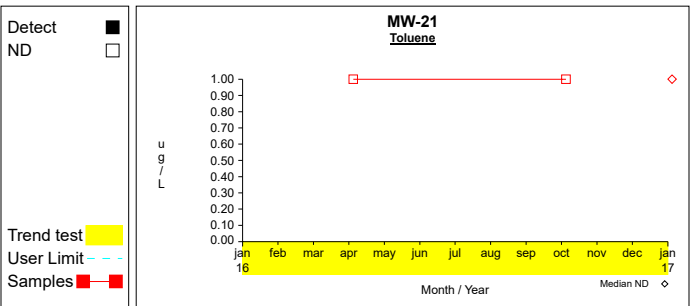
Graph 104



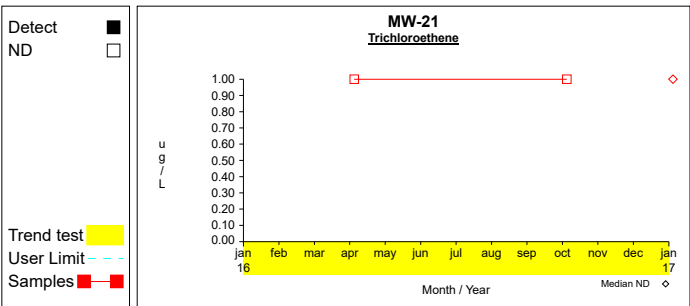
Graph 105



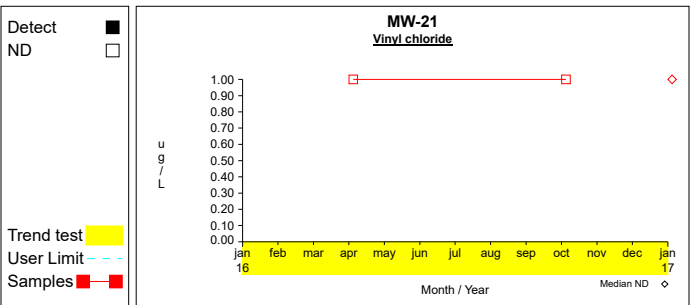
Graph 106



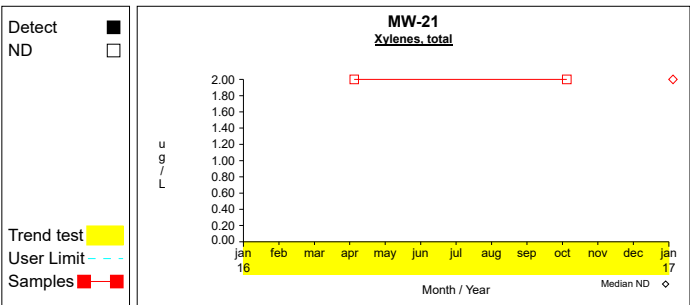
Graph 107



Graph 108



Graph 109



Graph 110

Attachment C

Assessment Statistics for VOCs

Table 1

**Confidence Intervals for Comparing the Mean of the Last
4 Measurements to an Assessment Monitoring Standard**

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	Trend
Tetrachloroethene	ug/L	MW-11	4	1.225	0.618	1.176	0.498	1.952	5.000	
Trichloroethene	ug/L	MW-11	4	0.500	0.000	1.176	0.500	0.500	5.000	
Tetrachloroethene	ug/L	MW-12	4	0.825	0.650	1.176	0.060	1.590	5.000	
Trichloroethene	ug/L	MW-12	4	1.650	0.785	1.176	0.726	2.574	5.000	dec
Tetrachloroethene	ug/L	MW-17	4	0.850	0.404	1.176	0.375	1.325	5.000	
Trichloroethene	ug/L	MW-17	4	0.500	0.000	1.176	0.500	0.500	5.000	

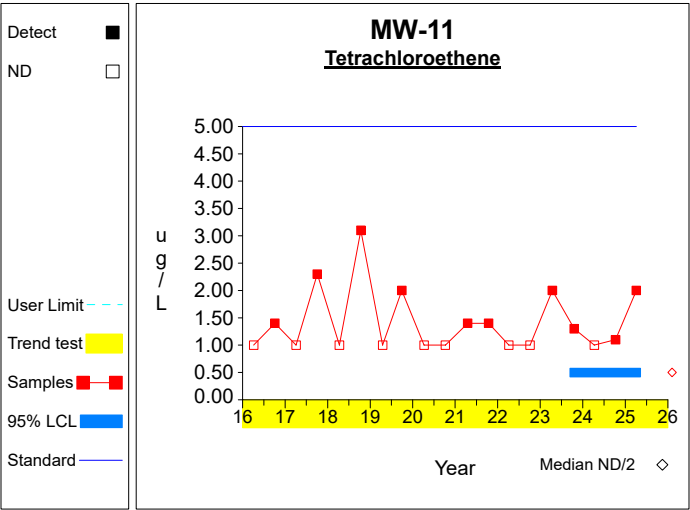
* - Insufficient Data

** - Significant Exceedance

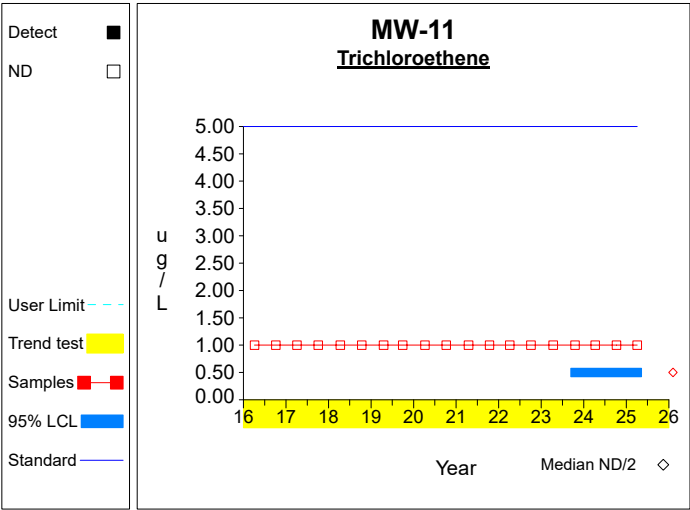
LCL = Lower Confidence Limit

UCL = Upper Confidence Limit

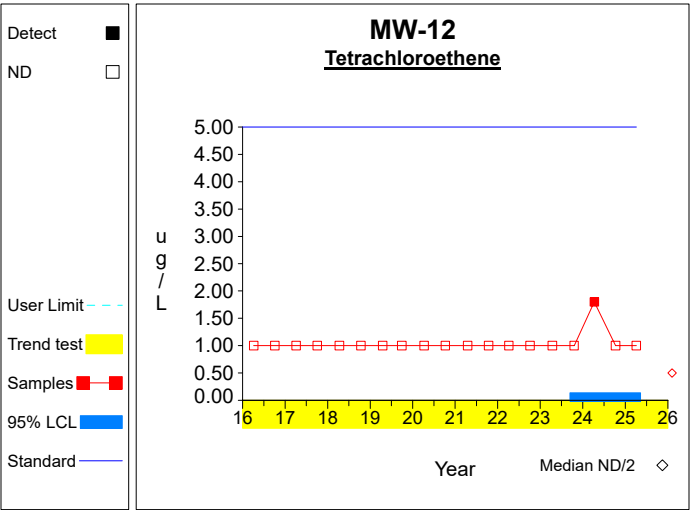
Confidence Limits (Assessment)



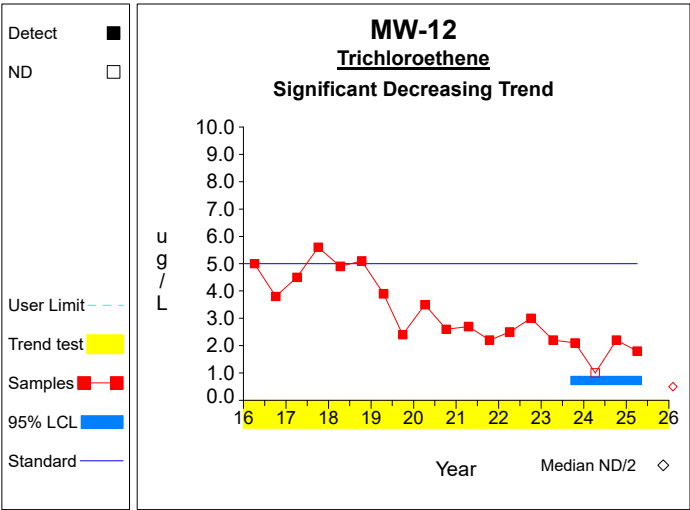
Graph 1



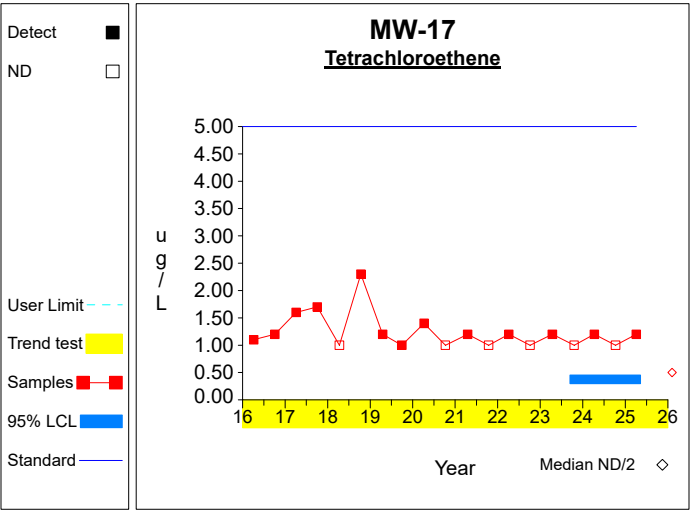
Graph 2



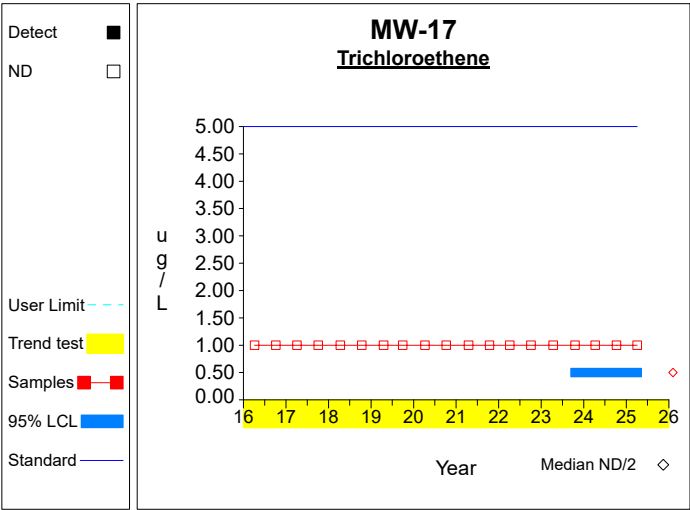
Graph 3



Graph 4



Graph 5



Graph 6

Worksheet 6 - Assessment Monitoring
Tetrachloroethene (ug/L) at MW-11

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 4.9 / 4$ $= 1.225$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((7.15 - 24.01/4) / (4-1))^{1/2}$ $= 0.618$	Compute sd of the last 4 measurements.
3	$LCL = \bar{X} - tS/N^{1/2}$ $= 1.225 - 2.353 * 0.618/4^{1/2}$ $= 0.498$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$UCL = \bar{X} + tS/N^{1/2}$ $= 1.225 + 2.353 * 0.618/4^{1/2}$ $= 1.952$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = 0.0$	Sen's estimator of trend.
7	$\text{var}(S) = 717.667$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 717.667^{1/2}) / 2$ $= [50.995, 120.005]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [-0.151, 0.179]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Trichloroethene (ug/L) at MW-11

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 2.0 / 4$ $= 0.5$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((1.0 - 4.0/4) / (4-1))^{1/2}$ $= 0.0$	Compute sd of the last 4 measurements.
3	$\text{LCL} = \bar{X} - tS/N^{1/2}$ $= 0.5 - 2.353 * 0.0/4^{1/2}$ $= 0.5$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$\text{UCL} = \bar{X} + tS/N^{1/2}$ $= 0.5 + 2.353 * 0.0/4^{1/2}$ $= 0.5$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = 0.0$	Sen's estimator of trend.
7	$\text{var}(S) = 0.0$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 0.0^{1/2}) / 2$ $= [85.5, 85.5]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$\text{CL}(S) = [0.0, 0.0]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Tetrachloroethene (ug/L) at MW-12

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 3.3 / 4$ $= 0.825$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((3.99 - 10.89/4) / (4-1))^{1/2}$ $= 0.65$	Compute sd of the last 4 measurements.
3	$\text{LCL} = \bar{X} - tS/N^{1/2}$ $= 0.825 - 2.353 * 0.65/4^{1/2}$ $= 0.06$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$\text{UCL} = \bar{X} + tS/N^{1/2}$ $= 0.825 + 2.353 * 0.65/4^{1/2}$ $= 1.59$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = 0.0$	Sen's estimator of trend.
7	$\text{var}(S) = 120.0$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 120.0^{1/2}) / 2$ $= [71.391, 99.609]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$\text{CL}(S) = [0.0, 0.0]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Trichloroethene (ug/L) at MW-12

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 6.6 / 4$ $= 1.65$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((12.74 - 43.56/4) / (4-1))^{1/2}$ $= 0.785$	Compute sd of the last 4 measurements.
3	$\text{LCL} = \bar{X} - tS/N^{1/2}$ $= 1.65 - 2.353 * 0.785/4^{1/2}$ $= 0.726$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$\text{UCL} = \bar{X} + tS/N^{1/2}$ $= 1.65 + 2.353 * 0.785/4^{1/2}$ $= 2.574$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = -0.399$	Sen's estimator of trend.
7	$\text{var}(S) = 813.333$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 813.333^{1/2}) / 2$ $= [48.768, 122.232]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$\text{CL}(S) = [-0.601, -0.205]$	Two-sided confidence interval for slope.
10	$\text{UCL}(S) < 0$	Significant decreasing trend.

Worksheet 6 - Assessment Monitoring
Tetrachloroethene (ug/L) at MW-17

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 3.4 / 4$ $= 0.85$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((3.38 - 11.56/4) / (4-1))^{1/2}$ $= 0.404$	Compute sd of the last 4 measurements.
3	$\text{LCL} = \bar{X} - tS/N^{1/2}$ $= 0.85 - 2.353 * 0.404/4^{1/2}$ $= 0.375$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$\text{UCL} = \bar{X} + tS/N^{1/2}$ $= 0.85 + 2.353 * 0.404/4^{1/2}$ $= 1.325$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = -0.029$	Sen's estimator of trend.
7	$\text{var}(S) = 744.333$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 744.333^{1/2}) / 2$ $= [50.36, 120.64]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$\text{CL}(S) = [-0.173, 0.0]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

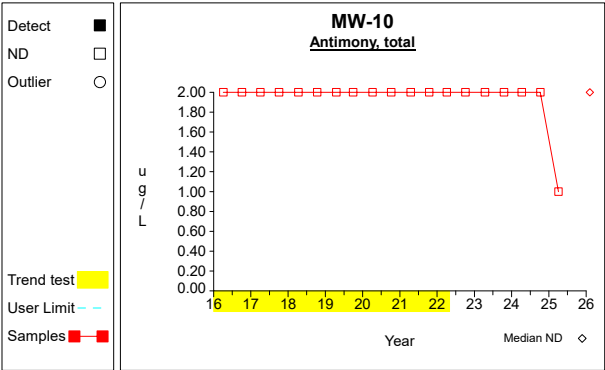
Worksheet 6 - Assessment Monitoring
Trichloroethene (ug/L) at MW-17

<u>Step</u>	<u>Equation</u>	<u>Description</u>
1	$\bar{X} = \text{sum}[X] / N$ $= 2.0 / 4$ $= 0.5$	Compute the mean of the last 4 measurements.
2	$S = ((\text{sum}[X^2] - \text{sum}[X]^2/N) / (N-1))^{1/2}$ $= ((1.0 - 4.0/4) / (4-1))^{1/2}$ $= 0.0$	Compute sd of the last 4 measurements.
3	$\text{LCL} = \bar{X} - tS/N^{1/2}$ $= 0.5 - 2.353 * 0.0/4^{1/2}$ $= 0.5$	Compute lower confidence limit for the mean of the last 4 measurements.
4	$\text{UCL} = \bar{X} + tS/N^{1/2}$ $= 0.5 + 2.353 * 0.0/4^{1/2}$ $= 0.5$	Compute upper confidence limit for the mean of the last 4 measurements.
5	$N' = N * (N-1) / 2$ $= 19 * (19-1) / 2$ $= 171$	Number of sample pairs during trend detection period.
6	$S = 0.0$	Sen's estimator of trend.
7	$\text{var}(S) = 0.0$	Variance estimate for slope.
8	$M(S) = (N' \pm Z_{.995} * \text{var}(S)^{1/2}) / 2$ $= (171 \pm 2.576 * 0.0^{1/2}) / 2$ $= [85.5, 85.5]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M th largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$\text{CL}(S) = [0.0, 0.0]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

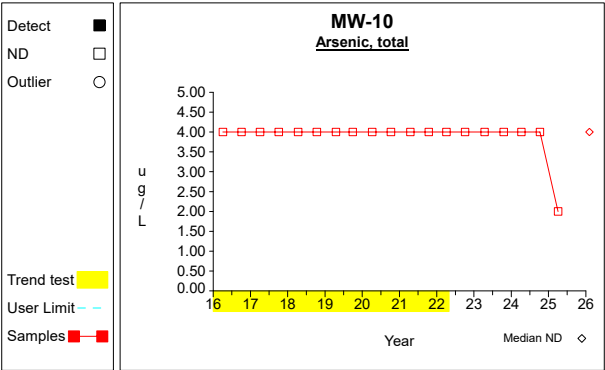
Attachment D

Time Series Plots of Trace Metals Data

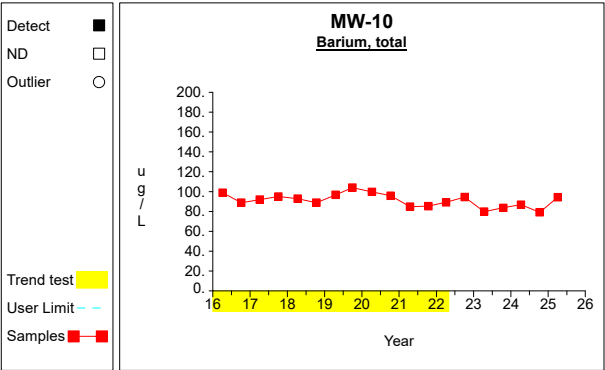
Time Series



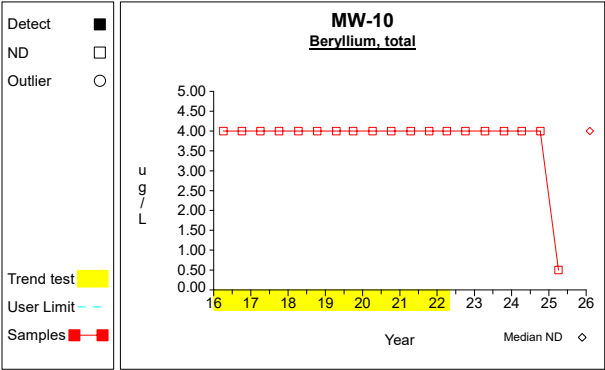
Graph 1



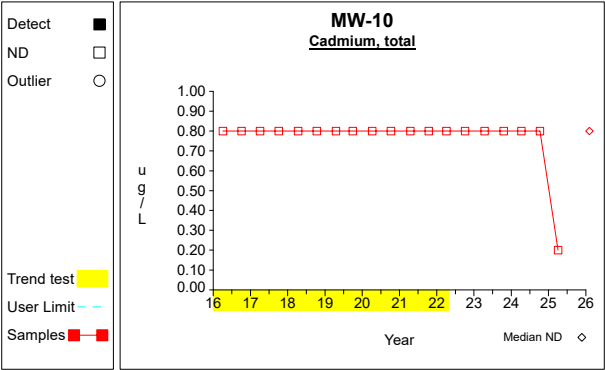
Graph 2



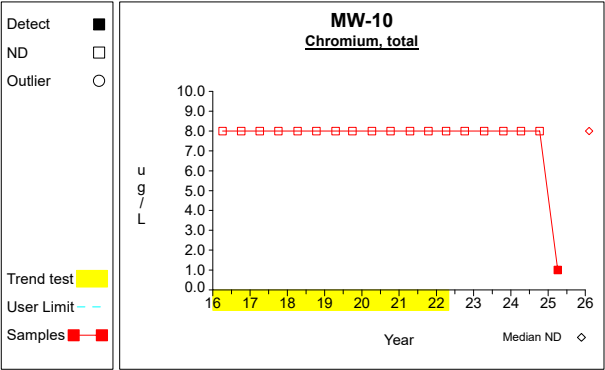
Graph 3



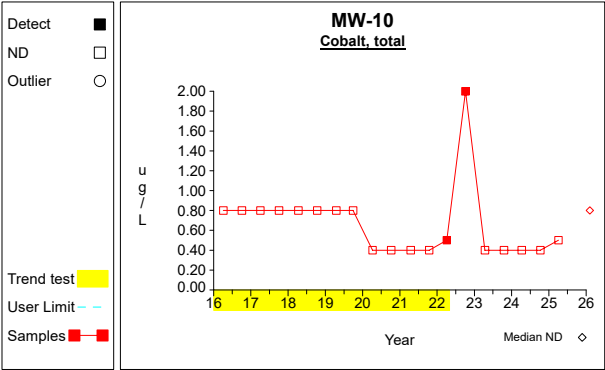
Graph 4



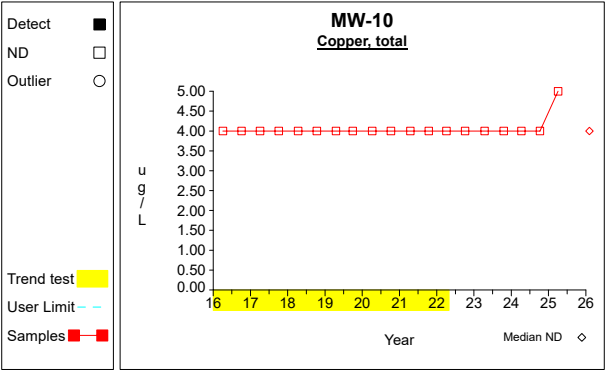
Graph 5



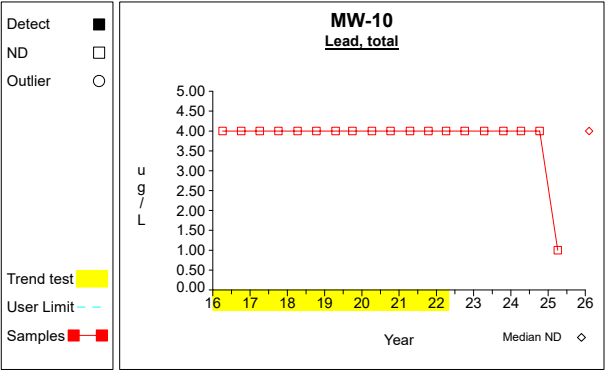
Graph 6



Graph 7

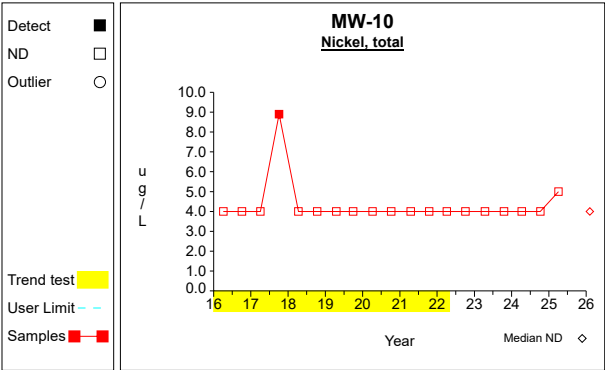


Graph 8

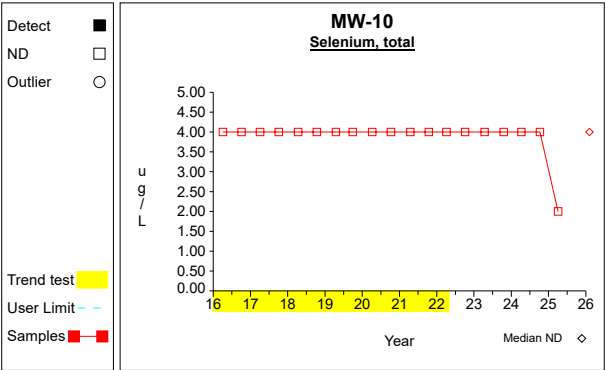


Graph 9

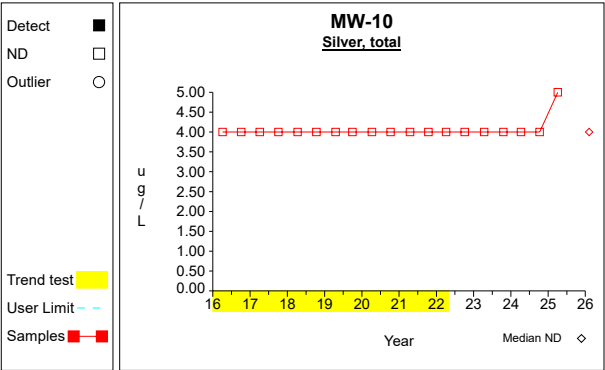
Time Series



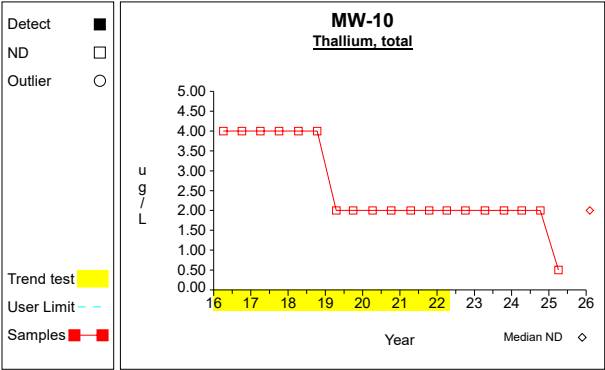
Graph 10



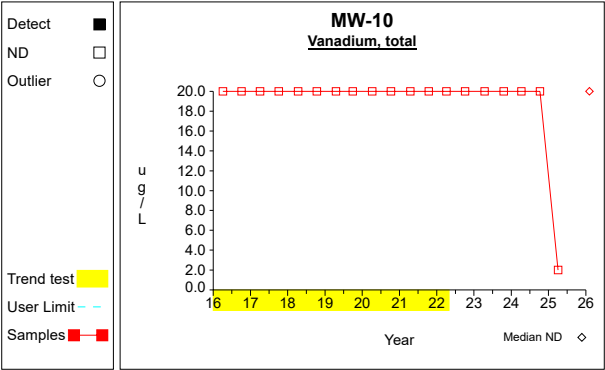
Graph 11



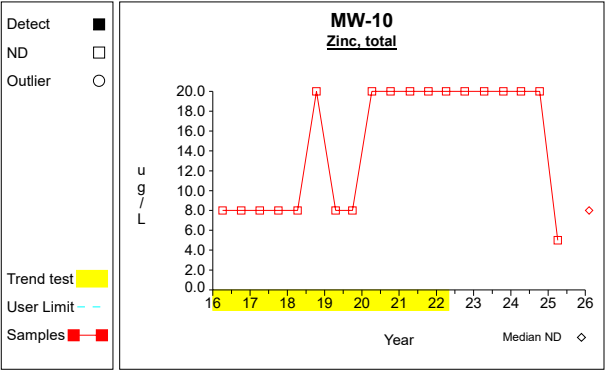
Graph 12



Graph 13

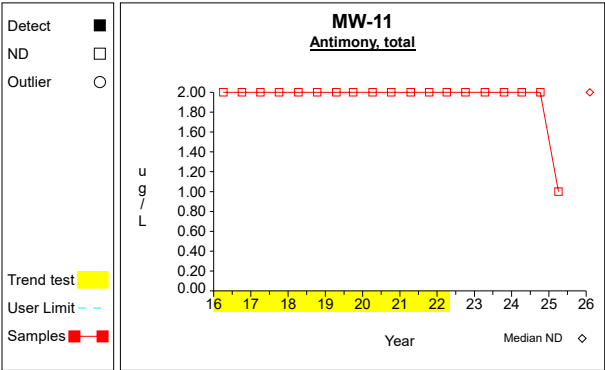


Graph 14

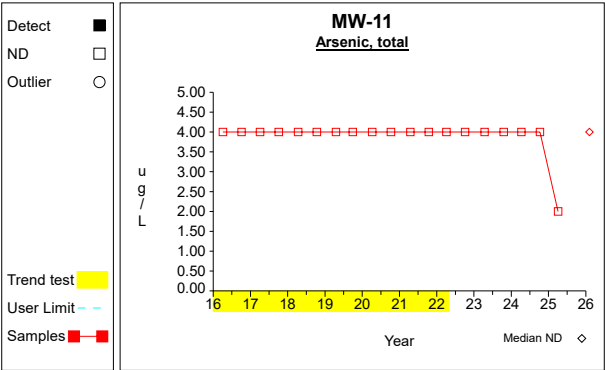


Graph 15

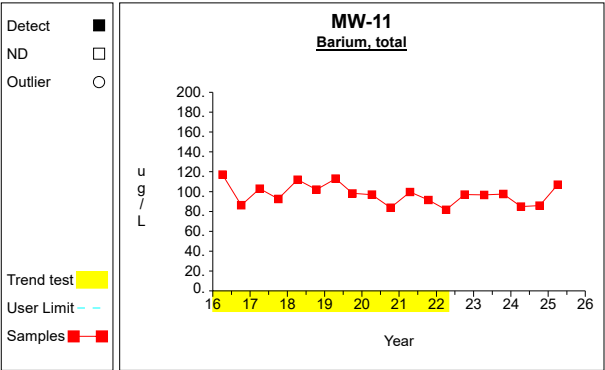
Time Series



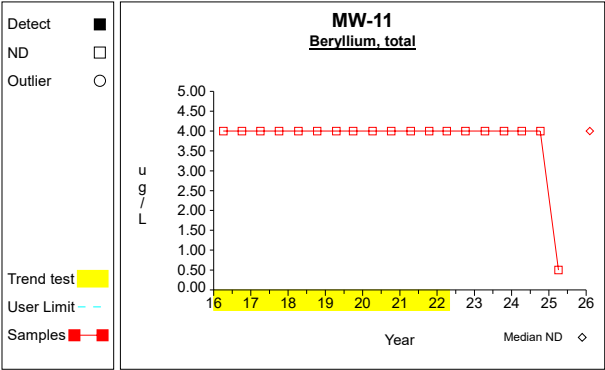
Graph 16



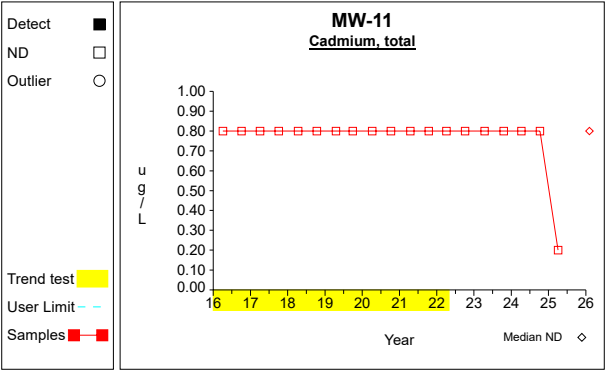
Graph 17



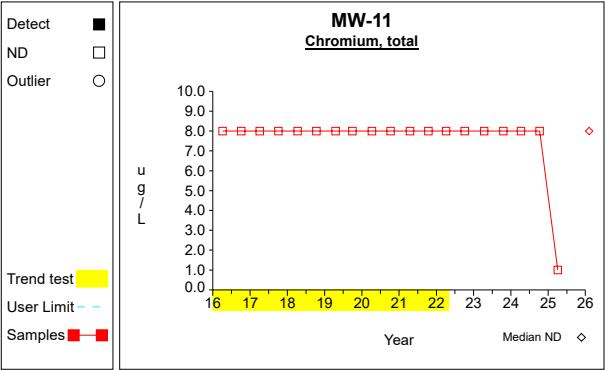
Graph 18



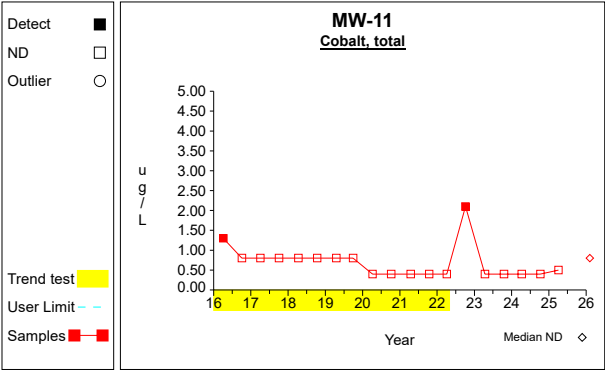
Graph 19



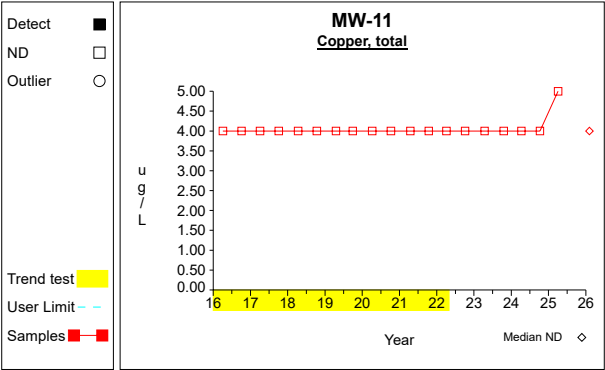
Graph 20



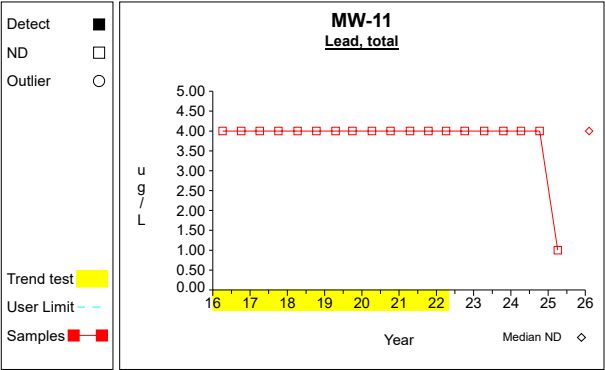
Graph 21



Graph 22

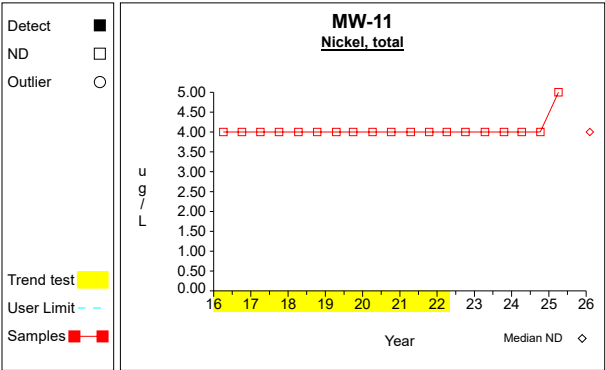


Graph 23

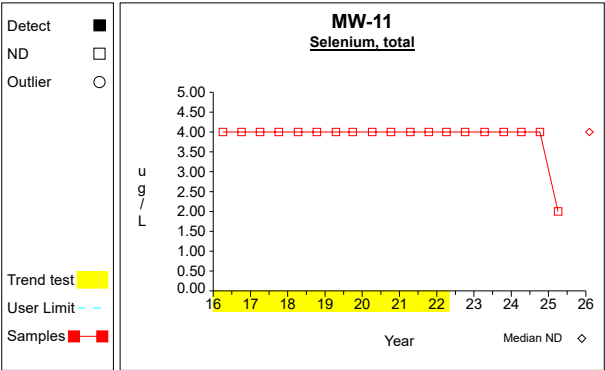


Graph 24

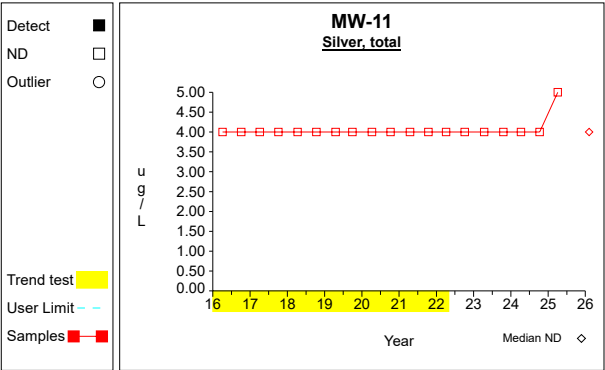
Time Series



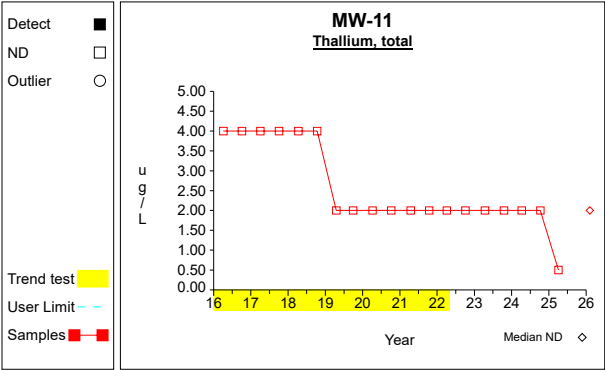
Graph 25



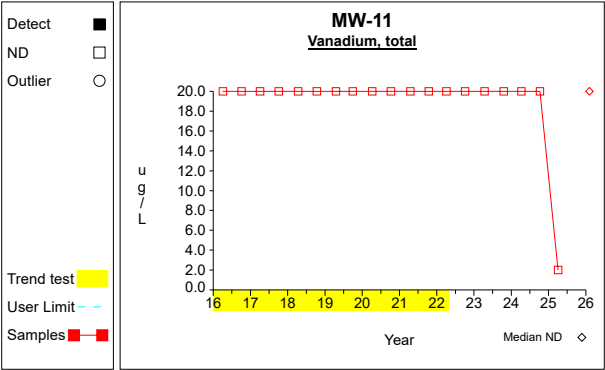
Graph 26



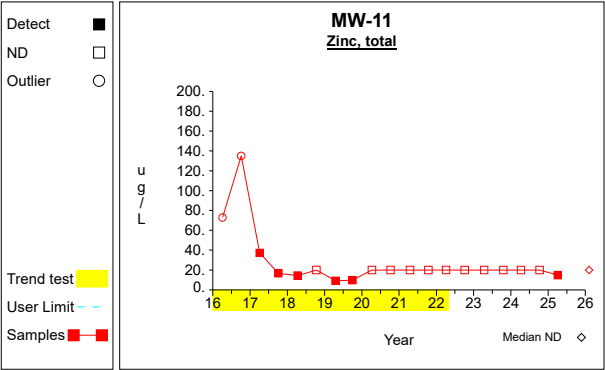
Graph 27



Graph 28

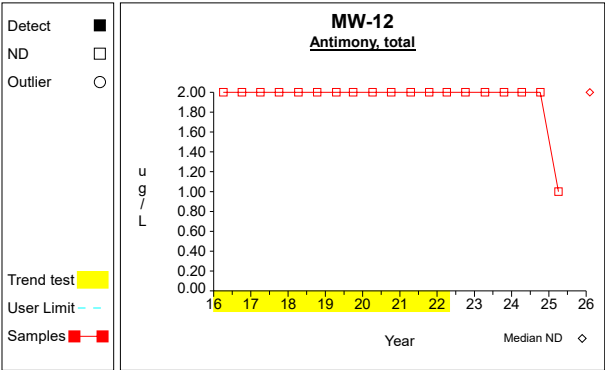


Graph 29

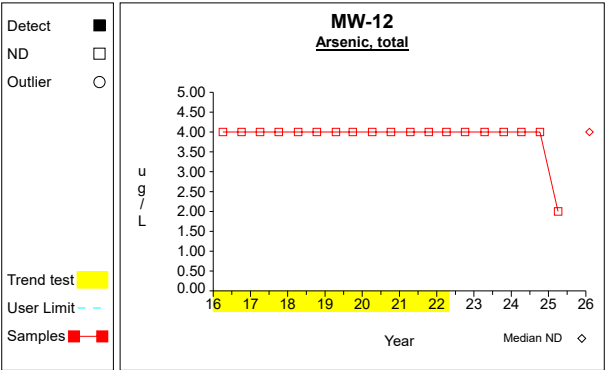


Graph 30

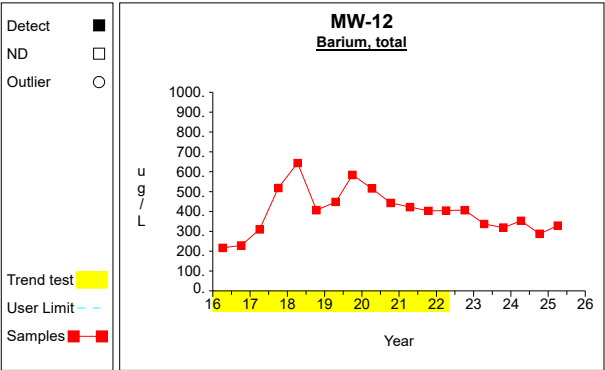
Time Series



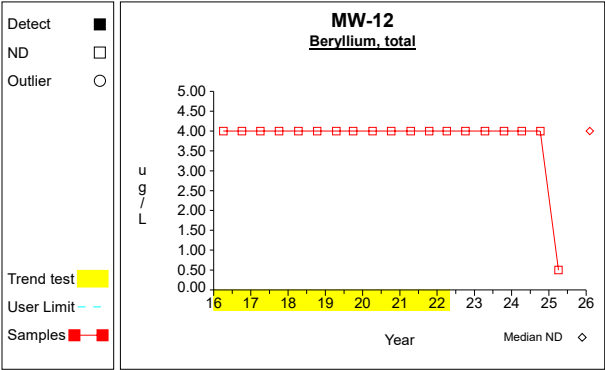
Graph 31



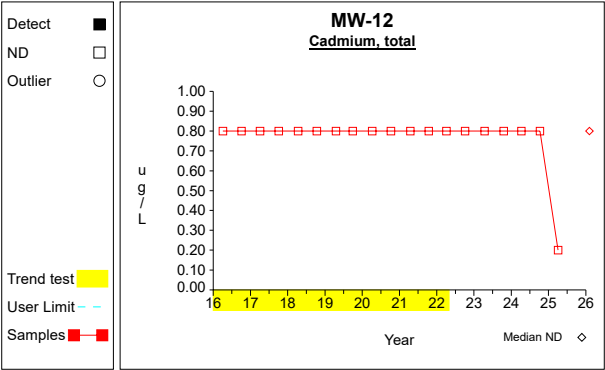
Graph 32



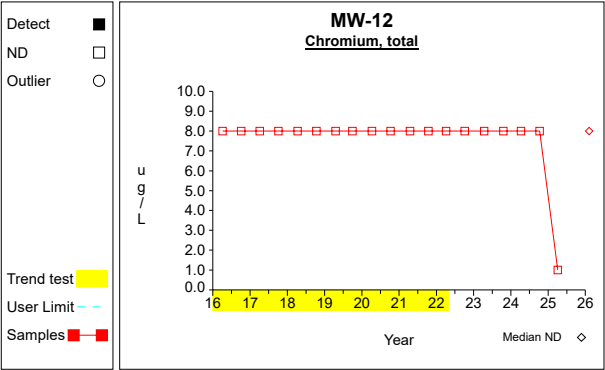
Graph 33



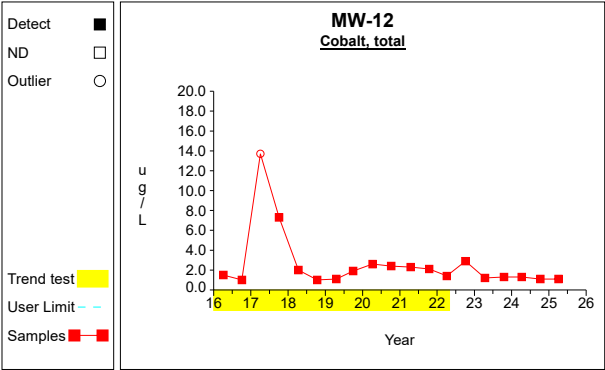
Graph 34



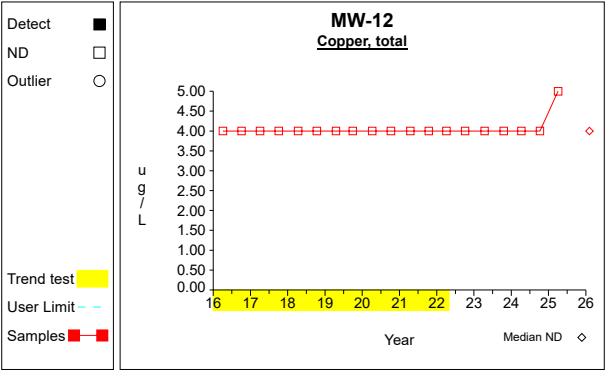
Graph 35



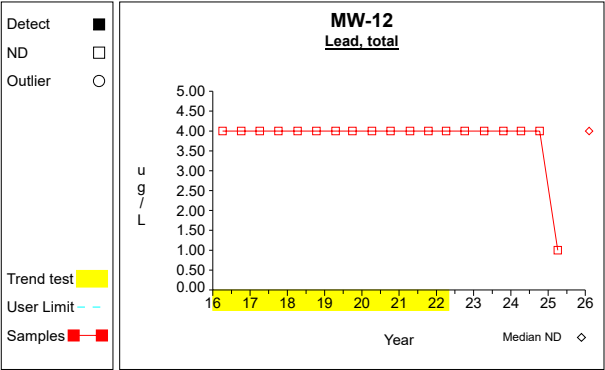
Graph 36



Graph 37

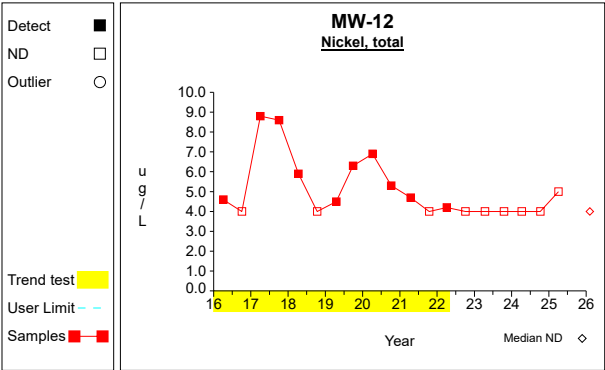


Graph 38

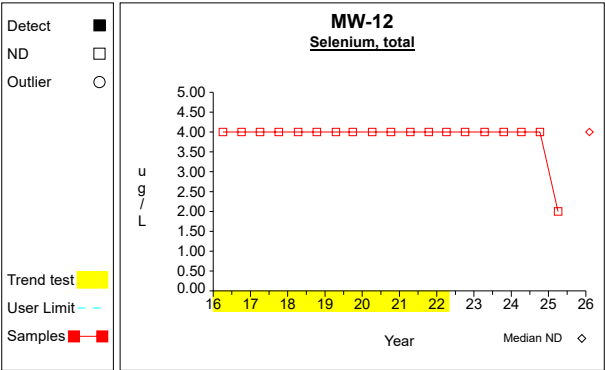


Graph 39

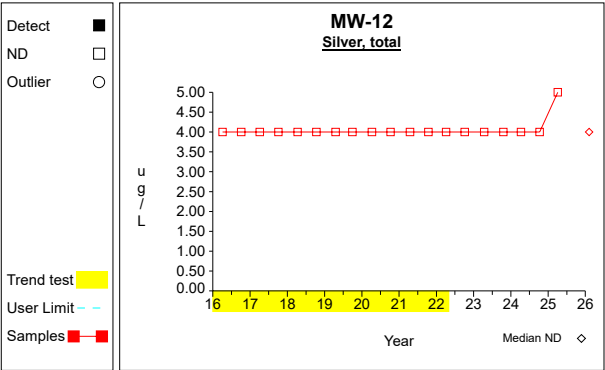
Time Series



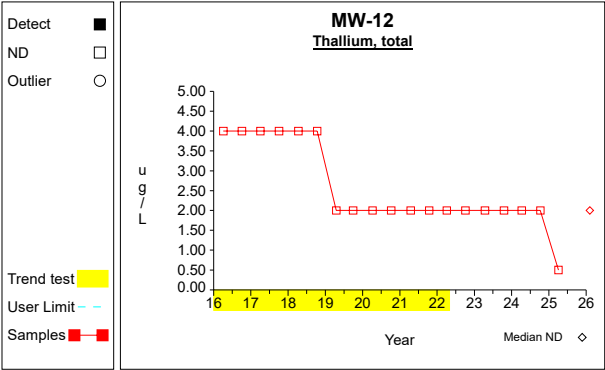
Graph 40



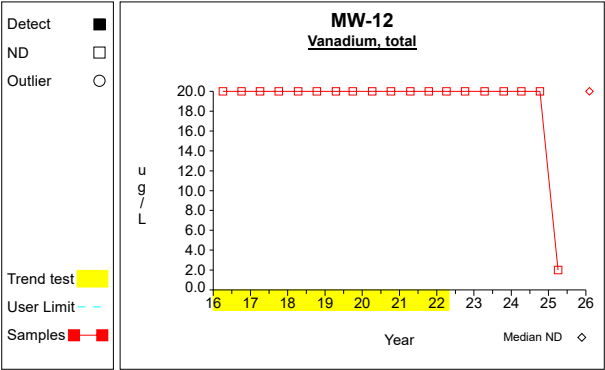
Graph 41



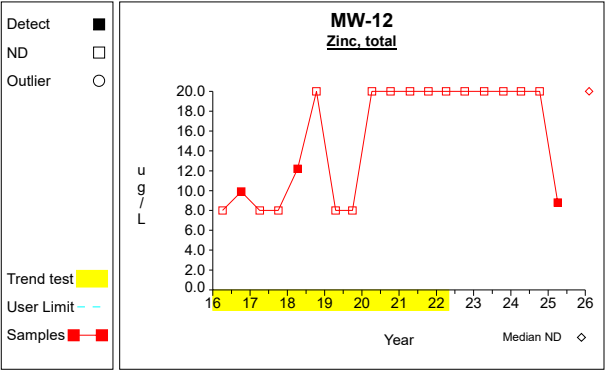
Graph 42



Graph 43

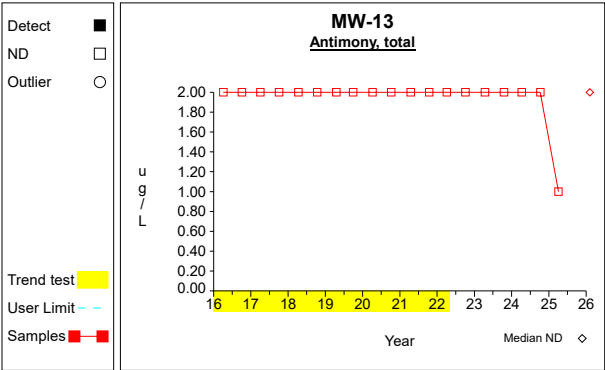


Graph 44

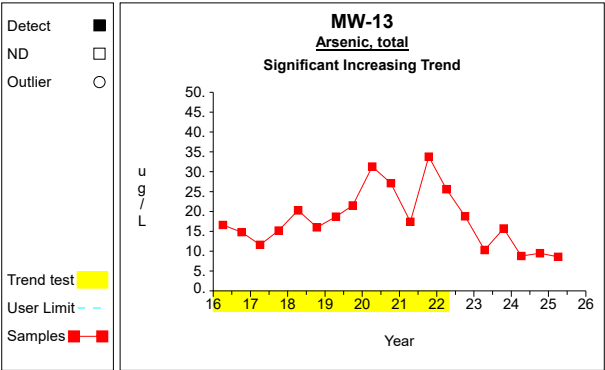


Graph 45

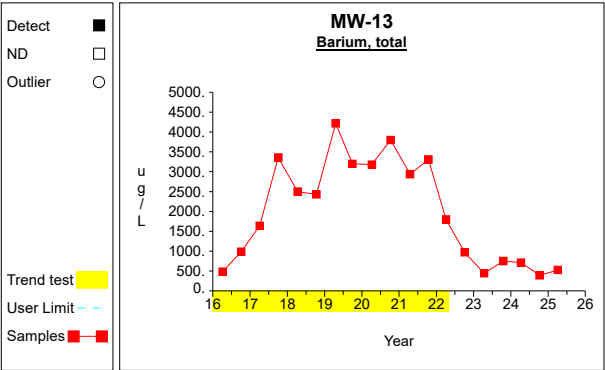
Time Series



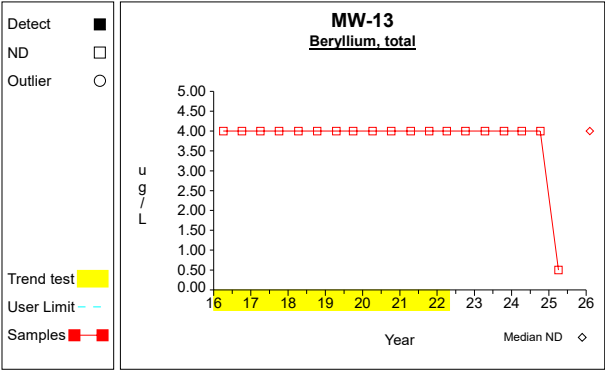
Graph 46



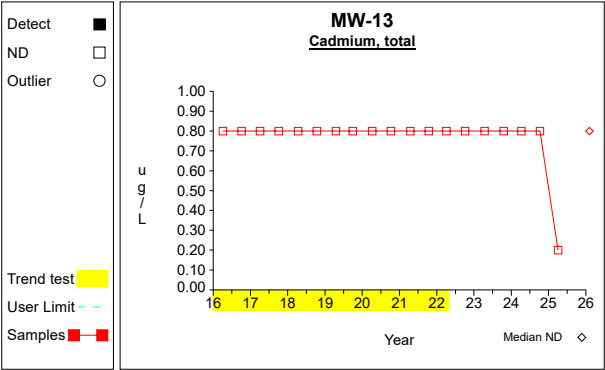
Graph 47



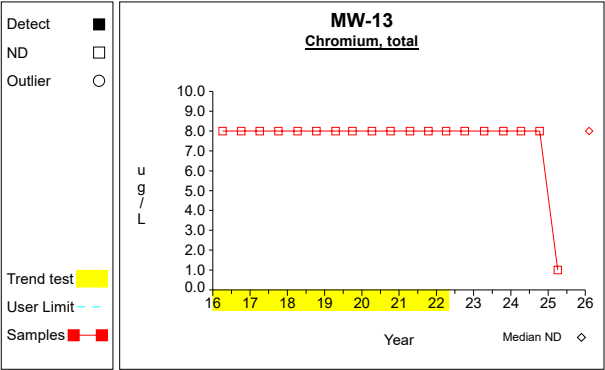
Graph 48



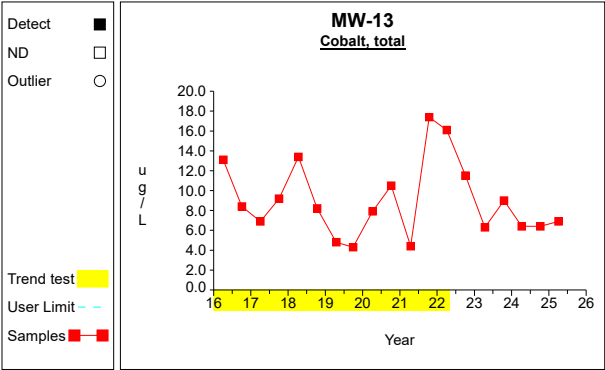
Graph 49



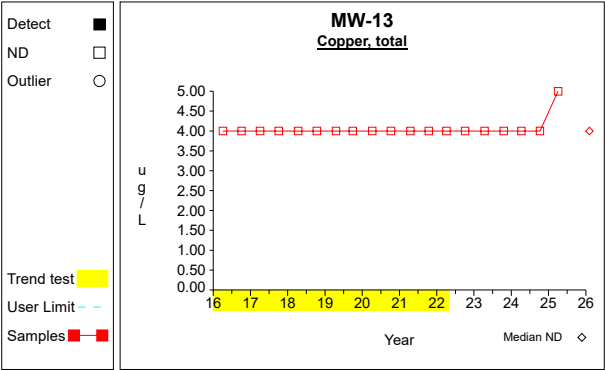
Graph 50



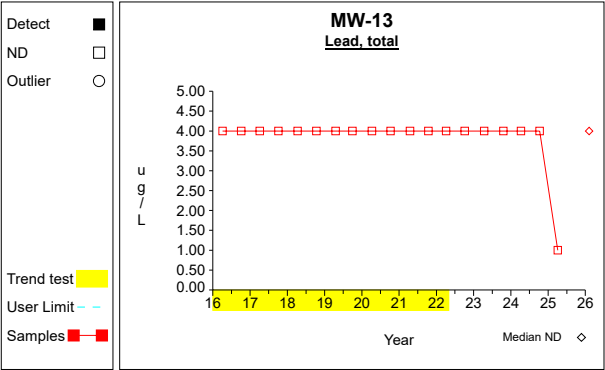
Graph 51



Graph 52

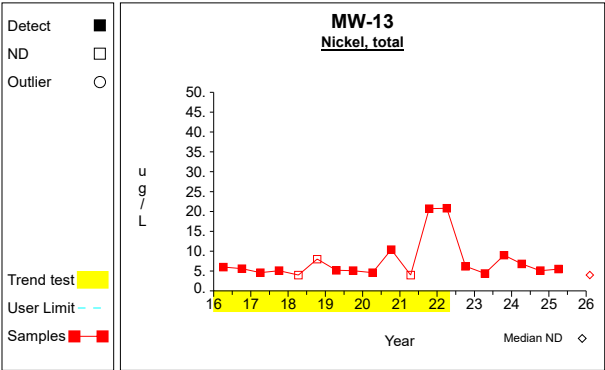


Graph 53

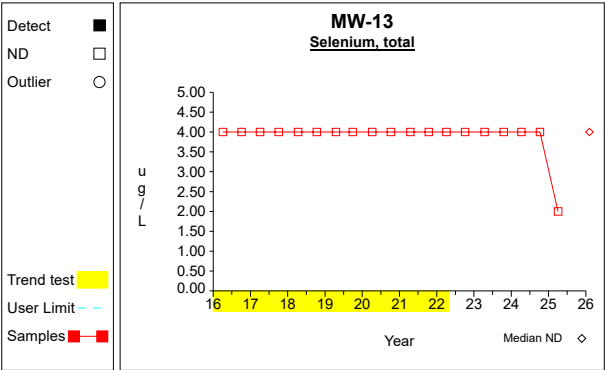


Graph 54

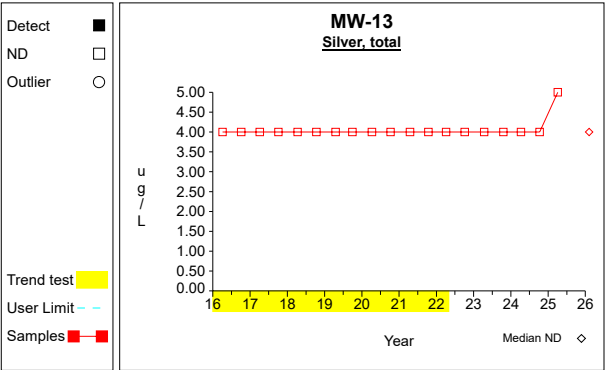
Time Series



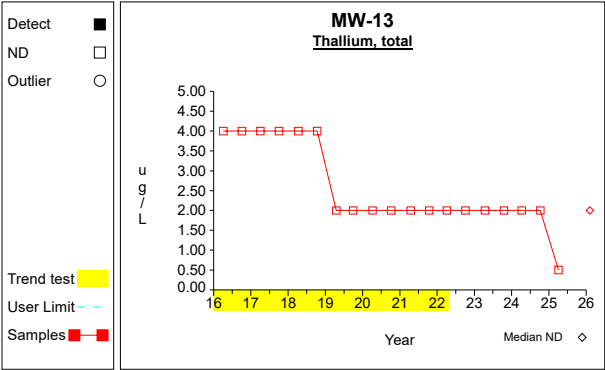
Graph 55



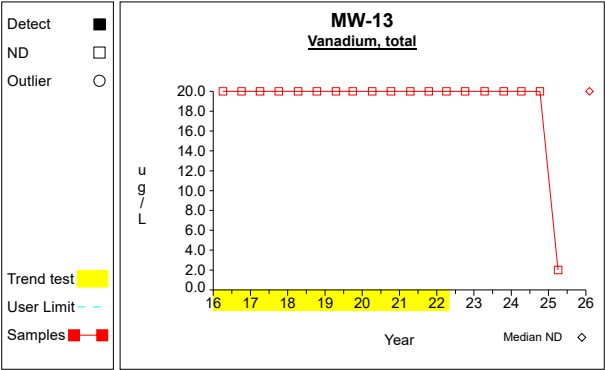
Graph 56



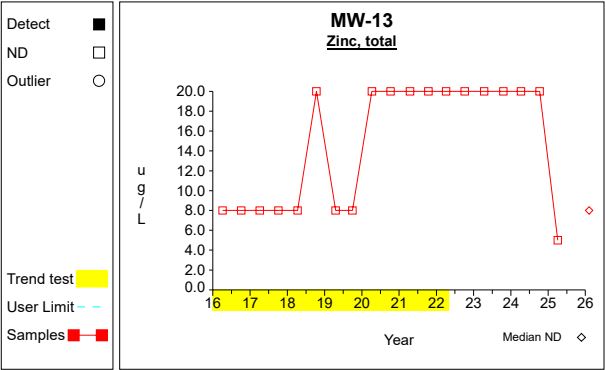
Graph 57



Graph 58

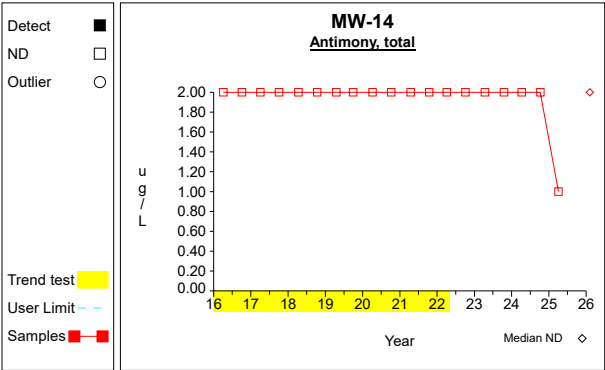


Graph 59

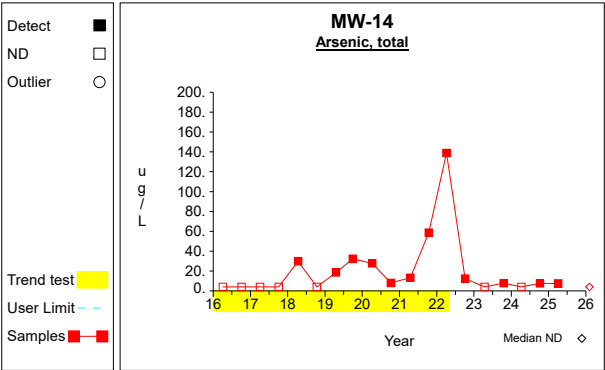


Graph 60

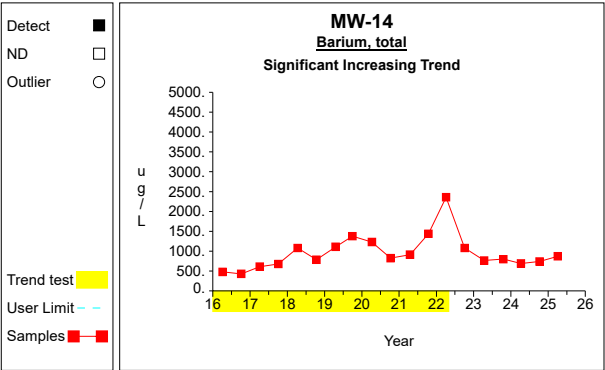
Time Series



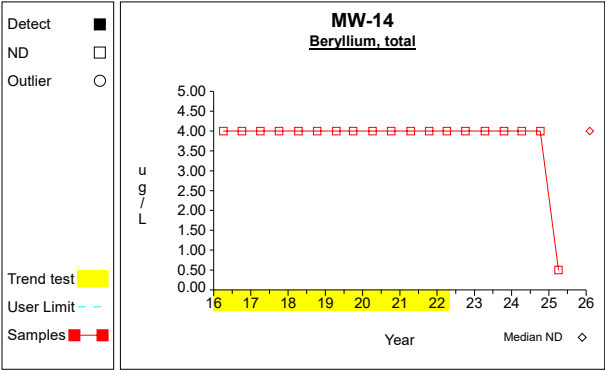
Graph 61



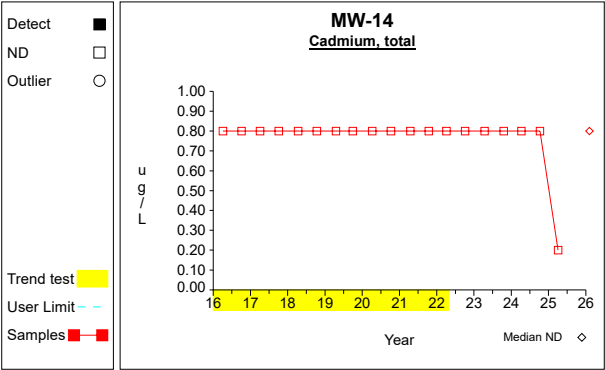
Graph 62



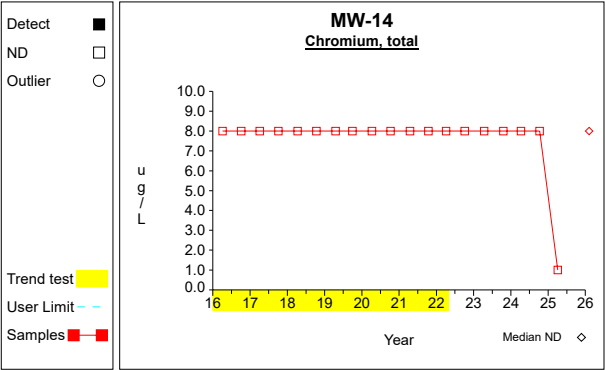
Graph 63



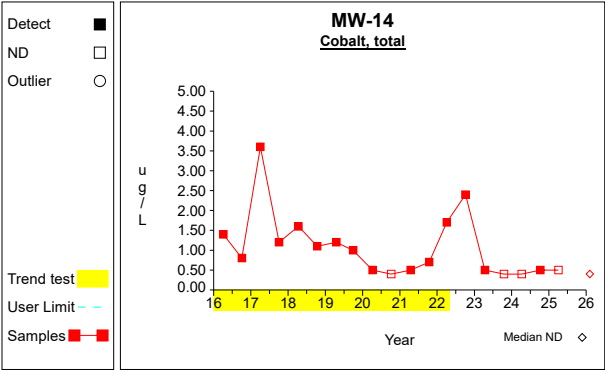
Graph 64



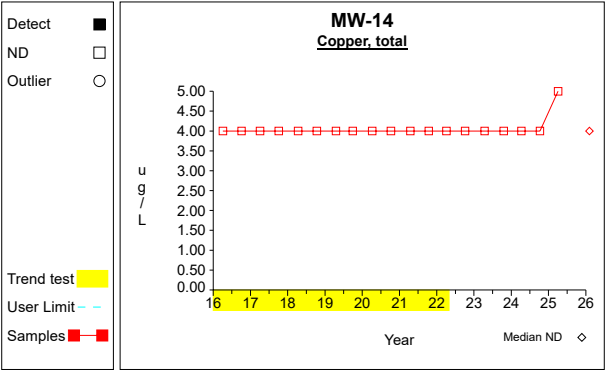
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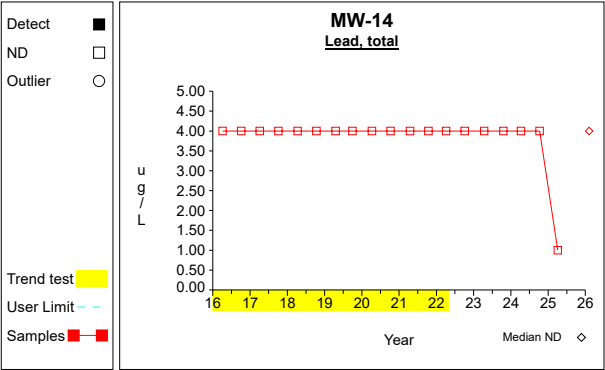
Graph 66



Graph 67

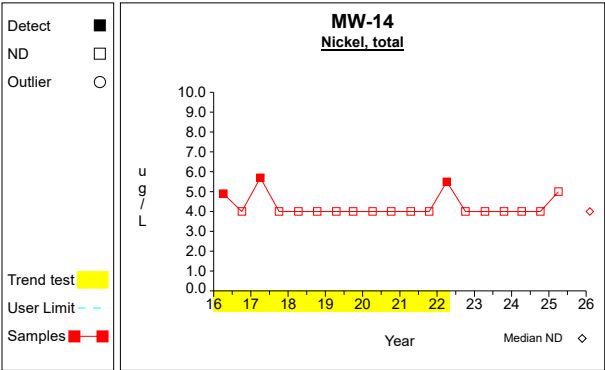


Graph 68

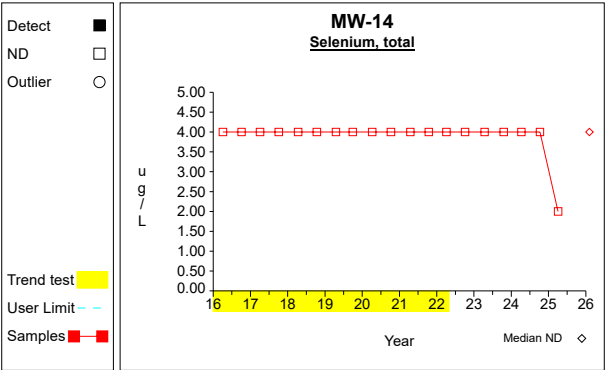


Graph 69

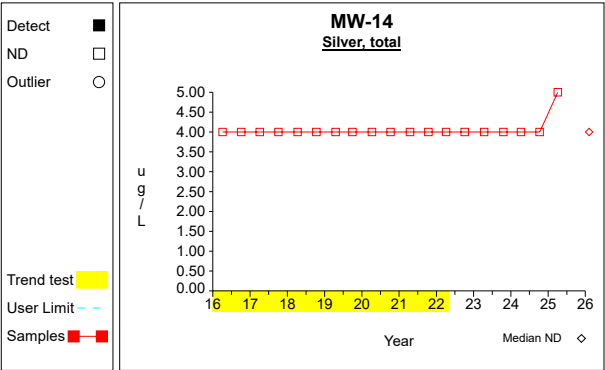
Time Series



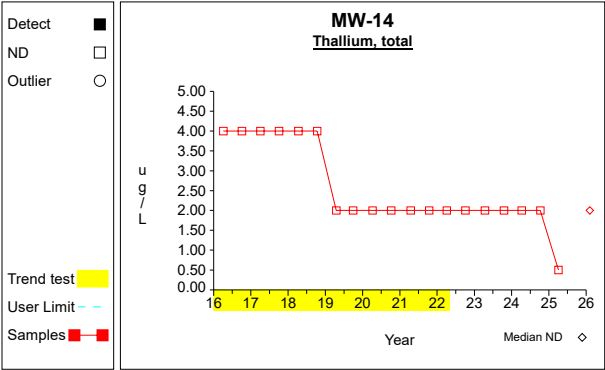
Graph 70



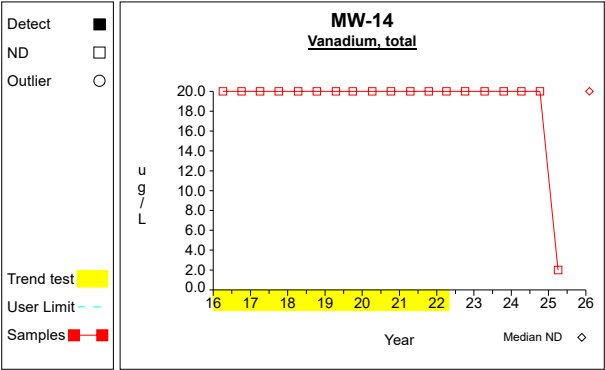
Graph 71



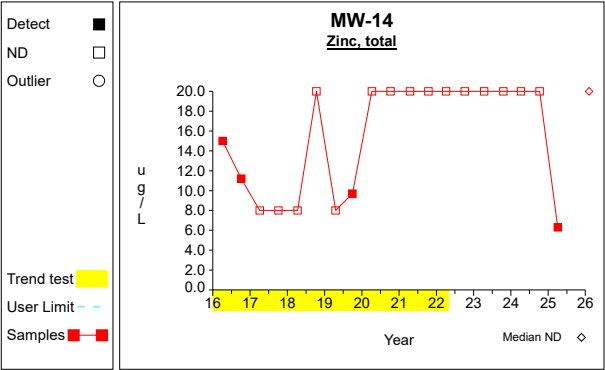
Graph 72



Graph 73

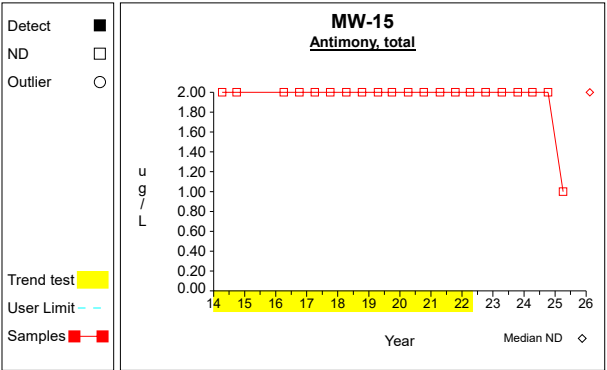


Graph 74

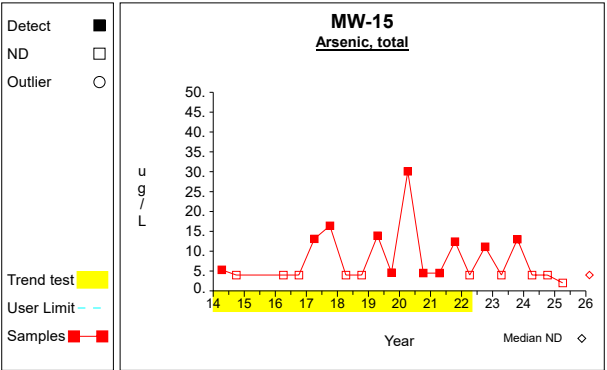


Graph 75

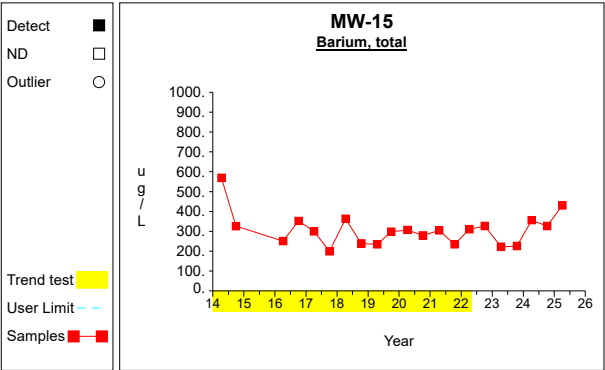
Time Series



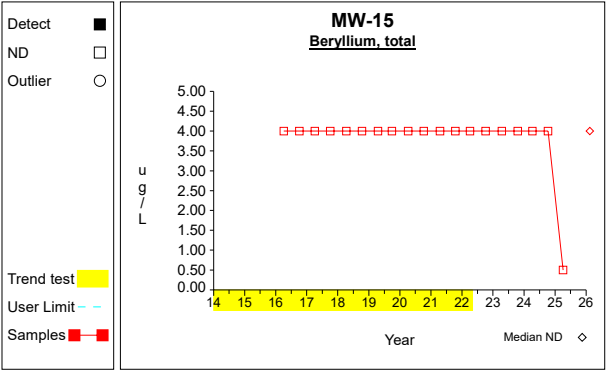
Graph 76



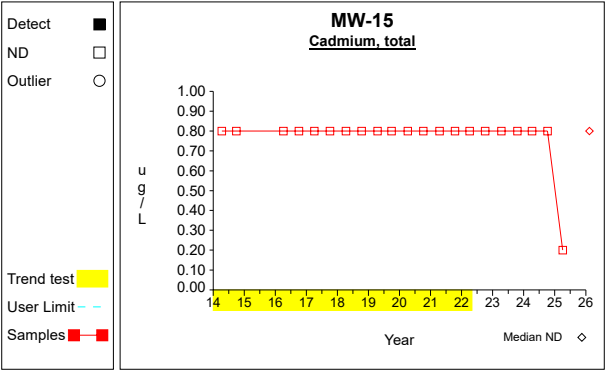
Graph 77



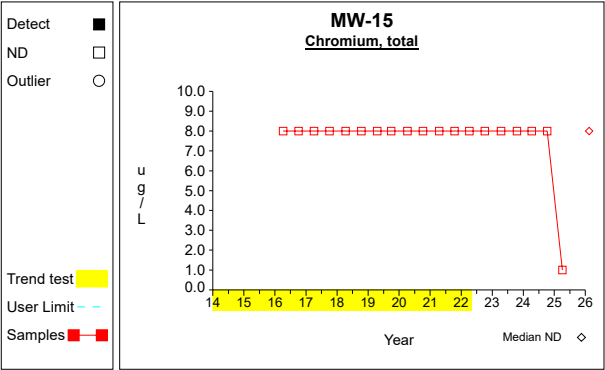
Graph 78



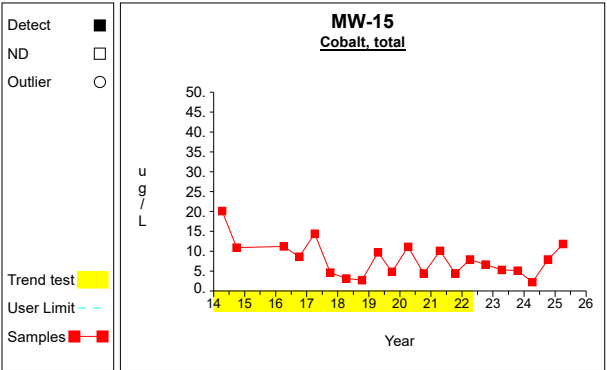
Graph 79



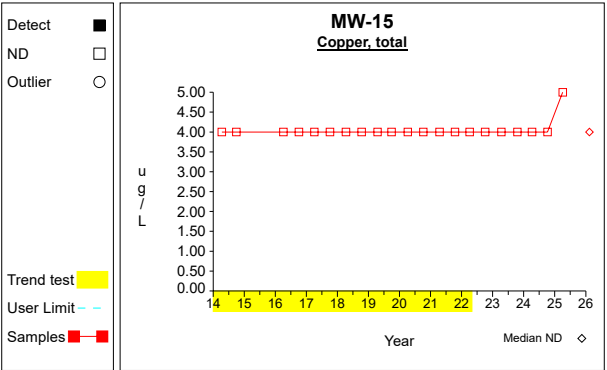
Graph 80



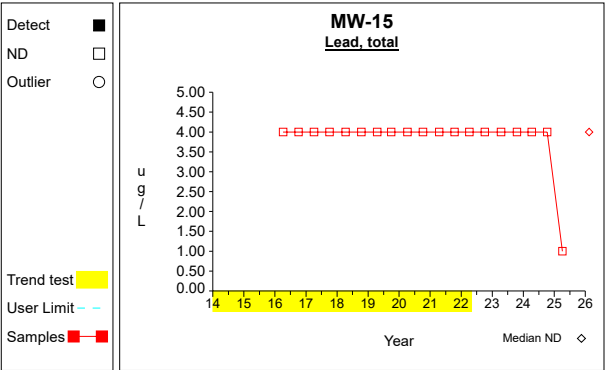
Graph 81



Graph 82

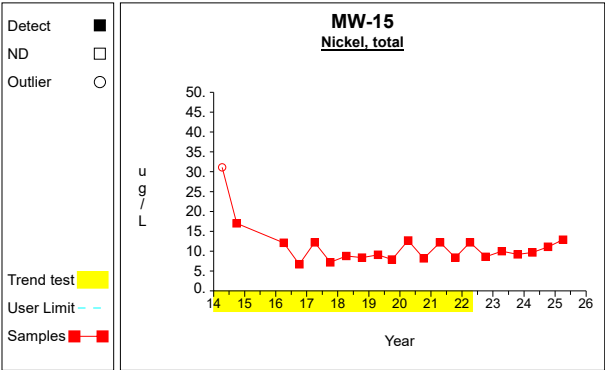


Graph 83

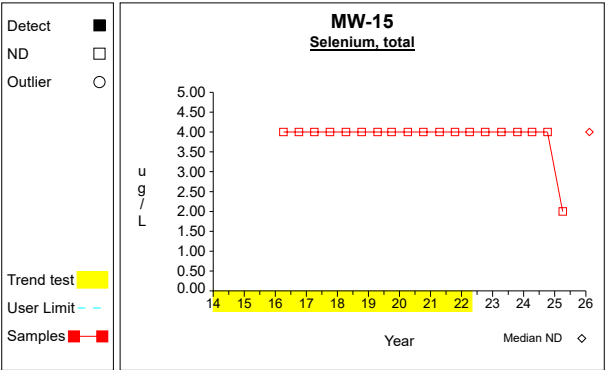


Graph 84

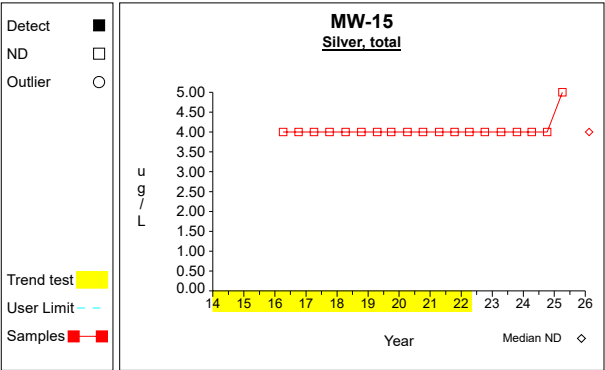
Time Series



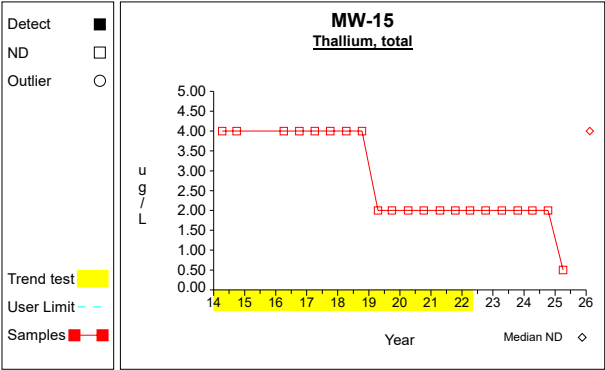
Graph 85



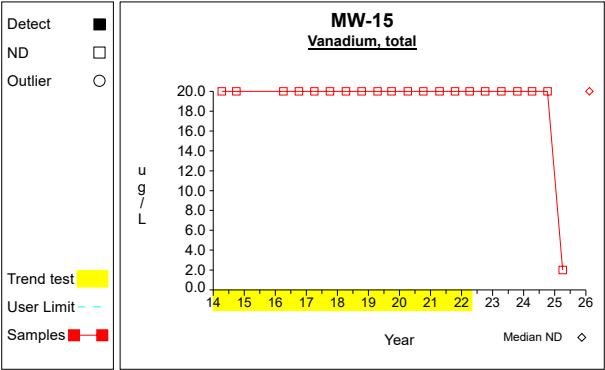
Graph 86



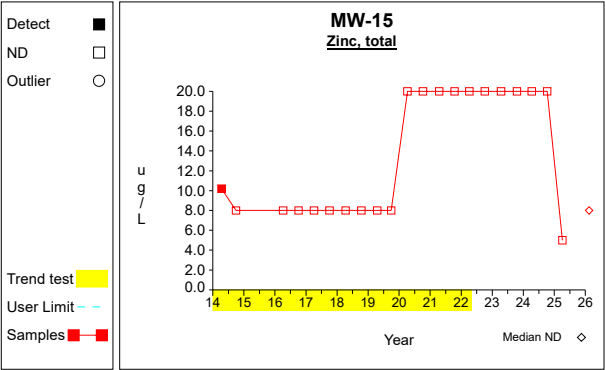
Graph 87



Graph 88

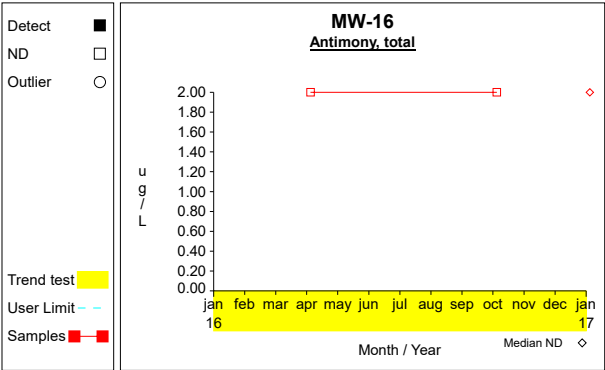


Graph 89

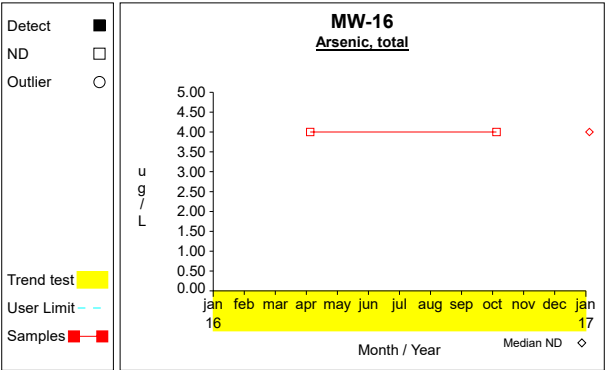


Graph 90

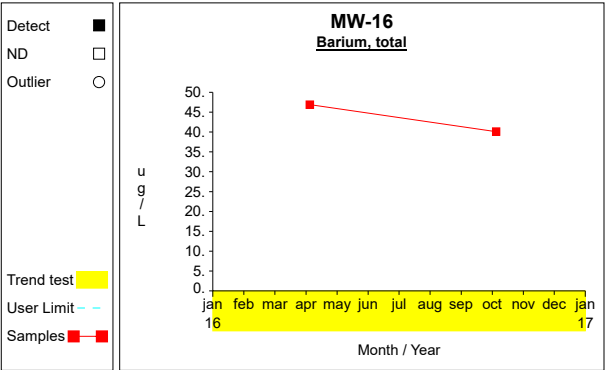
Time Series



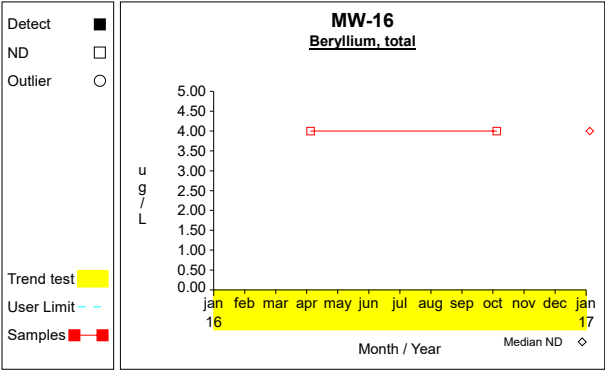
Graph 91



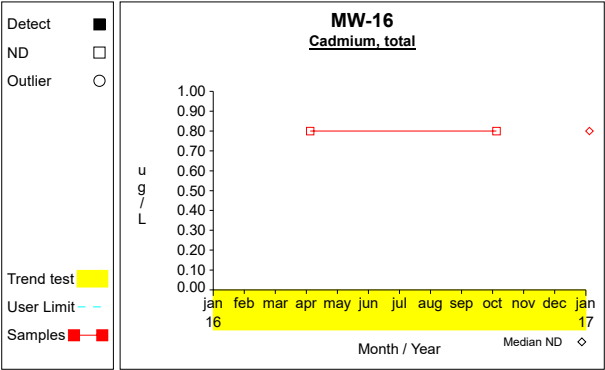
Graph 92



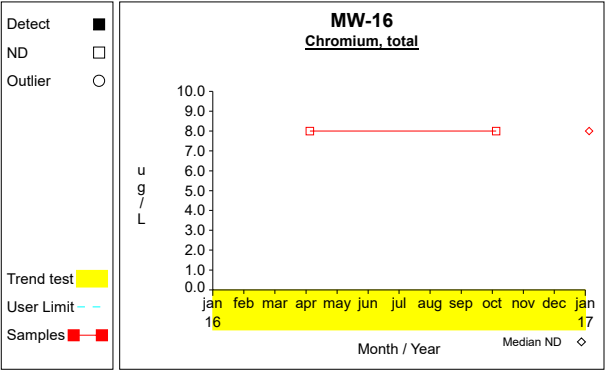
Graph 93



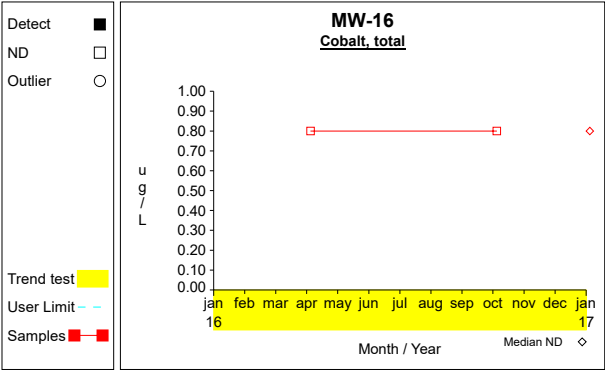
Graph 94



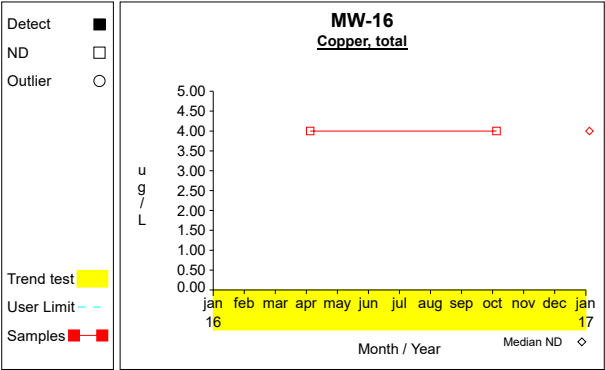
Graph 95



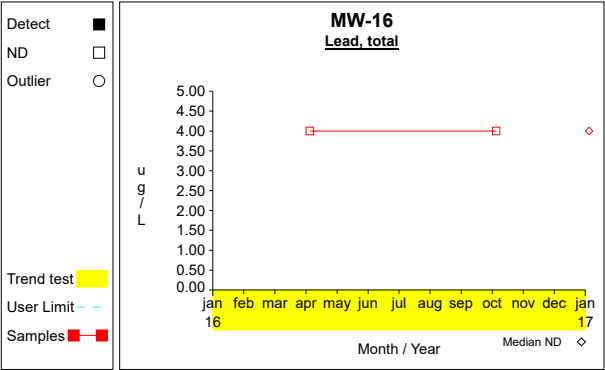
Graph 96



Graph 97

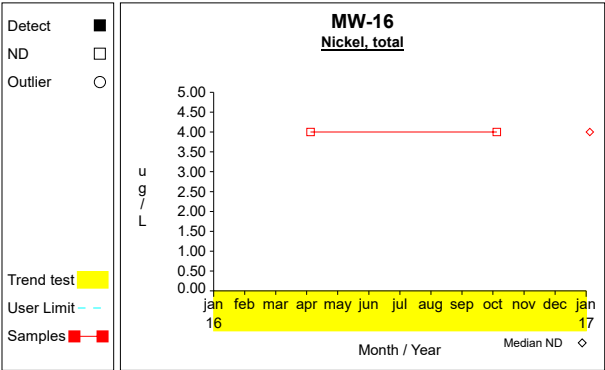


Graph 98

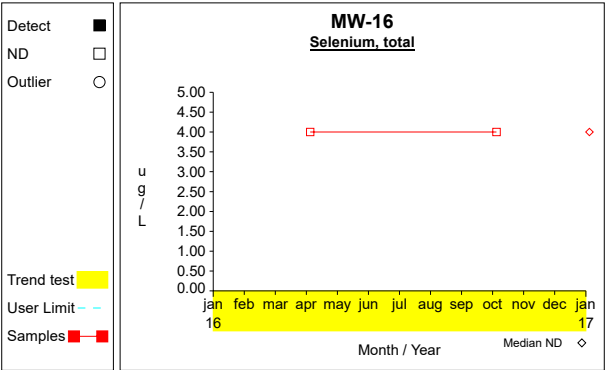


Graph 99

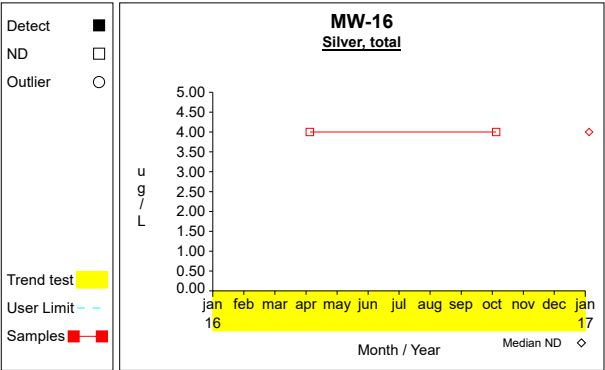
Time Series



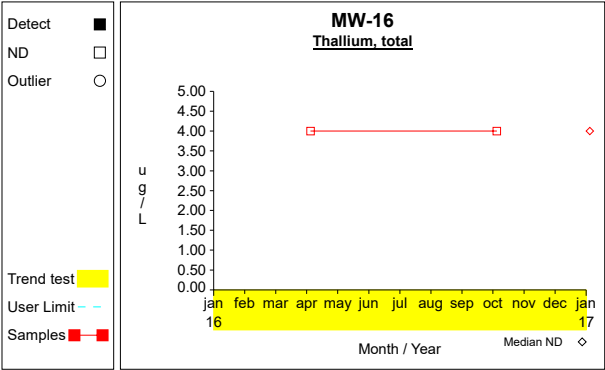
Graph 100



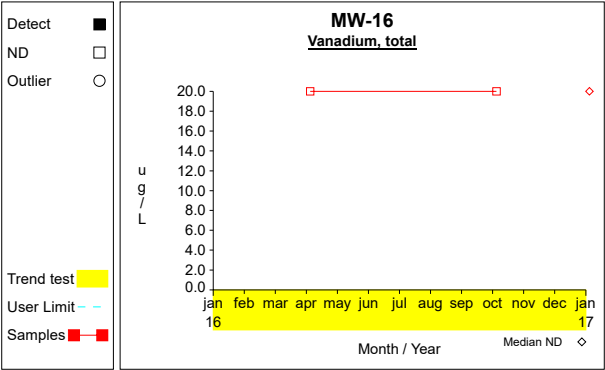
Graph 101



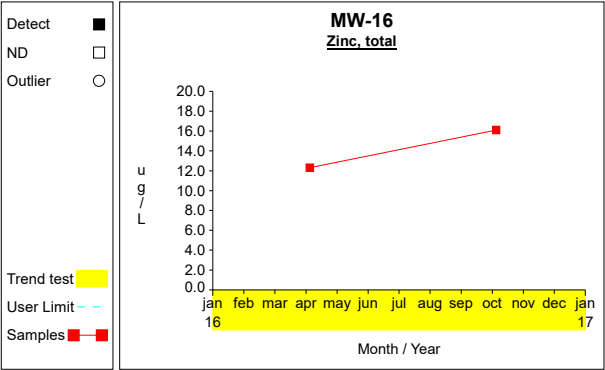
Graph 102



Graph 103

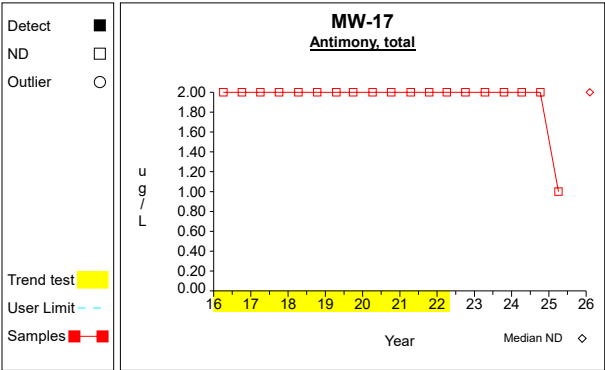


Graph 104

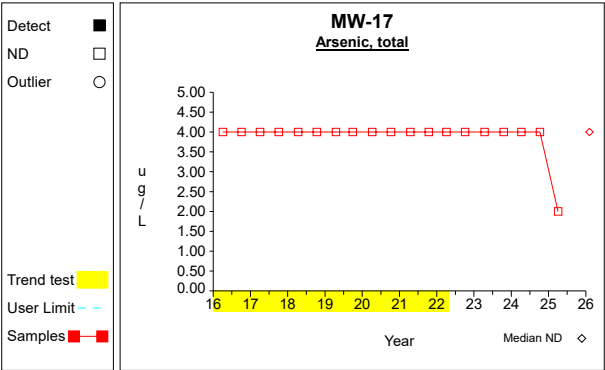


Graph 105

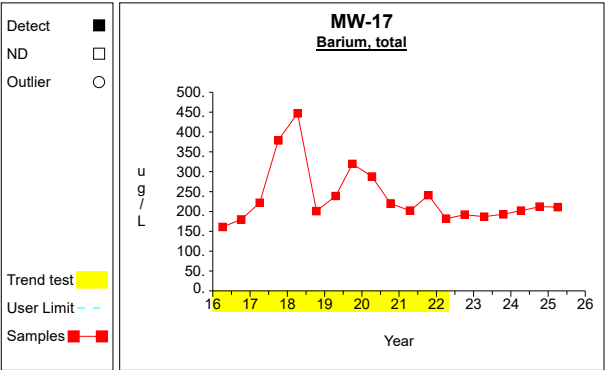
Time Series



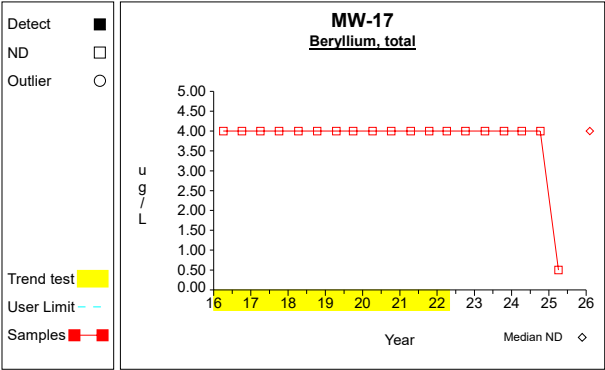
Graph 106



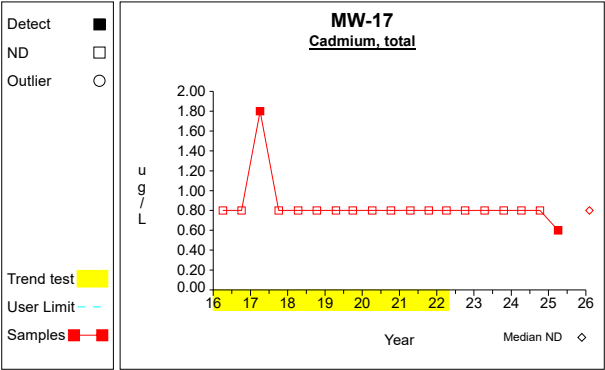
Graph 107



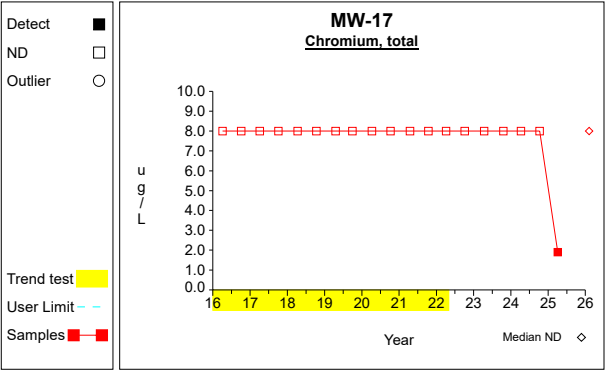
Graph 108



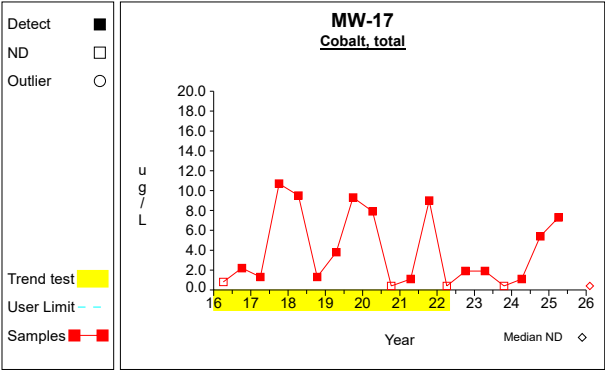
Graph 109



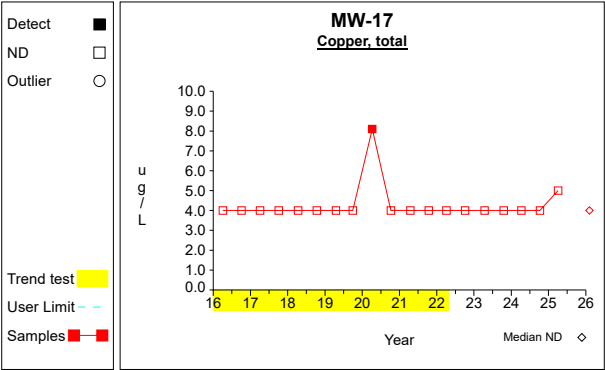
Graph 110



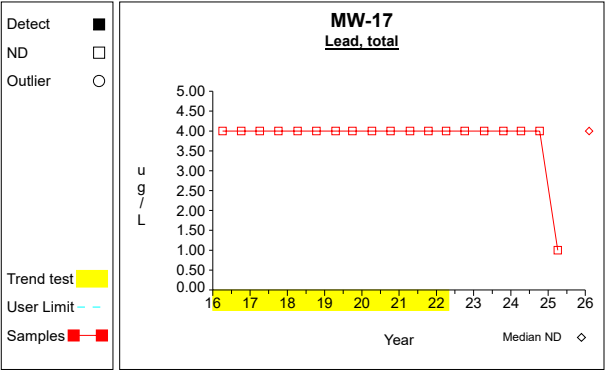
Graph 111



Graph 112

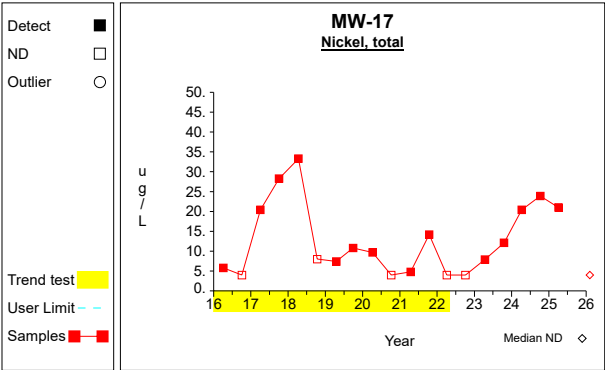


Graph 113

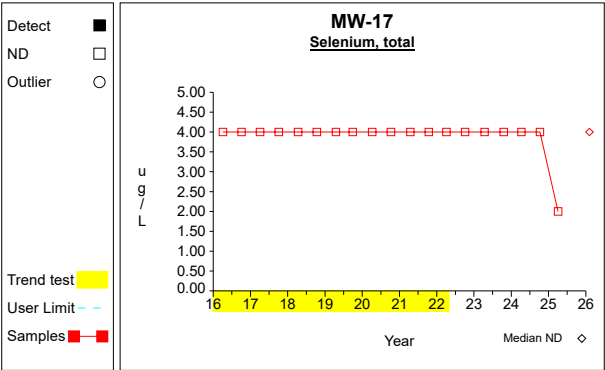


Graph 114

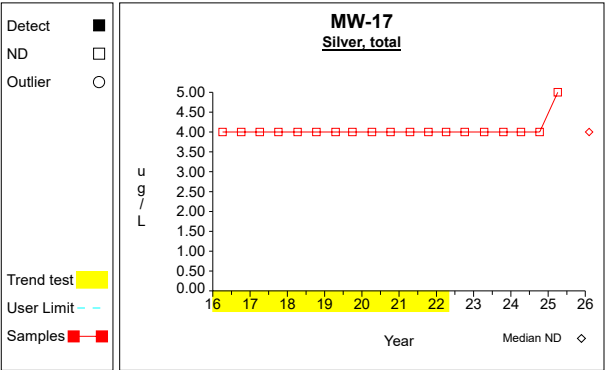
Time Series



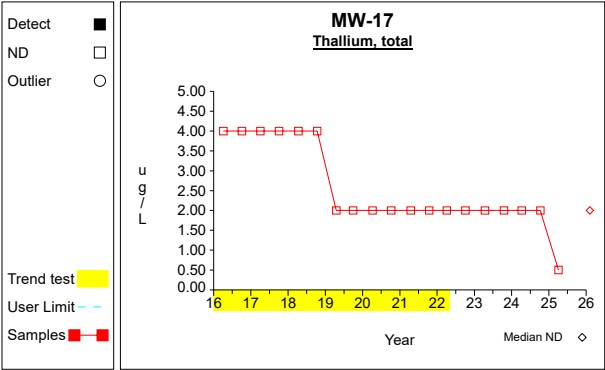
Graph 115



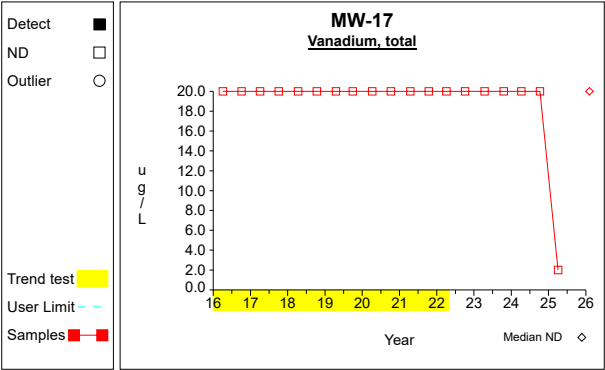
Graph 116



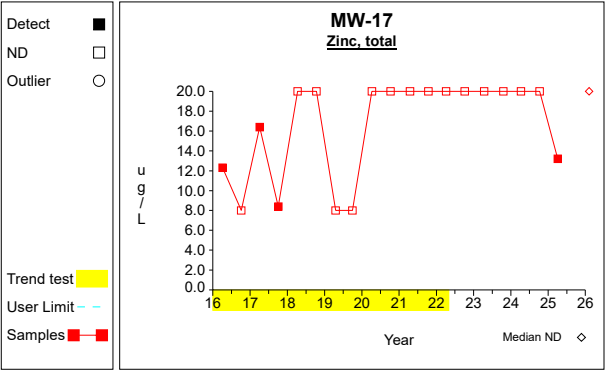
Graph 117



Graph 118

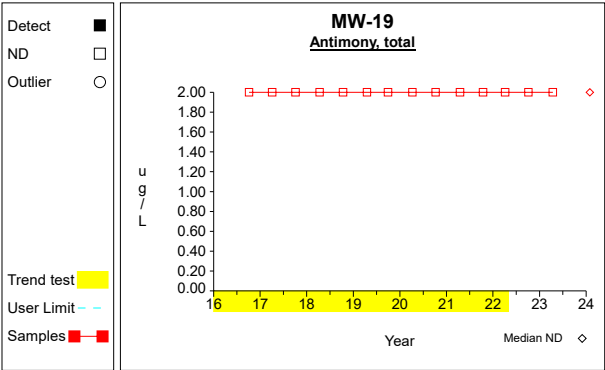


Graph 119

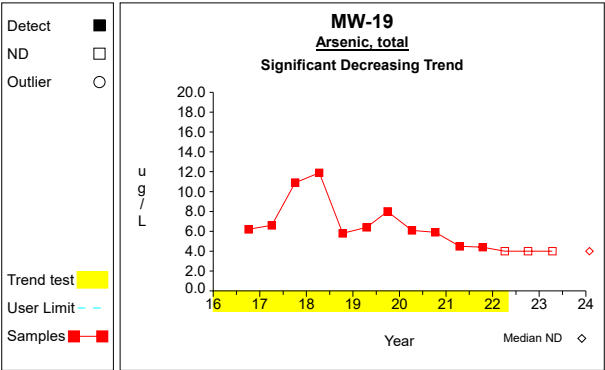


Graph 120

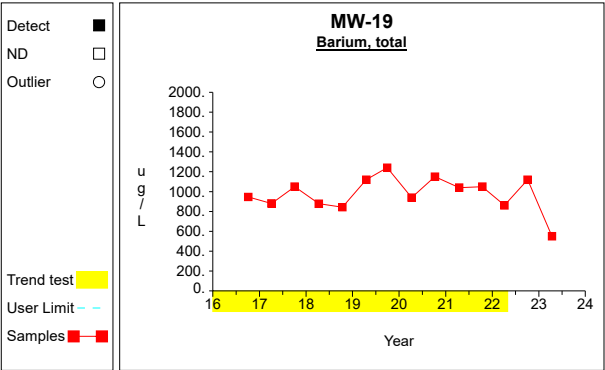
Time Series



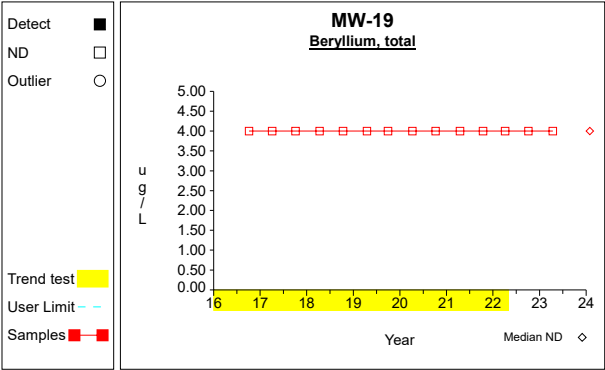
Graph 121



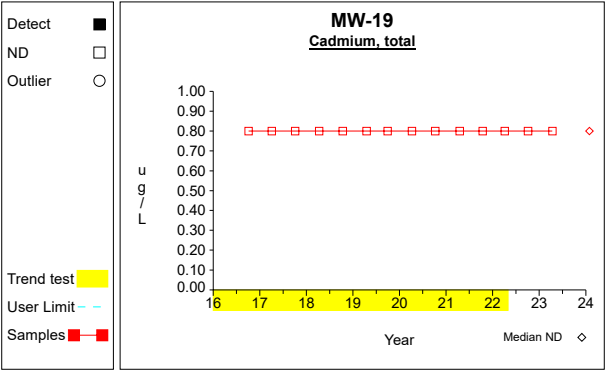
Graph 122



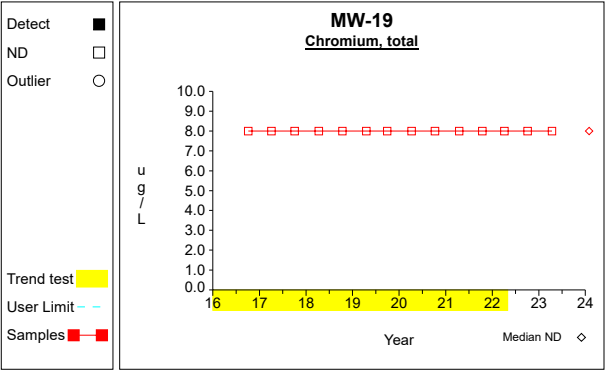
Graph 123



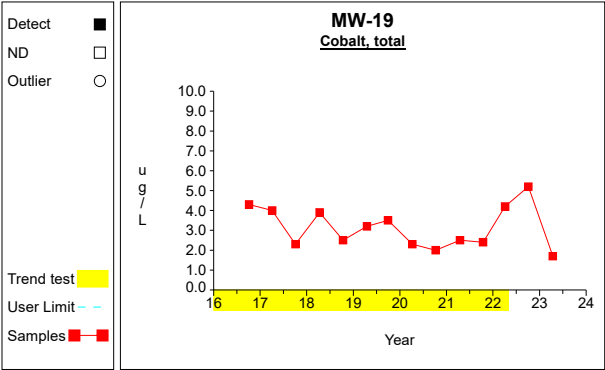
Graph 124



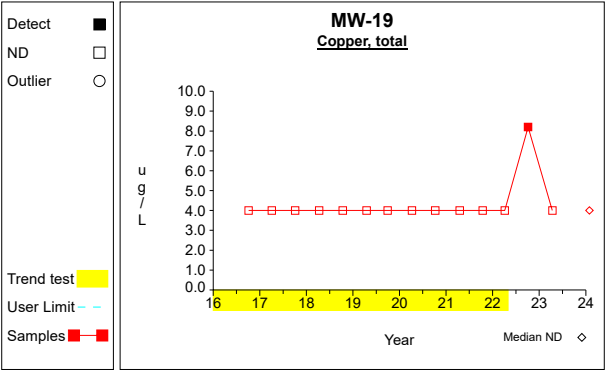
Graph 125



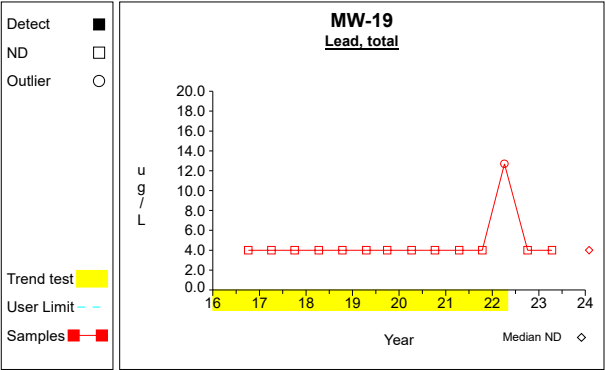
Graph 126



Graph 127

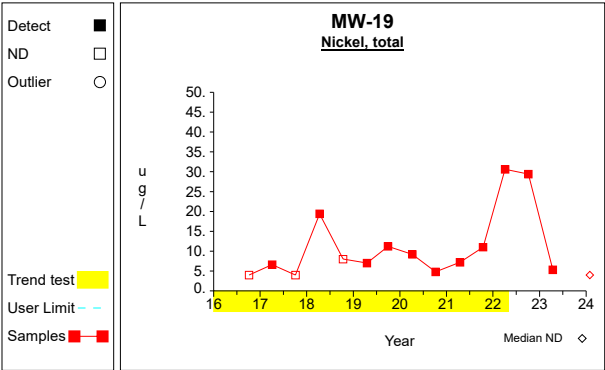


Graph 128

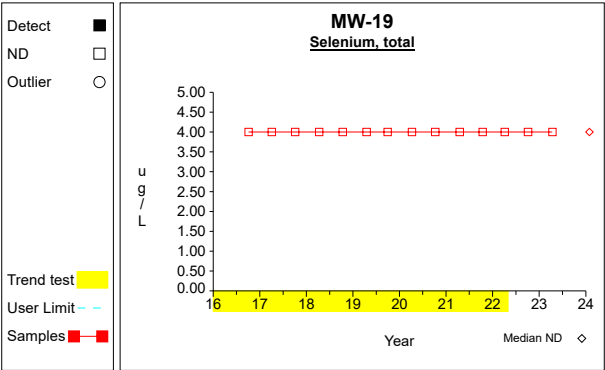


Graph 129

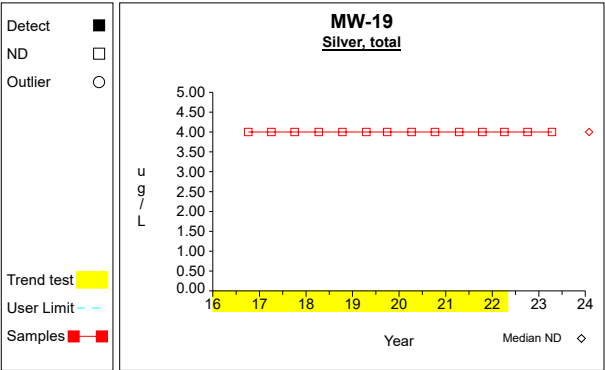
Time Series



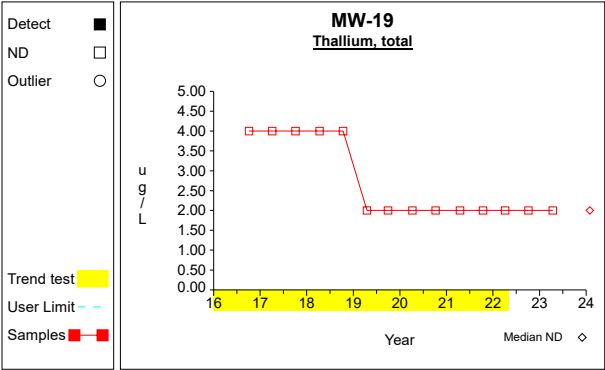
Graph 130



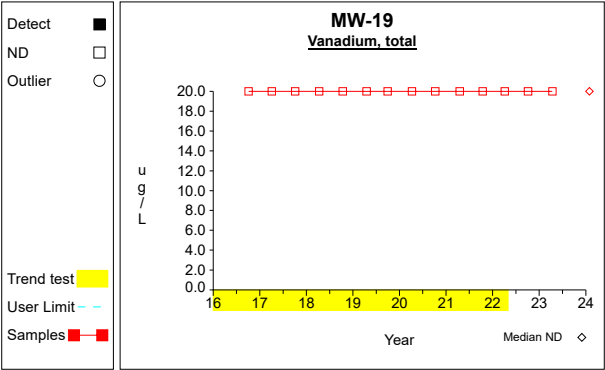
Graph 131



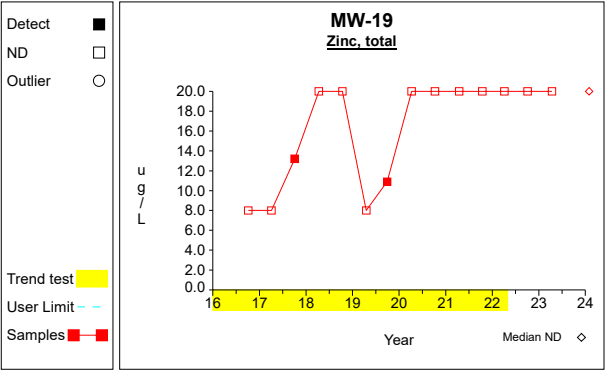
Graph 132



Graph 133

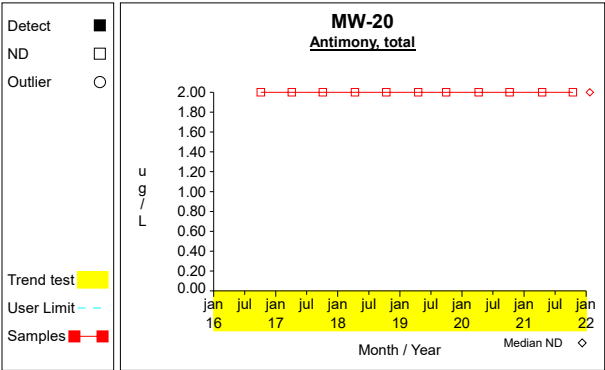


Graph 134

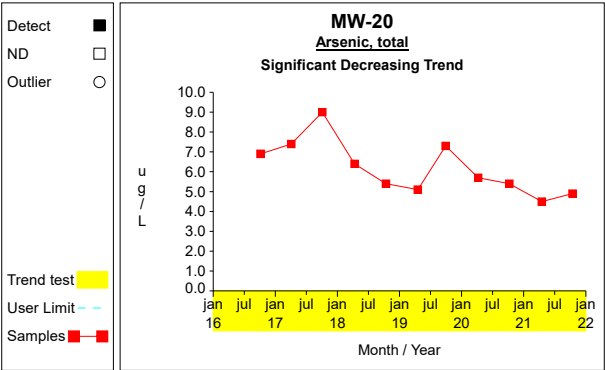


Graph 135

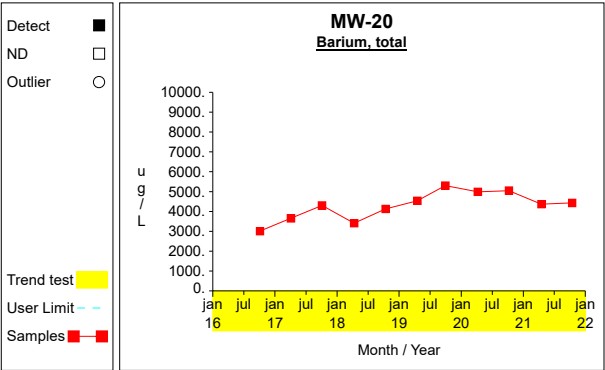
Time Series



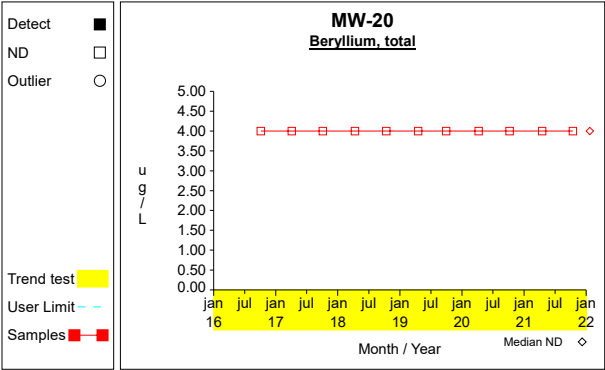
Graph 136



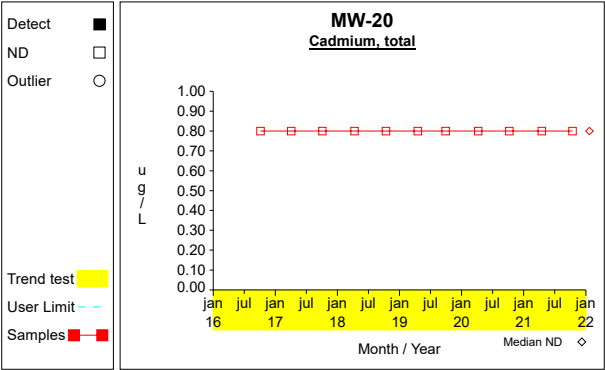
Graph 137



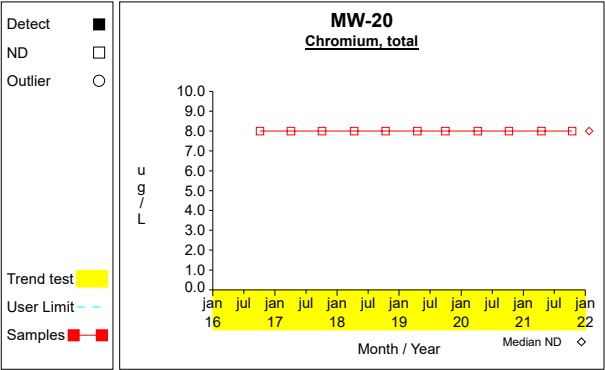
Graph 138



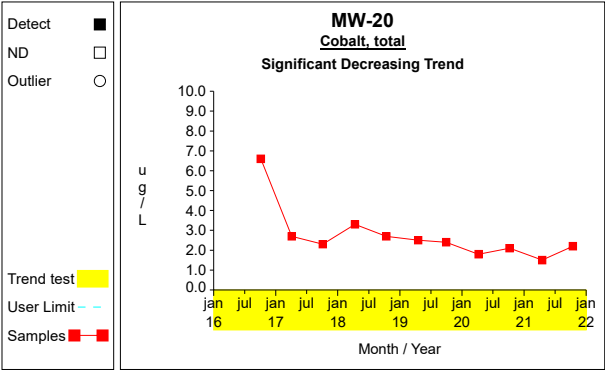
Graph 139



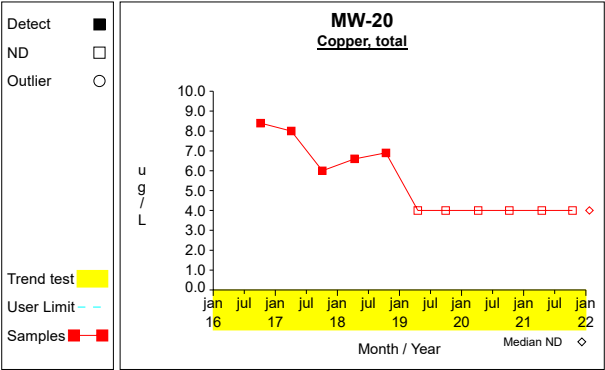
Graph 140



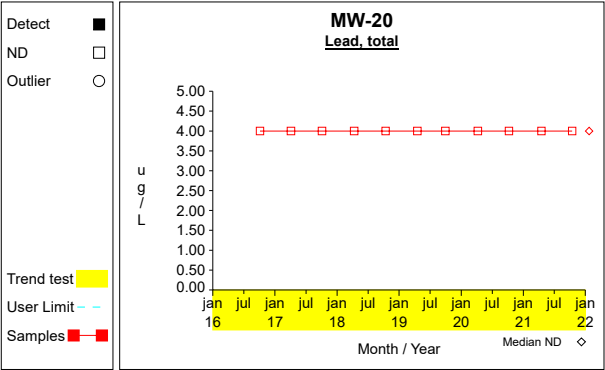
Graph 141



Graph 142

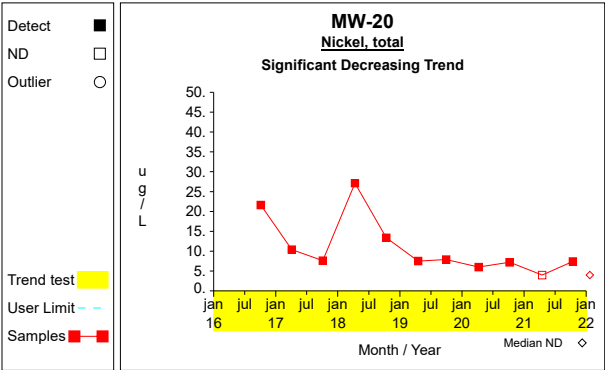


Graph 143

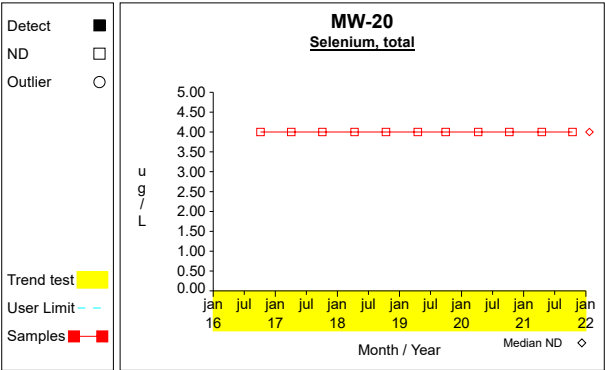


Graph 144

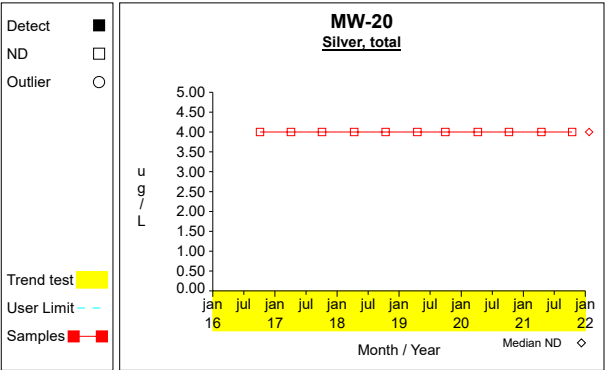
Time Series



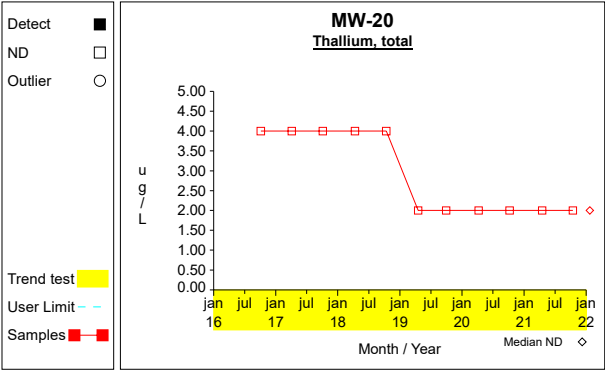
Graph 145



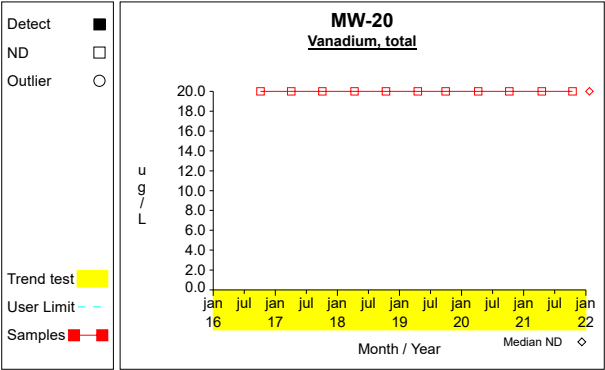
Graph 146



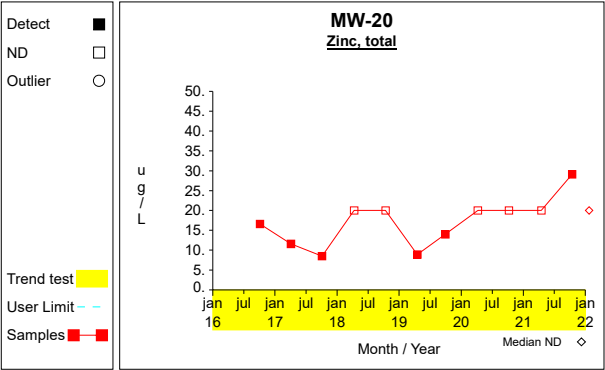
Graph 147



Graph 148

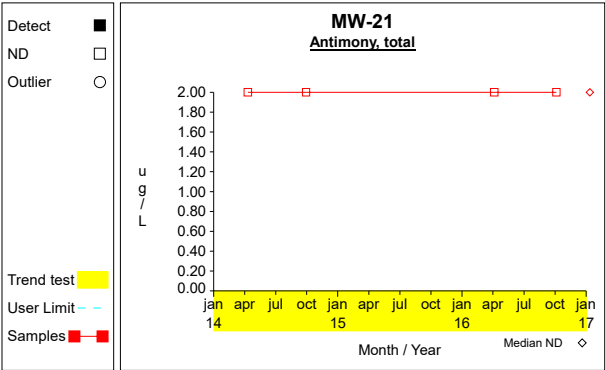


Graph 149

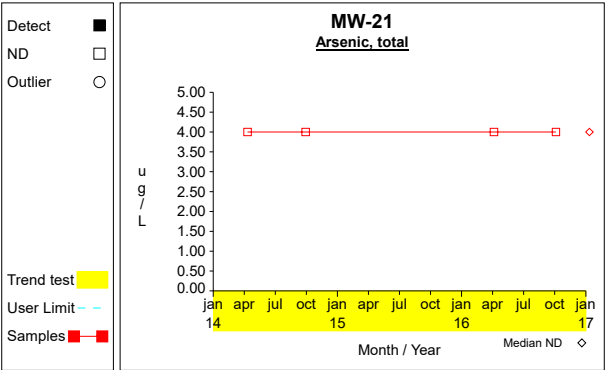


Graph 150

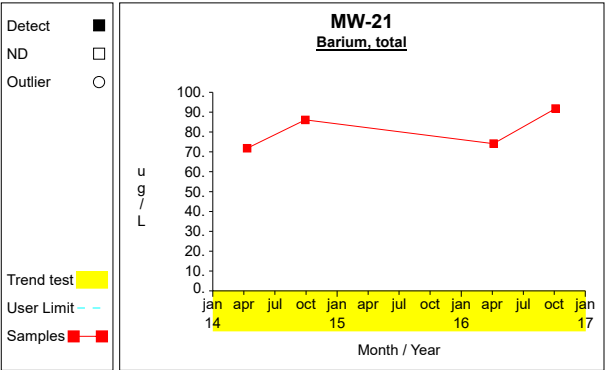
Time Series



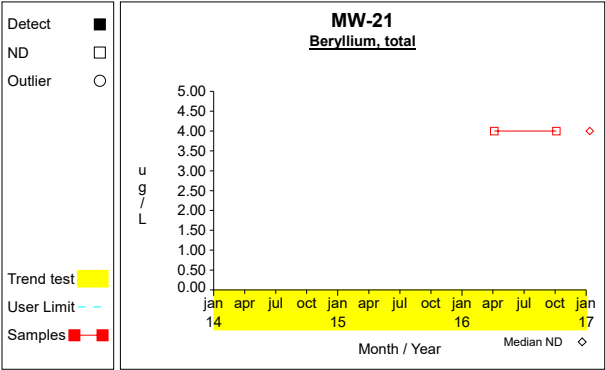
Graph 151



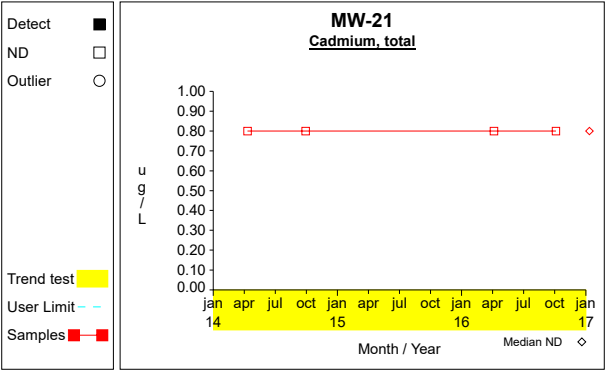
Graph 152



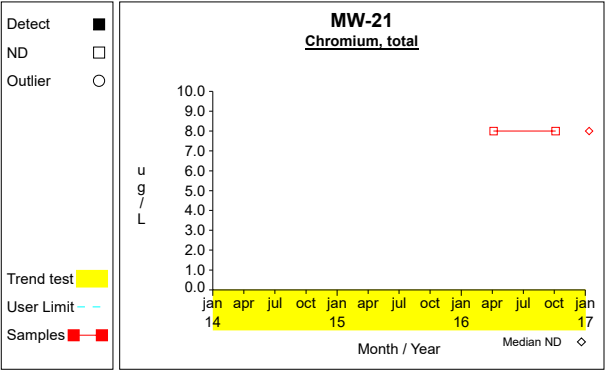
Graph 153



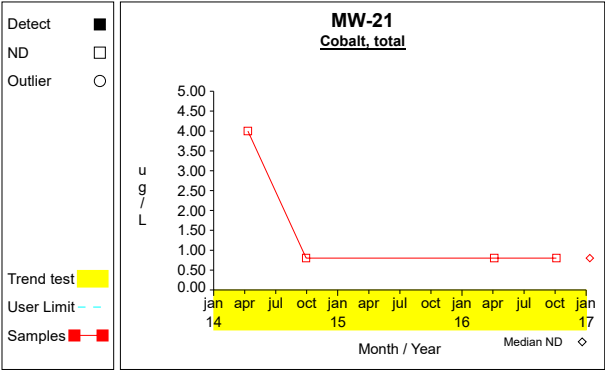
Graph 154



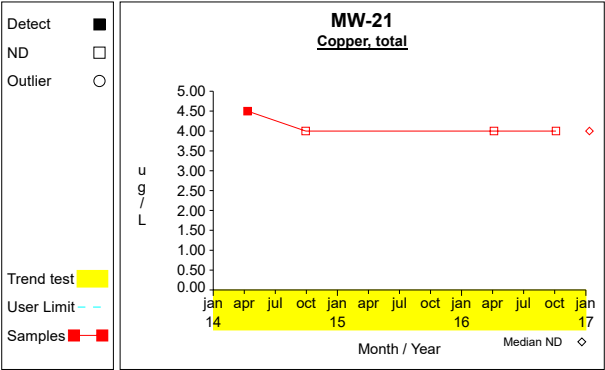
Graph 155



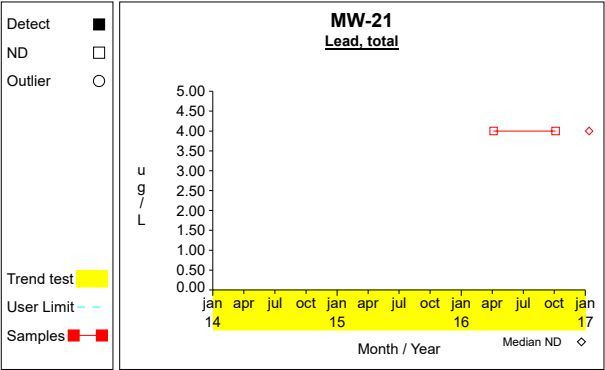
Graph 156



Graph 157

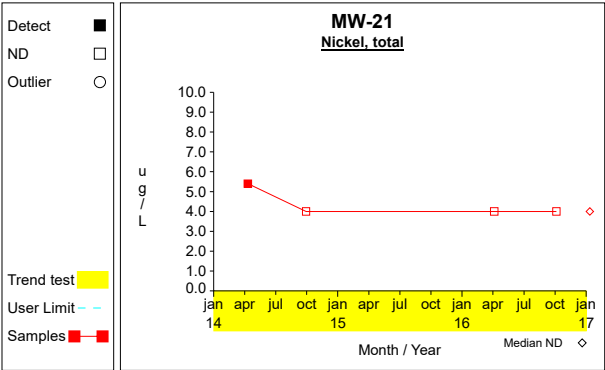


Graph 158

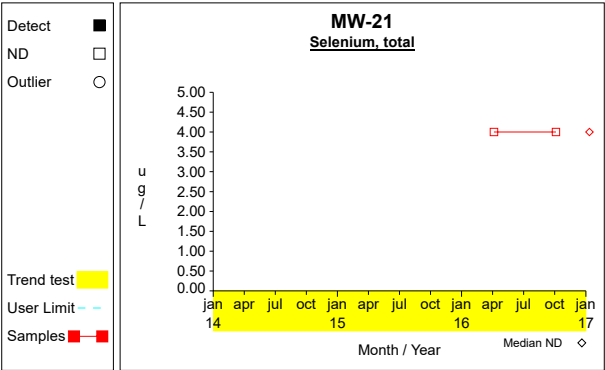


Graph 159

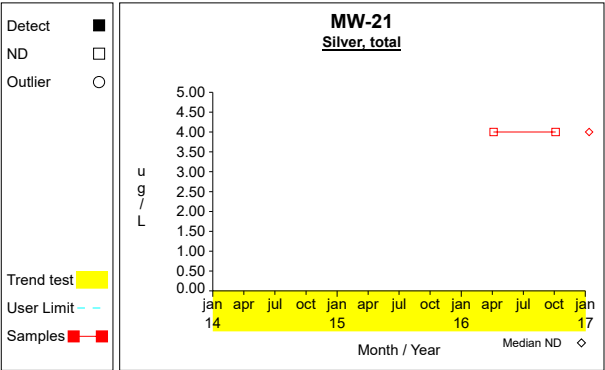
Time Series



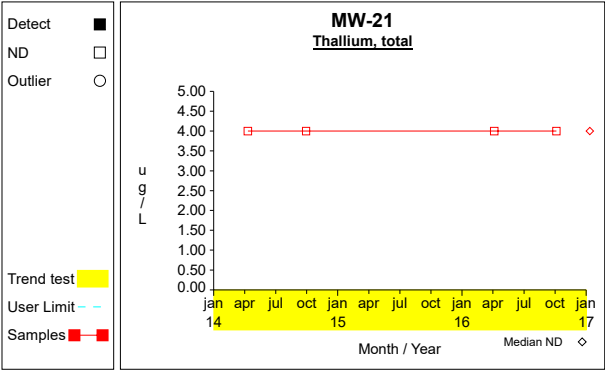
Graph 160



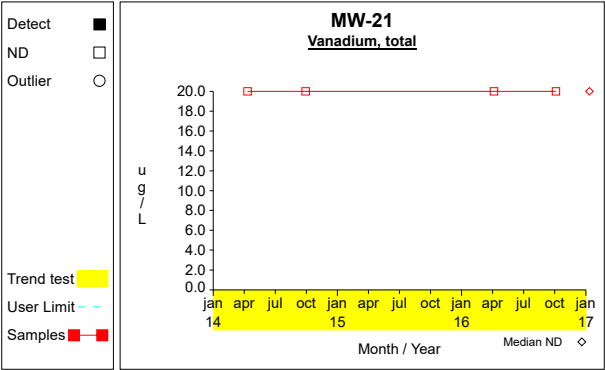
Graph 161



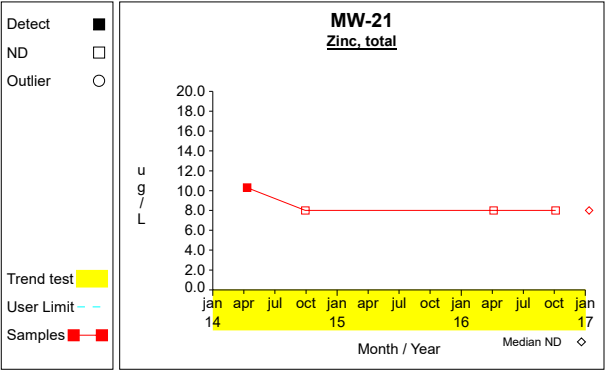
Graph 162



Graph 163



Graph 164



Graph 165

Attachment E

Statistics for Trace Metals

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Antimony, total	ug/L	MW-10	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-10	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-10	13	6	19	93.2692	5.7786	79.2000	94.4000	93.2692	93.2692	130.8302	normal		
Beryllium, total	ug/L	MW-10	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-10	13	6	19			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-10	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-10	13	6	19			0.4000	0.5000			0.8000	nonpar	.99	**
Copper, total	ug/L	MW-10	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-10	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-10	13	6	19			4.0000	5.0000			8.9000	nonpar	.99	**
Selenium, total	ug/L	MW-10	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-10	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-10	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-10	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-10	13	6	19			20.0000	5.0000			8.0000	nonpar	.99	**
Antimony, total	ug/L	MW-11	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-11	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-11	13	6	19	98.2846	11.1807	85.9000	107.0000	98.2846	98.6145	170.9592	normal		
Beryllium, total	ug/L	MW-11	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-11	13	6	19			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-11	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-11	13	6	19			0.4000	0.5000			1.3000	nonpar	.99	**
Copper, total	ug/L	MW-11	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-11	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-11	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Selenium, total	ug/L	MW-11	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-11	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-11	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-11	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-11	11	6	19	18.8636	7.3984	20.0000	15.0000	18.8636	18.8636	66.9533	normal		
Antimony, total	ug/L	MW-12	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-12	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-12	13	6	19	426.6154	124.8710	287.0000	329.0000	426.6154	426.6154	1238.2766	normal		
Beryllium, total	ug/L	MW-12	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-12	13	6	19			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-12	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-12	12	6	19	2.2167	1.6943	1.1000	1.1000	2.2167	2.2167	13.2295	normal		
Copper, total	ug/L	MW-12	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-12	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-12	13	6	19	5.5231	1.6878	4.0000	5.0000	5.5231	5.5231	16.4936	normal		
Selenium, total	ug/L	MW-12	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-12	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-12	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-12	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-12	13	6	19			20.0000	8.8000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-13	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Arsenic, total	ug/L	MW-13	13	6	19	20.7615	6.7783	9.5000	8.6000	20.7615	20.7615	64.8208	normal		
Barium, total	ug/L	MW-13	13	6	19	2603.6923	1104.8885	391.0000	528.0000	2603.6923	2603.6923	9785.4675	normal		
Beryllium, total	ug/L	MW-13	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-13	13	6	19			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-13	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-13	13	6	19	9.5846	4.3060	6.4000	6.9000	9.5846	9.5846	37.5734	normal		
Copper, total	ug/L	MW-13	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-13	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-13	13	6	19	7.7000	6.0226	5.1000	5.5000	7.7000	7.7000	46.8469	normal		
Selenium, total	ug/L	MW-13	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-13	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-13	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-13	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-13	13	6	19			20.0000	5.0000			8.0000	nonpar	.99	**
Antimony, total	ug/L	MW-14	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-14	13	6	19	26.7385	37.4715	7.6000	7.5000	26.7385	26.7385	270.3034	normal		
Barium, total	ug/L	MW-14	13	6	19	1024.3077	515.7174	740.0000	873.0000	1024.3077	1024.3077	4376.4705	normal		
Beryllium, total	ug/L	MW-14	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-14	13	6	19			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-14	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-14	13	6	19	1.2077	0.8311	0.5000	0.5000	1.2077	1.2077	6.6100	normal		
Copper, total	ug/L	MW-14	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-14	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-14	13	6	19			4.0000	5.0000			5.7000	nonpar	.99	**
Selenium, total	ug/L	MW-14	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-14	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-14	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-14	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-14	13	6	19			20.0000	6.3000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-15	15	6	22			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-15	15	6	22	8.5867	7.4323	4.0000	2.0000	8.5867	8.5867	56.8963	normal		
Barium, total	ug/L	MW-15	15	6	22	304.6000	86.5223	327.0000	431.0000	304.6000	366.1082	866.9952	normal		
Beryllium, total	ug/L	MW-15	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-15	15	6	22			0.8000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-15	13	6	19			8.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-15	15	6	22	8.5333	4.7723	7.9000	11.8000	8.5333	8.5333	39.5535	normal		
Copper, total	ug/L	MW-15	15	6	22			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-15	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-15	14	6	22	10.2214	2.8861	11.1000	12.9000	10.2214	10.7354	28.9810	normal		
Selenium, total	ug/L	MW-15	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-15	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-15	15	6	22			2.0000	0.5000			4.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-15	15	6	22			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-15	15	6	22			20.0000	5.0000			10.2000	nonpar	.99	**
Antimony, total	ug/L	MW-17	13	6	19			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-17	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Barium, total	ug/L	MW-17	13	6	19	252.4615	84.5336	212.0000	211.0000	252.4615	252.4615	801.9302	normal		
Beryllium, total	ug/L	MW-17	13	6	19			4.0000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-17	13	6	19			0.8000	0.6000			1.8000	nonpar	.99	**
Chromium, total	ug/L	MW-17	13	6	19			8.0000	1.9000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-17	13	6	19	4.4077	4.1476	5.4000	7.3000	4.4077	4.4077	31.3670	normal		
Copper, total	ug/L	MW-17	13	6	19			4.0000	5.0000			8.1000	nonpar	.99	**
Lead, total	ug/L	MW-17	13	6	19			4.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-17	13	6	19	11.5923	9.8607	23.9000	21.0000	17.9167	19.9289	75.6865	normal		
Selenium, total	ug/L	MW-17	13	6	19			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-17	13	6	19			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-17	13	6	19			2.0000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-17	13	6	19			20.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-17	13	6	19			20.0000	13.2000			20.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 4

**Dixon's Test Outliers
1% Significance Level**

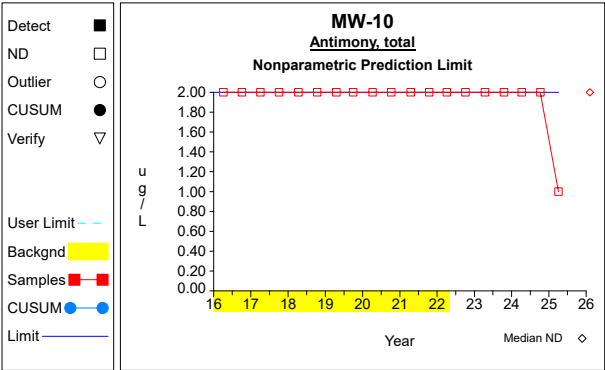
Constituent	Units	Well	Date	Result	ND Qualifier	Date Range	N	Critical Value
Zinc, total	ug/L	MW-11	04/04/2016	73.0000		04/04/2016-04/04/2022	13	0.6425
Zinc, total	ug/L	MW-11	10/04/2016	135.0000		04/04/2016-04/04/2022	13	0.6425
Cobalt, total	ug/L	MW-12	04/03/2017	13.7000		04/04/2016-04/04/2022	13	0.6174
Nickel, total	ug/L	MW-15	04/10/2014	31.1000		04/10/2014-04/04/2022	15	0.6177

N = Total number of independent measurements in background at each well.

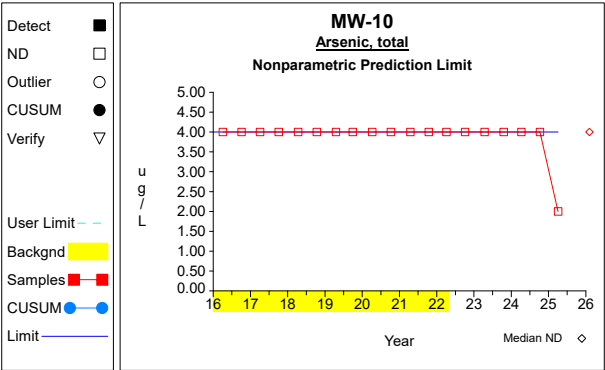
Date Range = Dates of the first and last measurements included in background at each well.

Critical Value depends on the significance level and on N-1 when the two most extreme values are tested or N for the most extreme value.

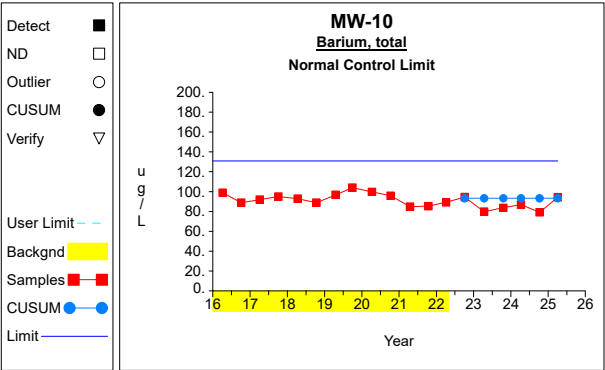
Intra-Well Control Charts / Prediction Limits



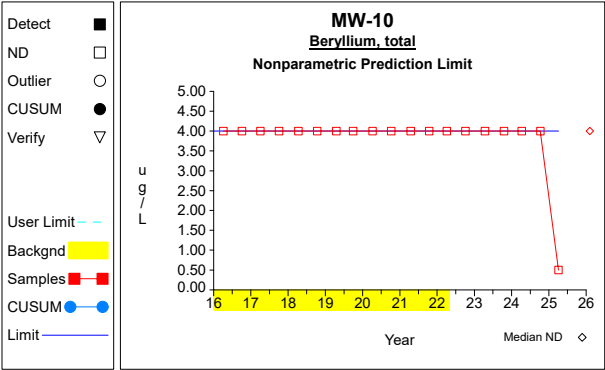
Graph 1



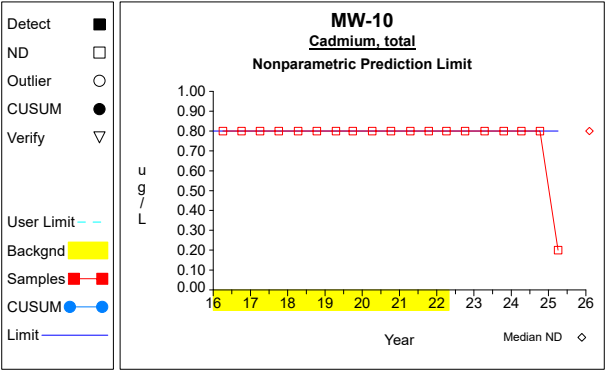
Graph 2



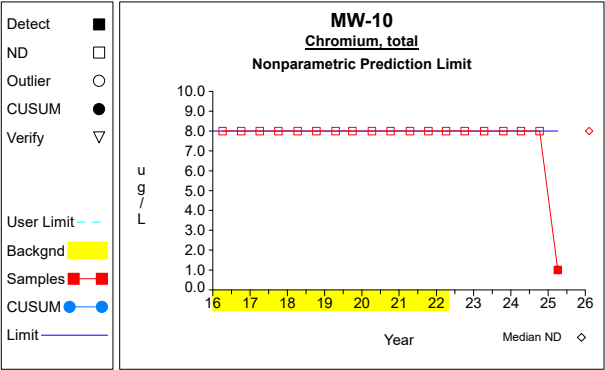
Graph 3



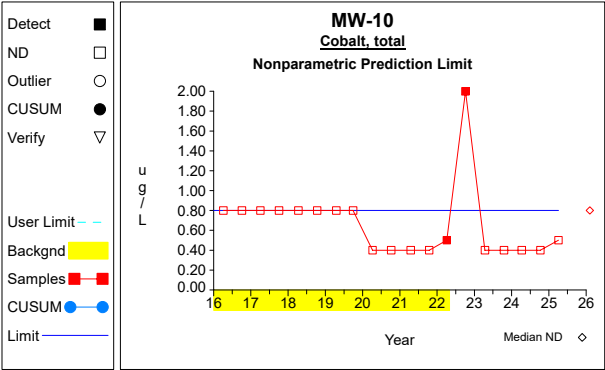
Graph 4



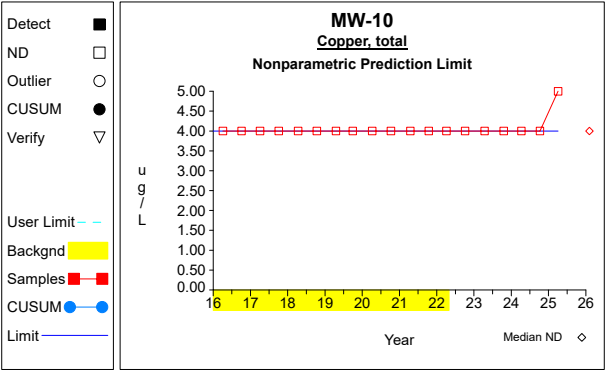
Graph 5



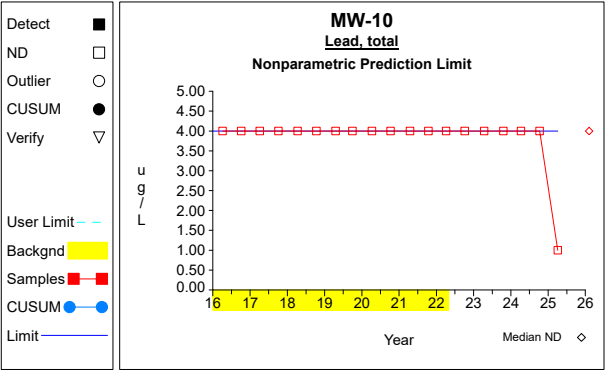
Graph 6



Graph 7

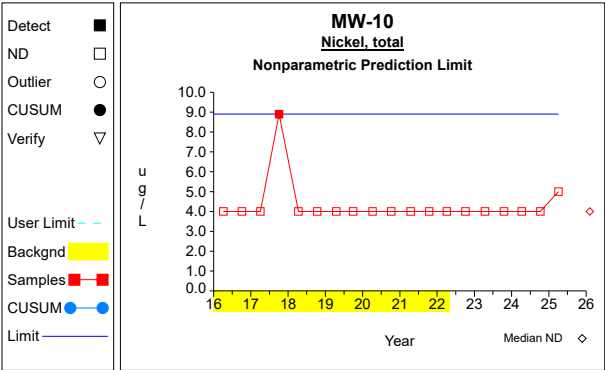


Graph 8

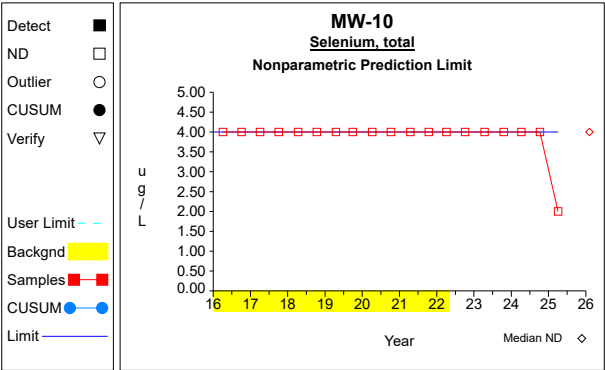


Graph 9

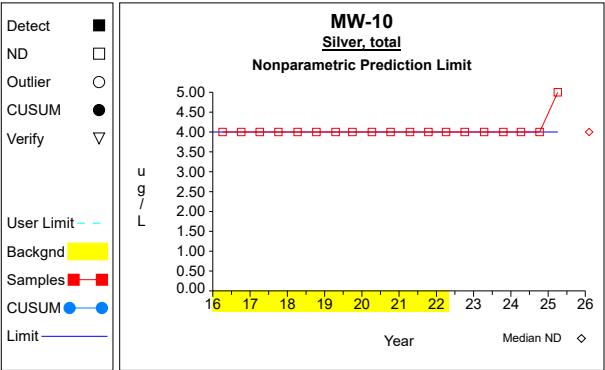
Intra-Well Control Charts / Prediction Limits



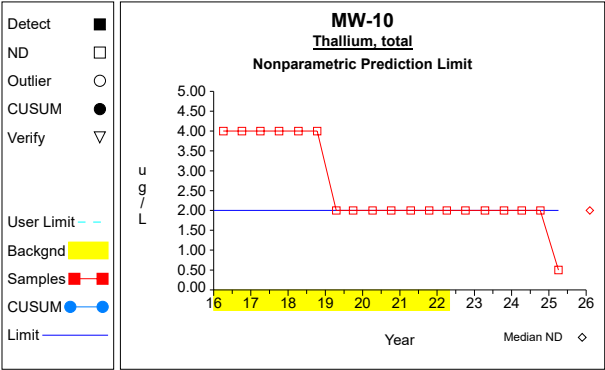
Graph 10



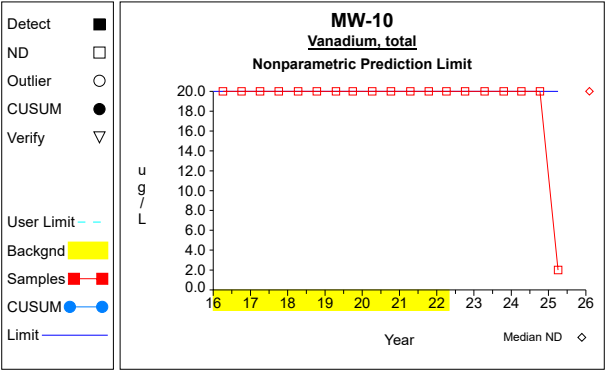
Graph 11



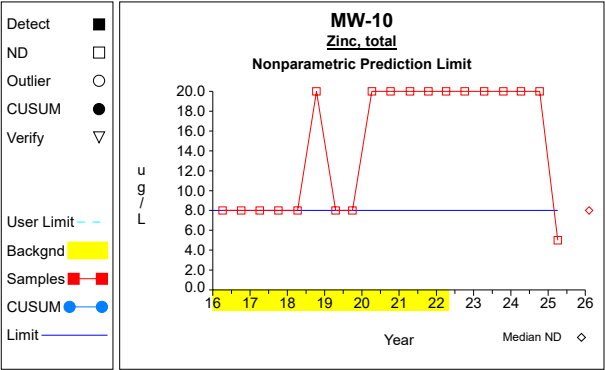
Graph 12



Graph 13

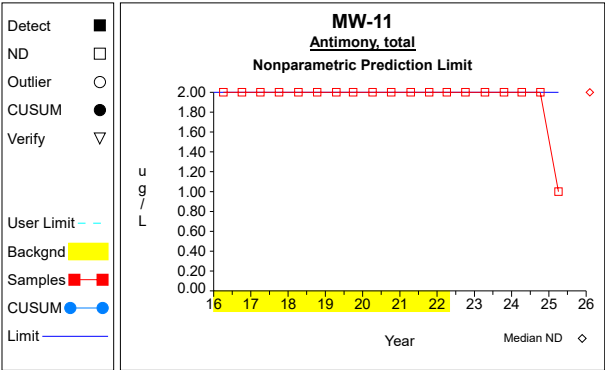


Graph 14

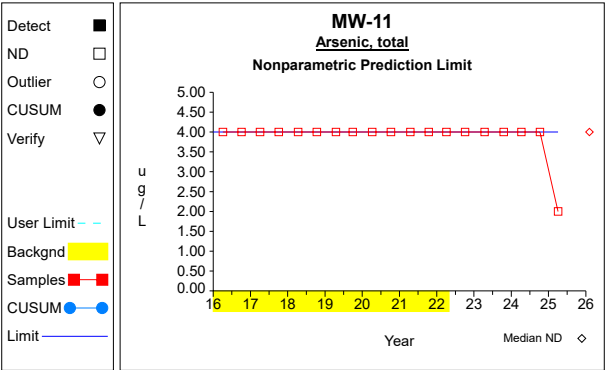


Graph 15

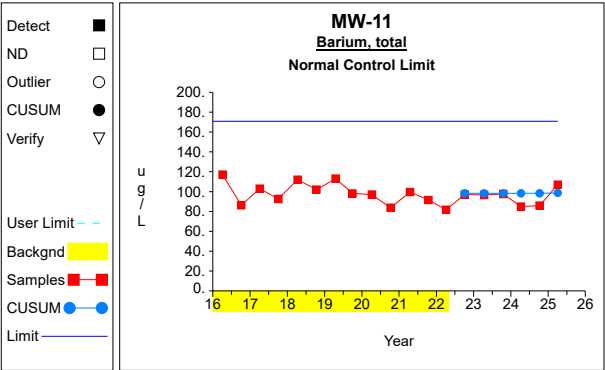
Intra-Well Control Charts / Prediction Limits



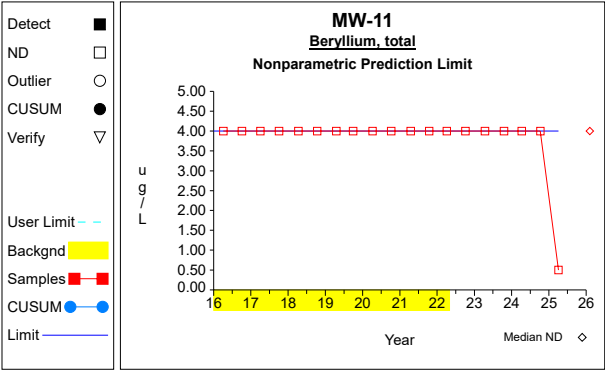
Graph 16



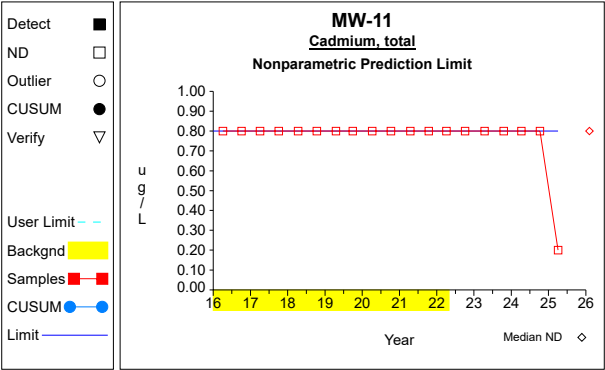
Graph 17



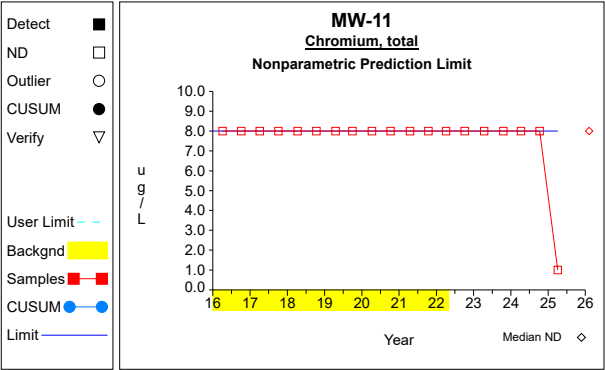
Graph 18



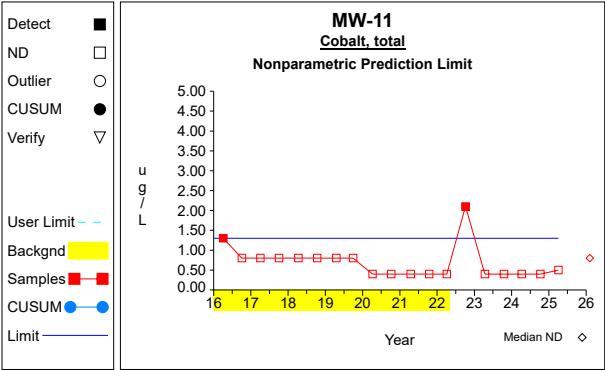
Graph 19



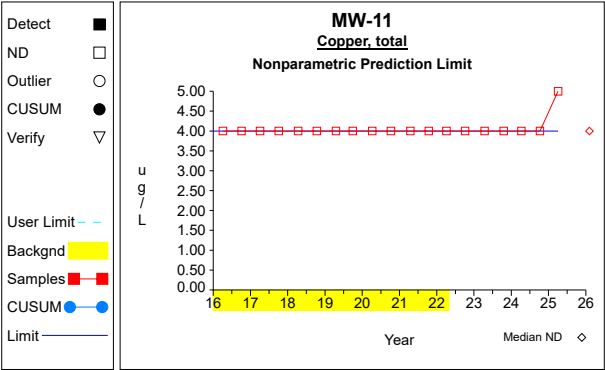
Graph 20



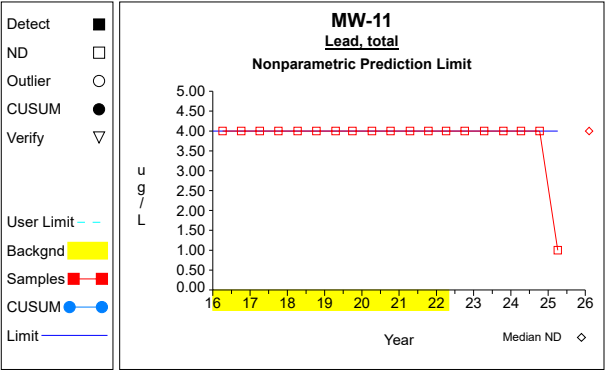
Graph 21



Graph 22

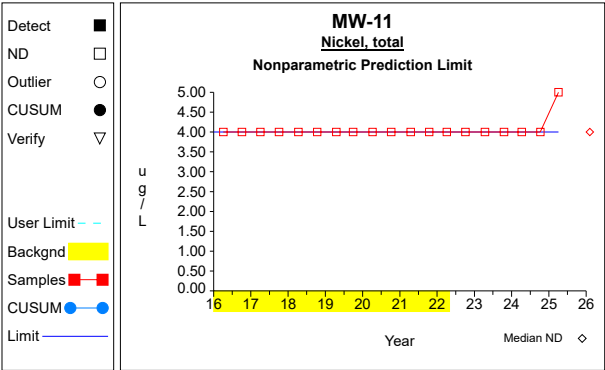


Graph 23

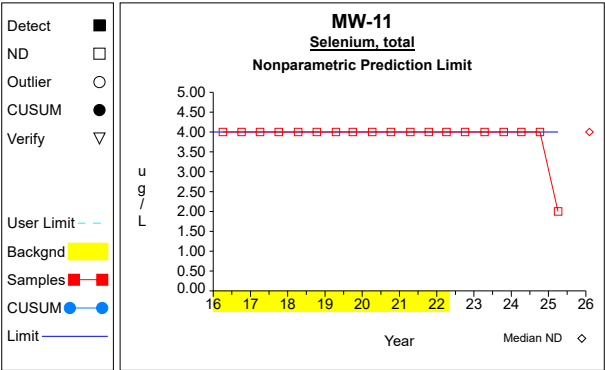


Graph 24

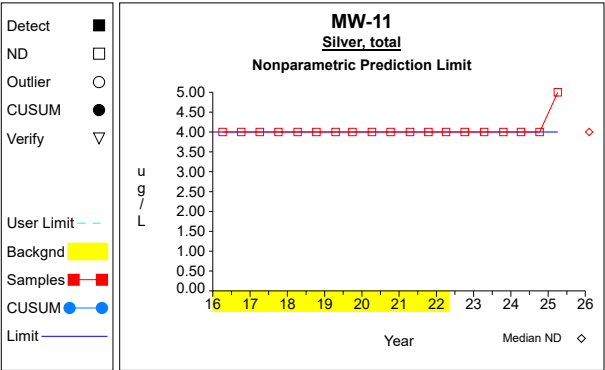
Intra-Well Control Charts / Prediction Limits



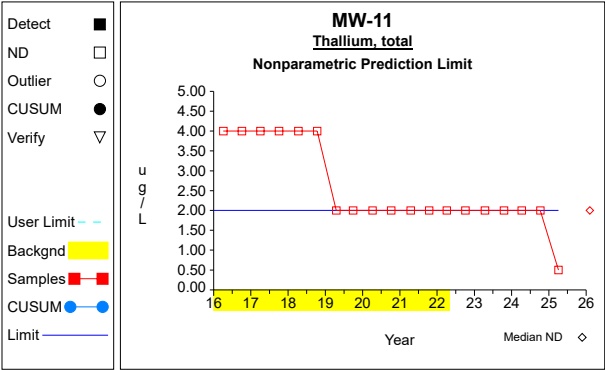
Graph 25



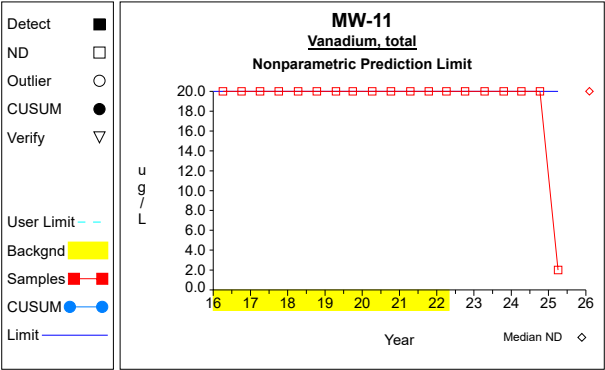
Graph 26



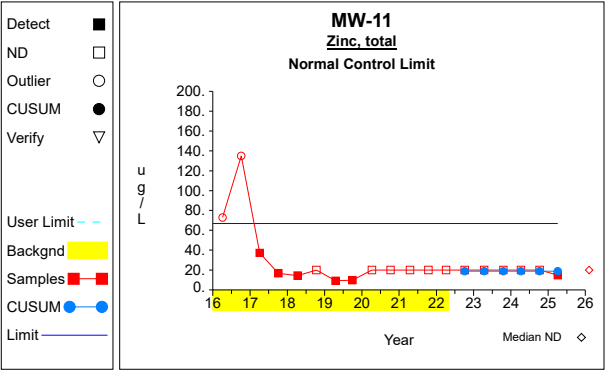
Graph 27



Graph 28

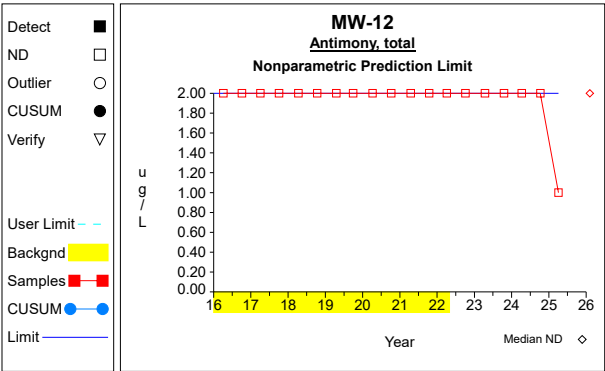


Graph 29

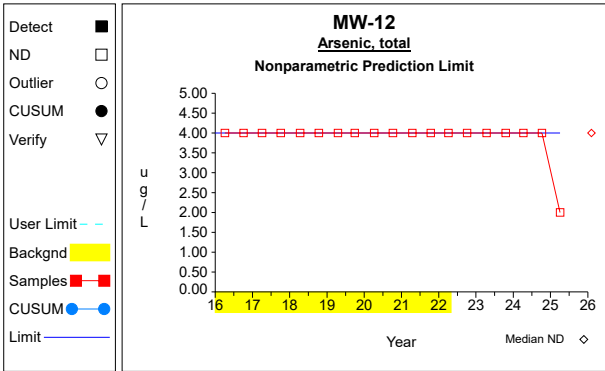


Graph 30

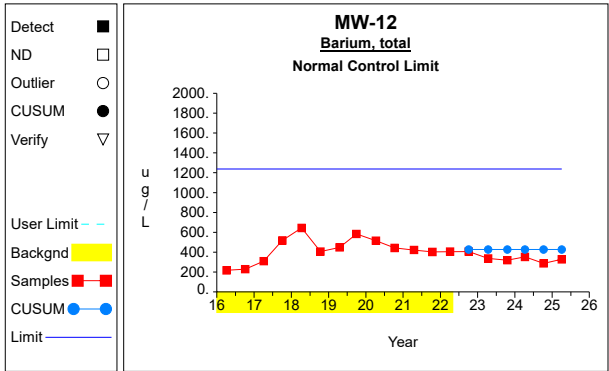
Intra-Well Control Charts / Prediction Limits



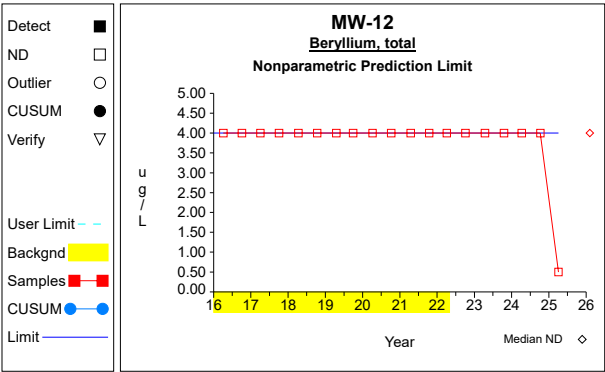
Graph 31



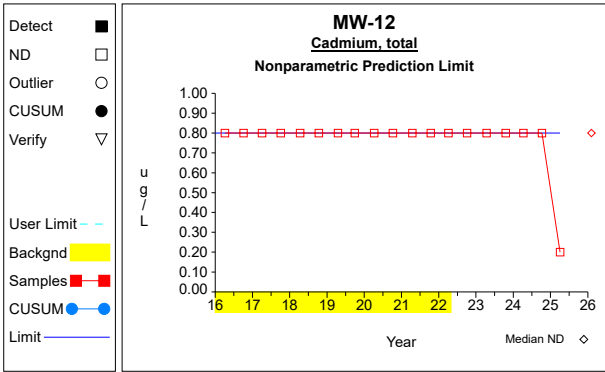
Graph 32



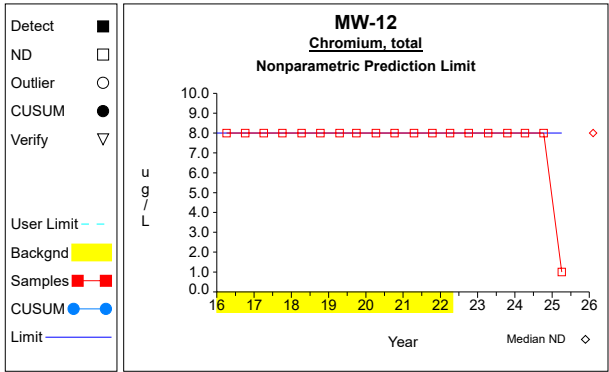
Graph 33



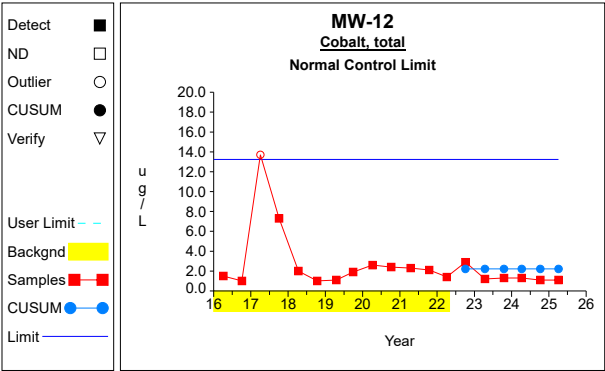
Graph 34



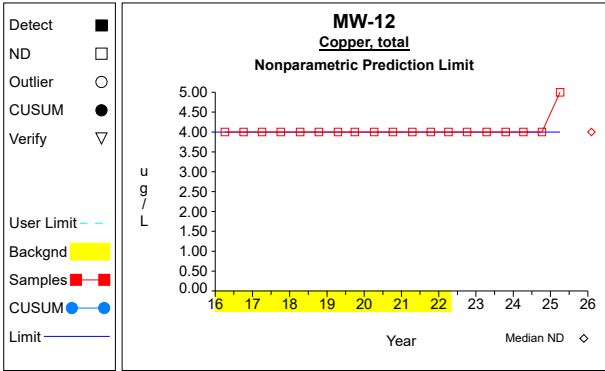
Graph 35



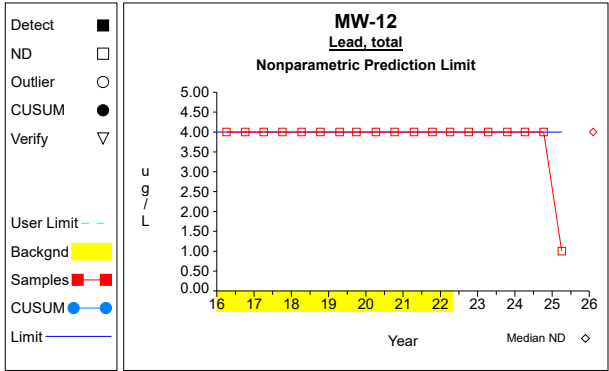
Graph 36



Graph 37



Graph 38



Graph 39

Detect ■
ND □
Outlier ○
CUSUM ●
Verify ▽

MW-12
Nickel, total
Normal Control Limit

u g / L

Year

Median ND

Legend:

- User Limit
- Backgnd
- Samples
- CUSUM
- Limit
- Median ND

MW-12
Selenium, total
Nonparametric Prediction Limit

Legend:

- Detect: ■
- ND: □
- Outlier: ○
- CUSUM: ●
- Verify: ▽
- User Limit: —
- Backgnd:
- Samples: ■
- CUSUM: ●
- Limit: —

Y-axis: ug / L (0.00 to 5.00)
X-axis: Year (16 to 26)

Key values: Limit = 4.00 ug/L, Backgnd = 0.00 to 2.25 ug/L, User Limit = 4.00 ug/L, Samples = 2.00 ug/L, CUSUM = 4.00 ug/L, Limit = 4.00 ug/L.

MW-12
Silver, total

Nonparametric Prediction Limit

u
g
/ L

Year

Median ND ◇

Detect ■

ND □

Outlier ○

CUSUM ●

Verify ▽

User Limit - -

Backgnd

Samples ■ ■

CUSUM ● ●

Limit —

MW-12
Thallium, total

Nonparametric Prediction Limit

Legend:

- Detect: ■
- ND: □
- Outlier: ○
- CUSUM: ●
- Verify: ▽
- User Limit: — (red dashed)
- Backgnd: ■ (yellow)
- Samples: ■ (red)
- CUSUM: ● (blue)
- Limit: — (blue)

Y-axis: $u \text{ g} / \text{L}$

X-axis: Year

Median ND: ◇

MW-12
Vanadium, total
 Nonparametric Prediction Limit

Legend:

- Detect: ■
- ND: □
- Outlier: ○
- CUSUM: ●
- Verify: ▽
- User Limit: ---
- Backgnd:
- Samples: ■
- CUSUM: ●
- Limit: —

Y-axis: ug / L

X-axis: Year

Median ND: ◇

MW-12
Zinc, total

Nonparametric Prediction Limit

u g / L

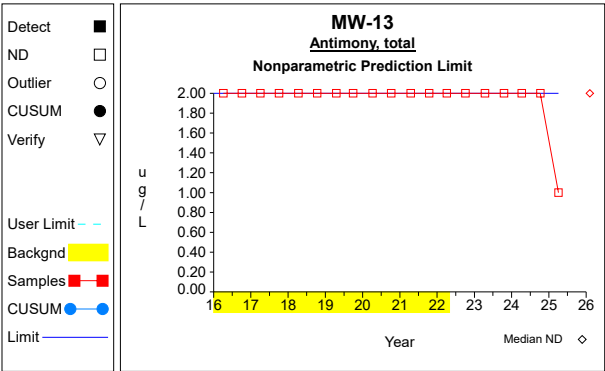
Year

Median ND

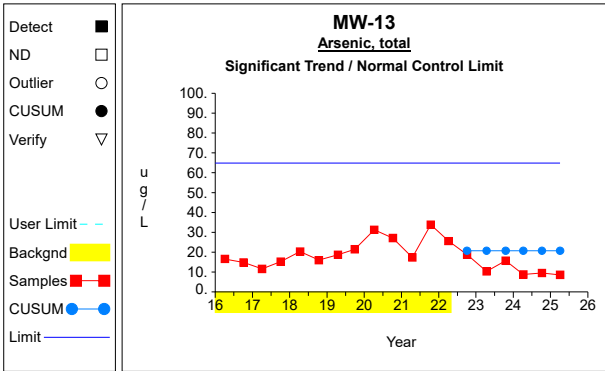
Detect ■
ND □
Outlier ○
CUSUM ●
Verify ▽
User Limit - -
Backgnd
Samples ■
CUSUM ●
Limit —

Prepared by: Otter Creek Environmental

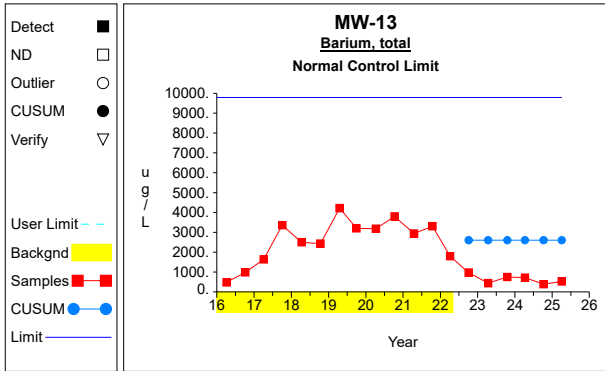
Intra-Well Control Charts / Prediction Limits



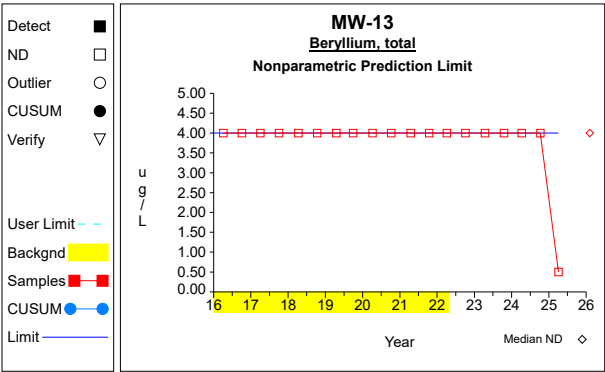
Graph 46



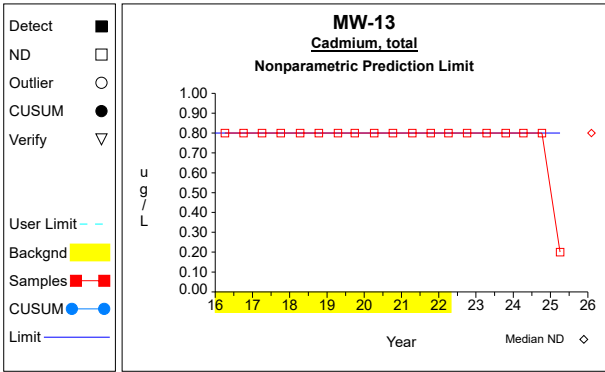
Graph 47



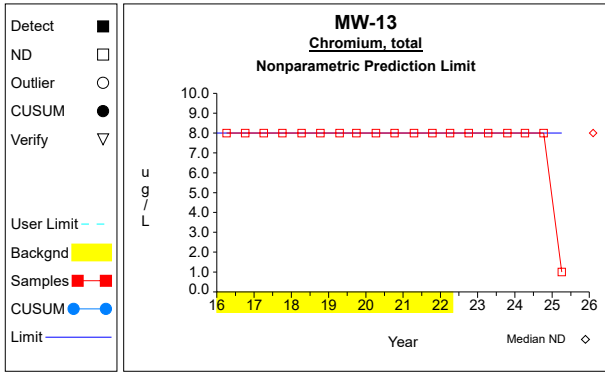
Graph 48



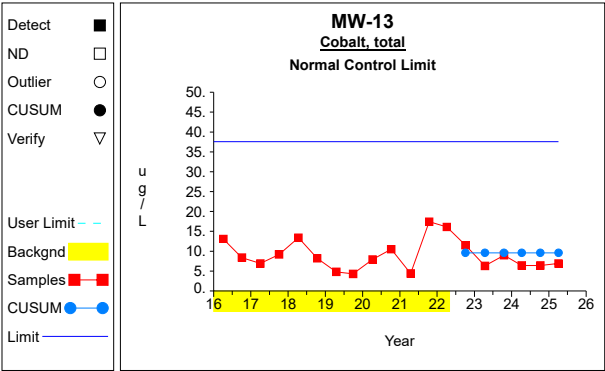
Graph 49



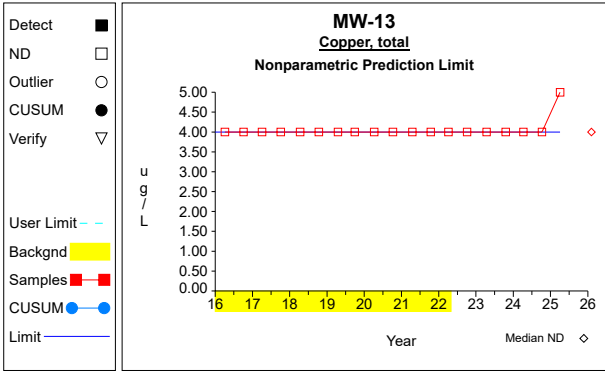
Graph 50



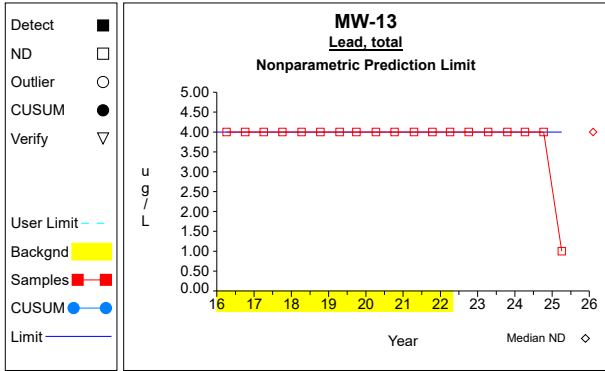
Graph 51



Graph 52

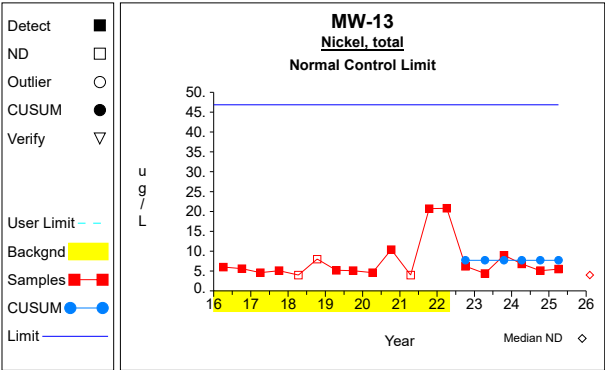


Graph 53

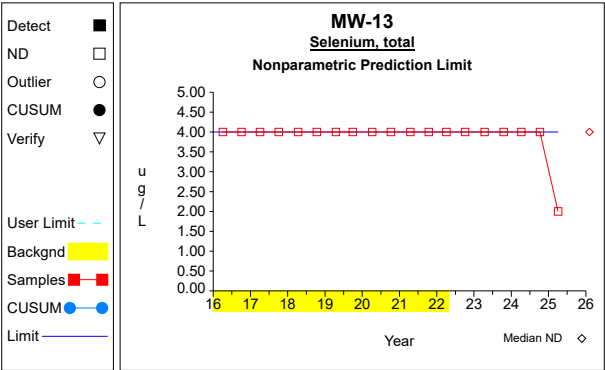


Graph 54

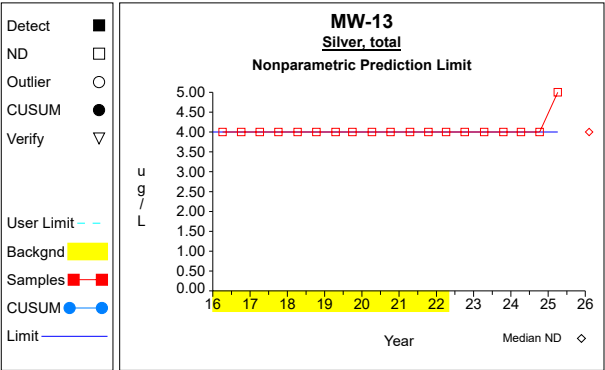
Intra-Well Control Charts / Prediction Limits



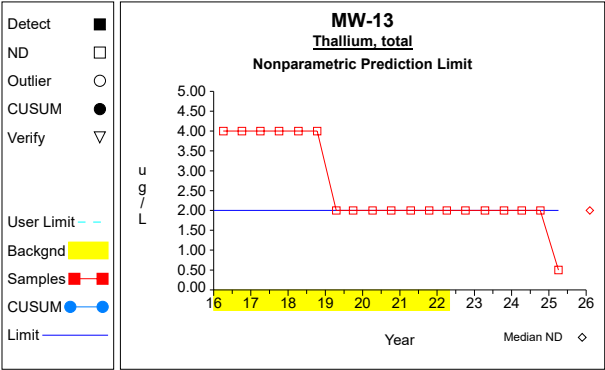
Graph 55



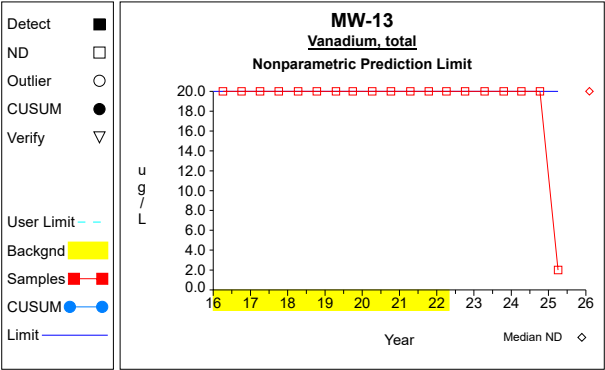
Graph 56



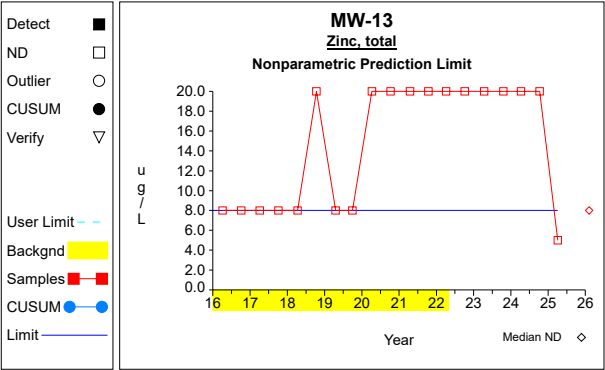
Graph 57



Graph 58

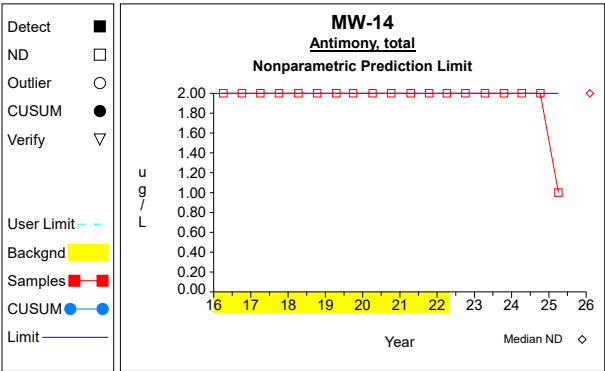


Graph 59

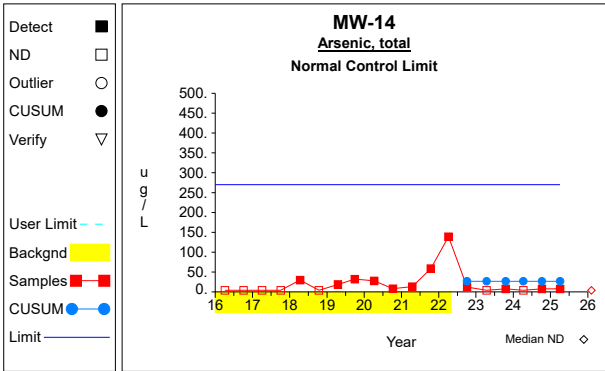


Graph 60

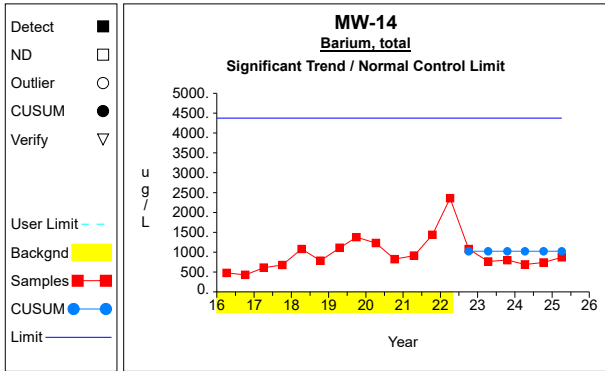
Intra-Well Control Charts / Prediction Limits



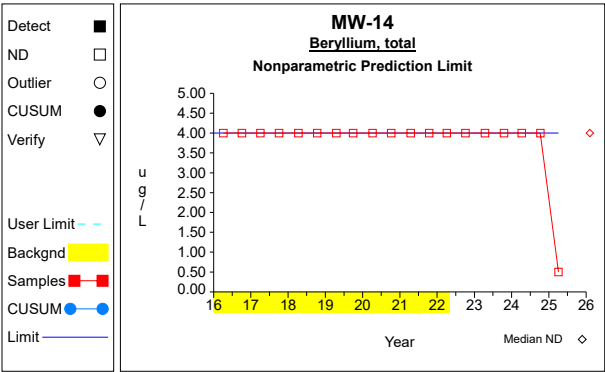
Graph 61



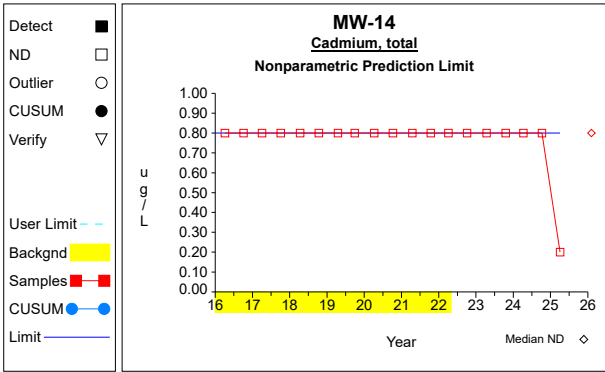
Graph 62



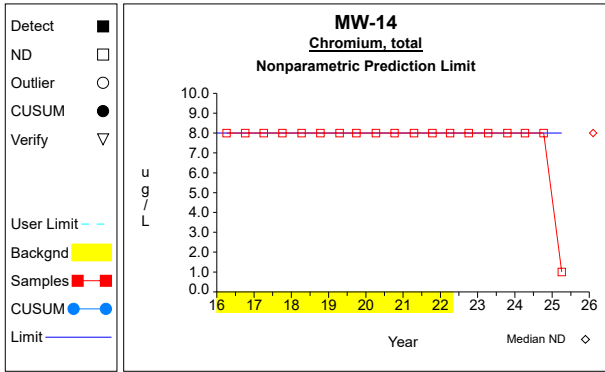
Graph 63



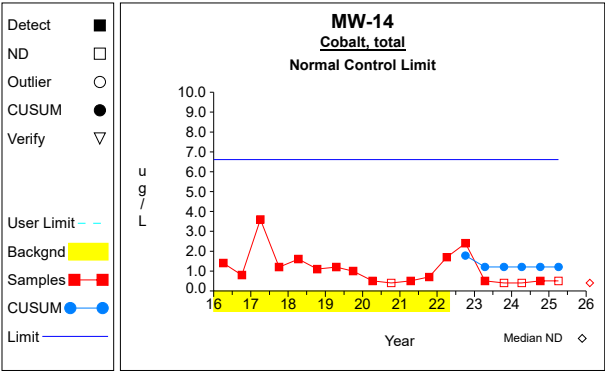
Graph 64



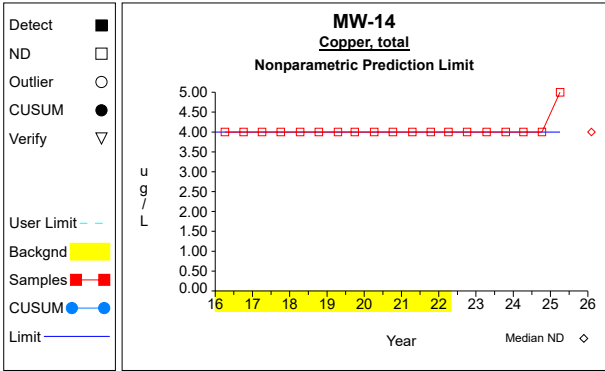
Graph 65



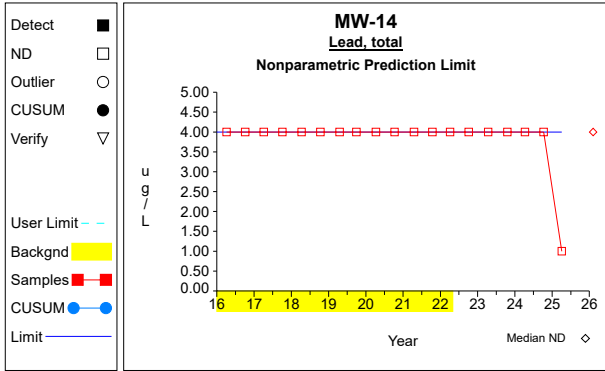
Graph 66



Graph 67

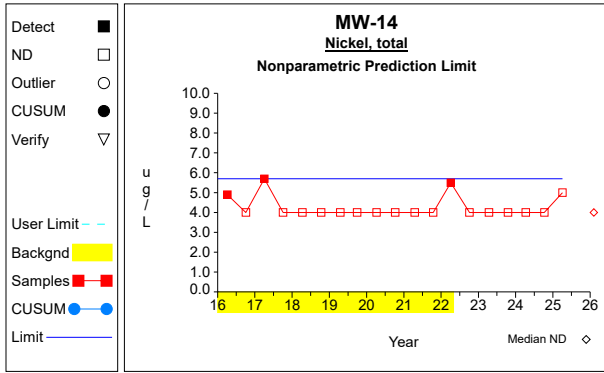


Graph 68

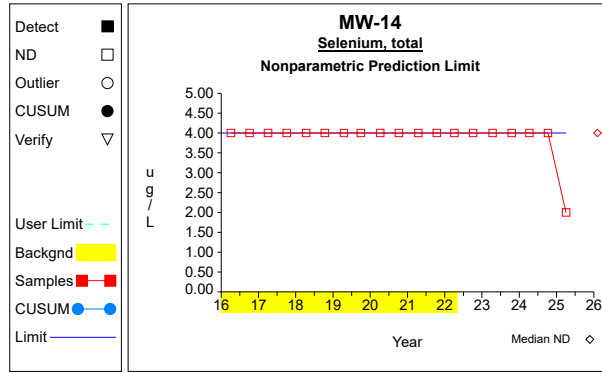


Graph 69

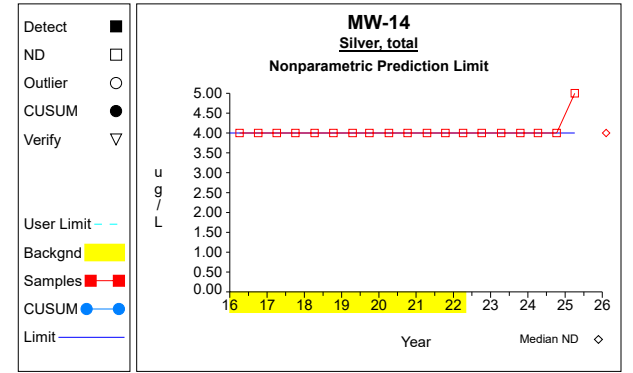
Intra-Well Control Charts / Prediction Limits



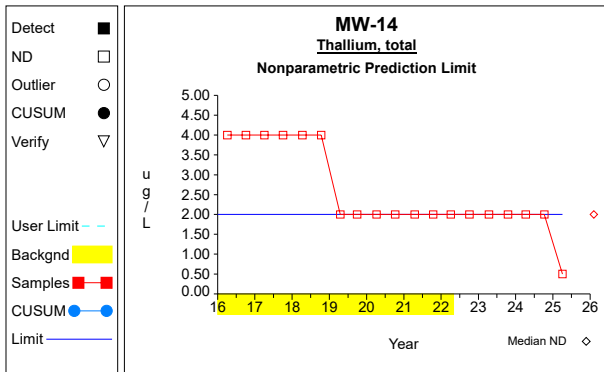
Graph 70



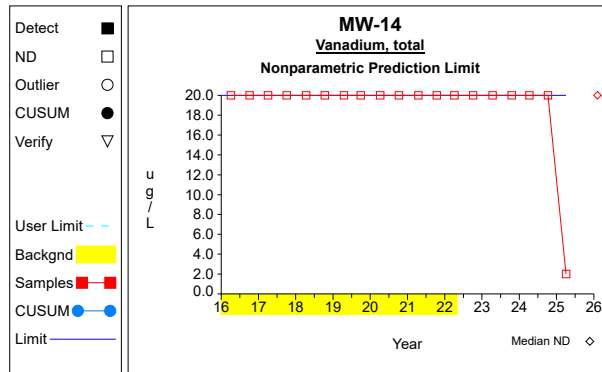
Graph 71



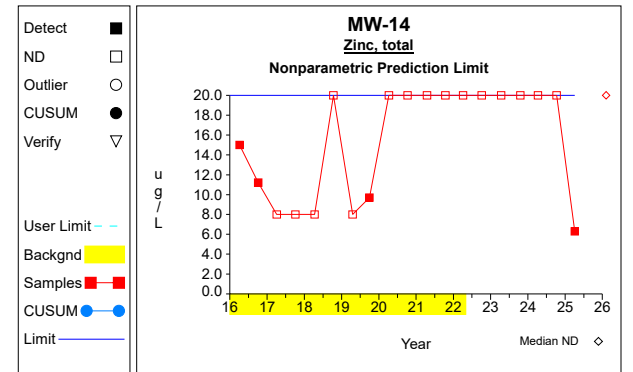
Graph 72



Graph 73

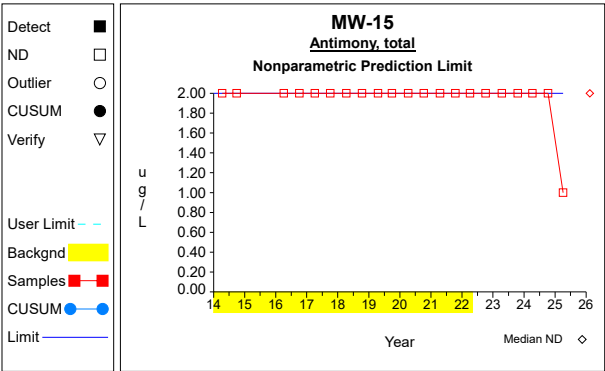


Graph 74

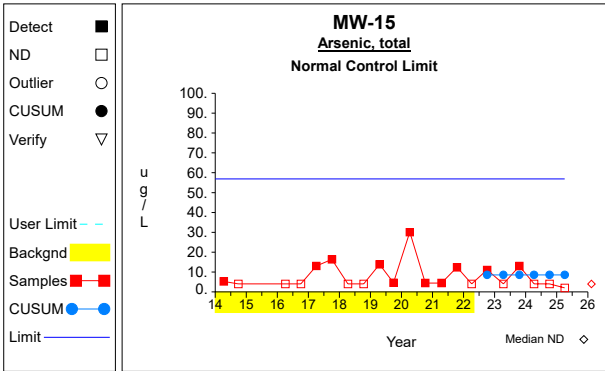


Graph 75

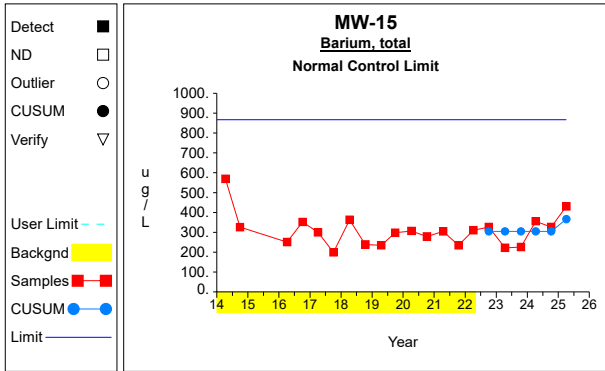
Intra-Well Control Charts / Prediction Limits



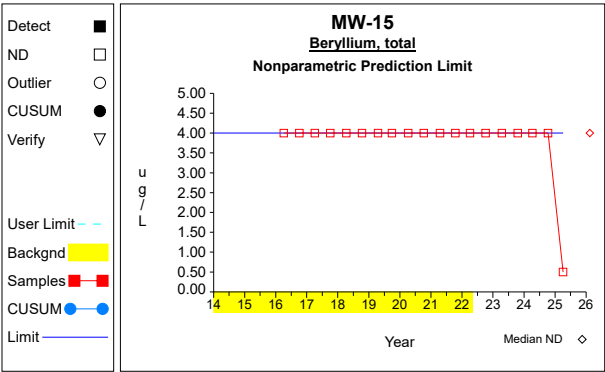
Graph 76



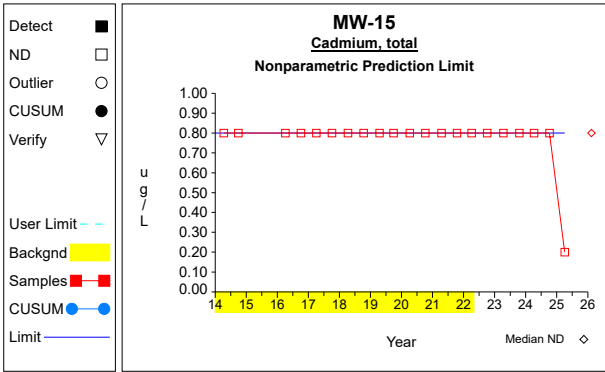
Graph 77



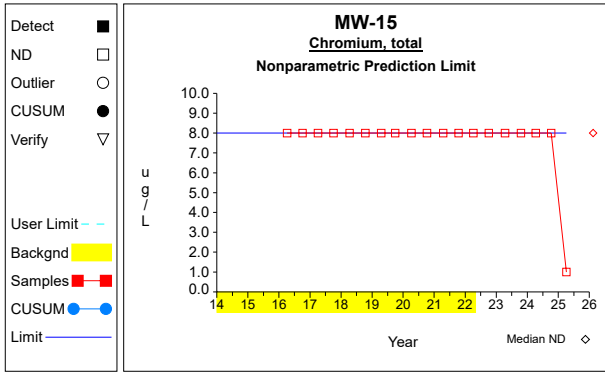
Graph 78



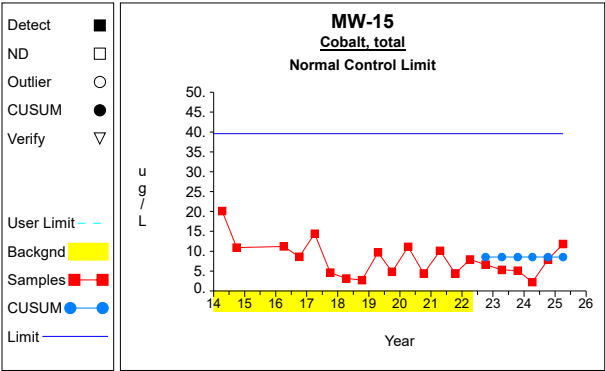
Graph 79



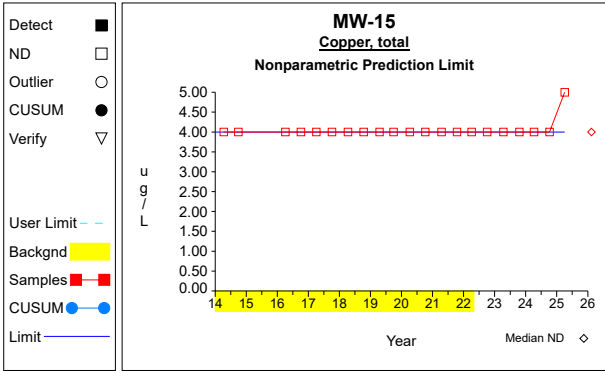
Graph 80



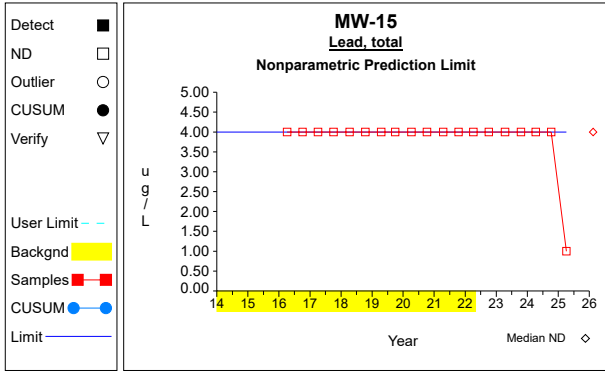
Graph 81



Graph 82

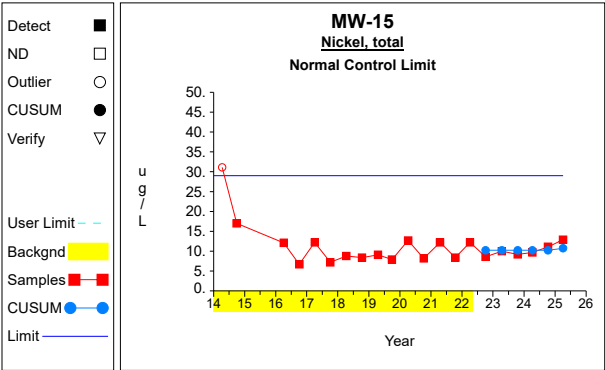


Graph 83

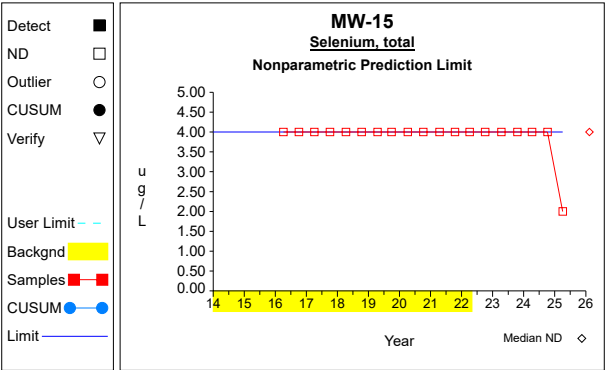


Graph 84

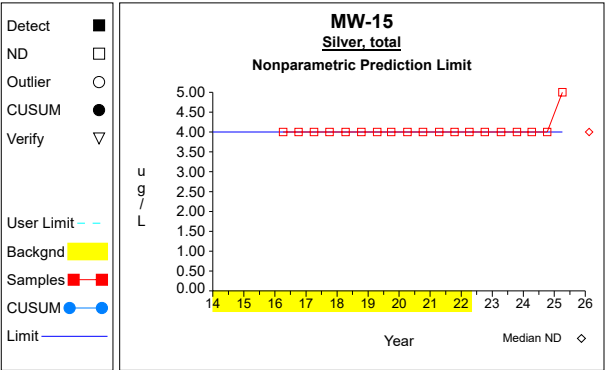
Intra-Well Control Charts / Prediction Limits



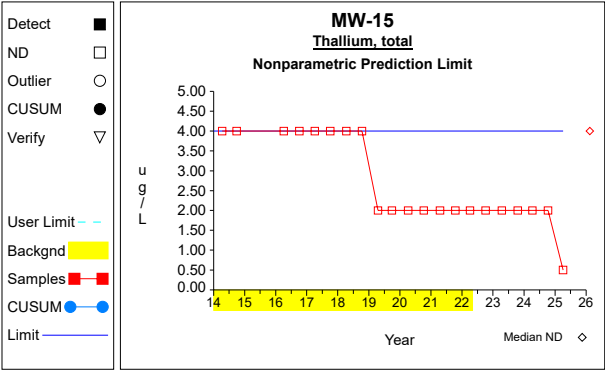
Graph 85



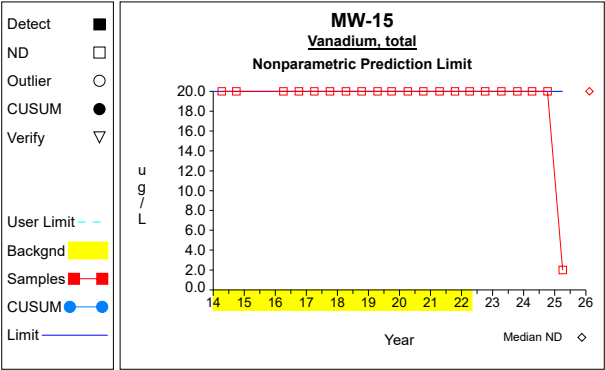
Graph 86



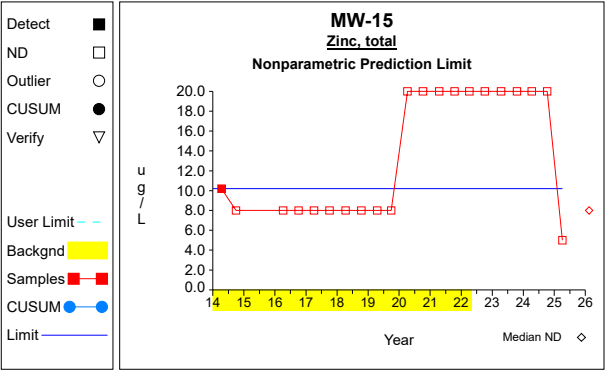
Graph 87



Graph 88

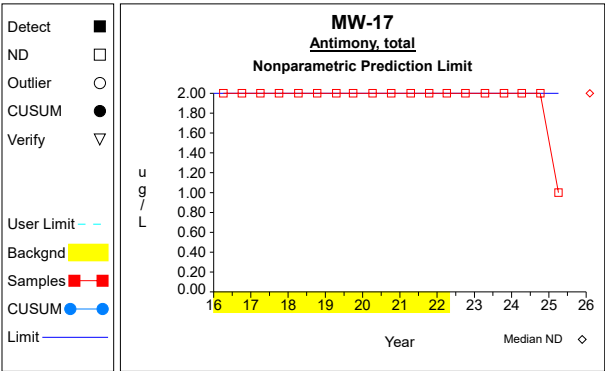


Graph 89

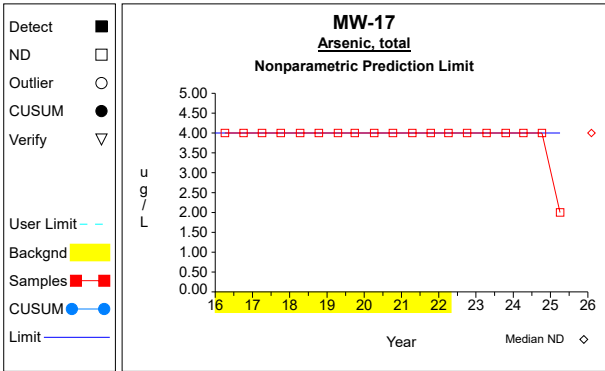


Graph 90

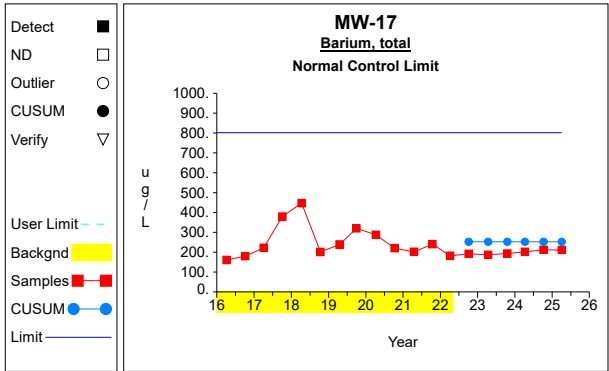
Intra-Well Control Charts / Prediction Limits



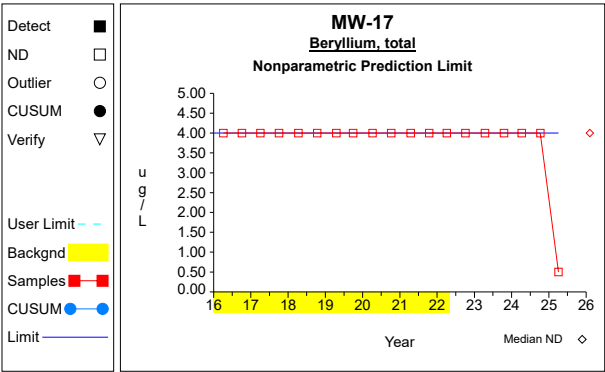
Graph 91



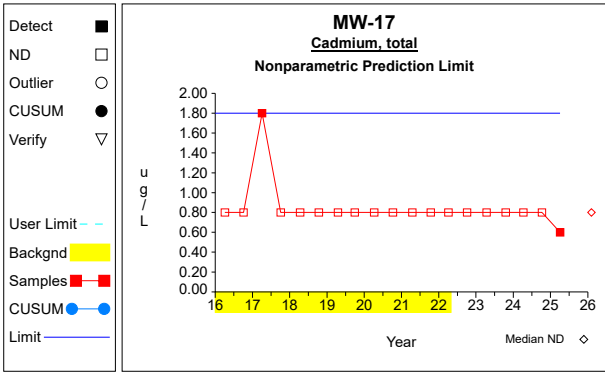
Graph 92



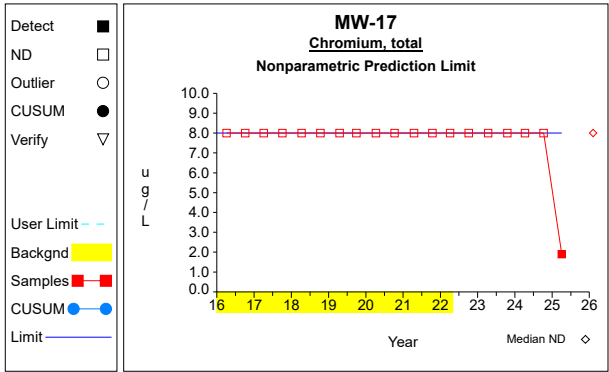
Graph 93



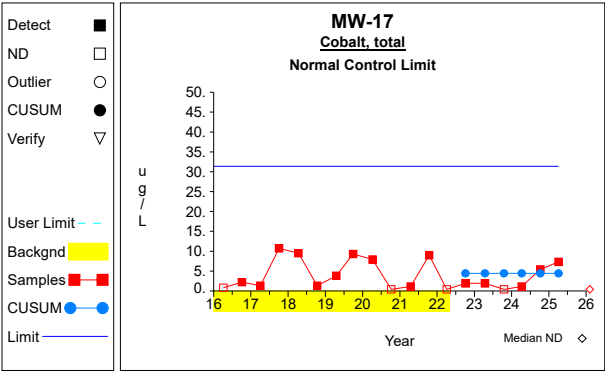
Graph 94



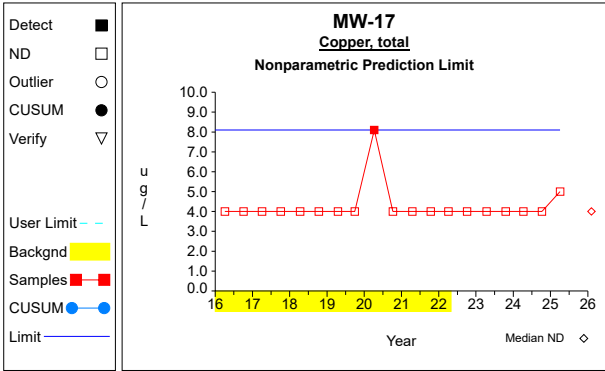
Graph 95



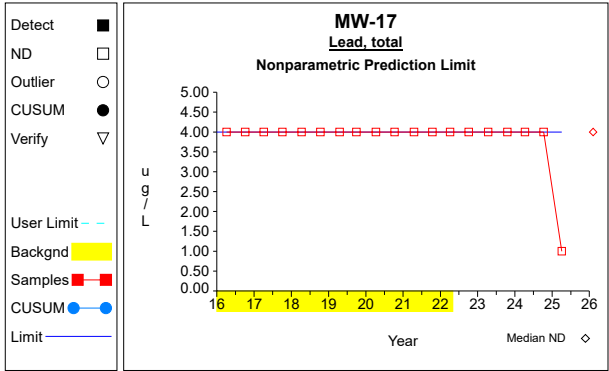
Graph 96



Graph 97

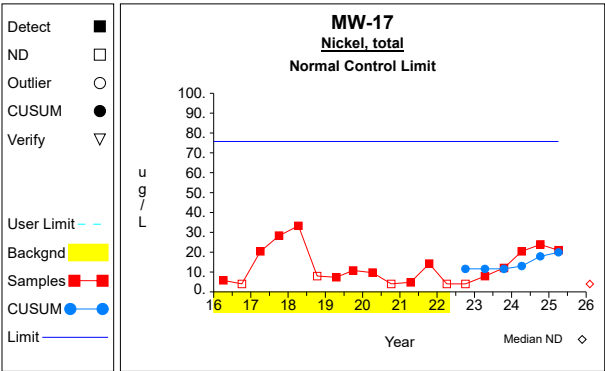


Graph 98

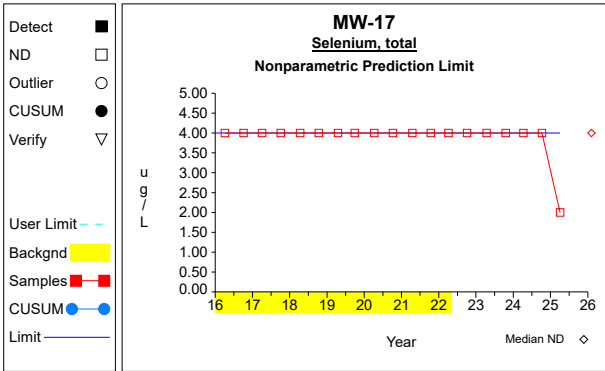


Graph 99

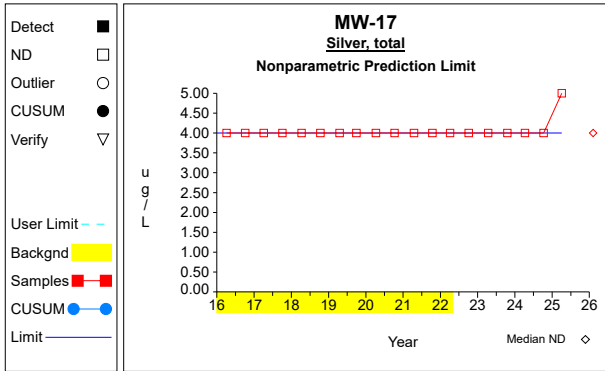
Intra-Well Control Charts / Prediction Limits



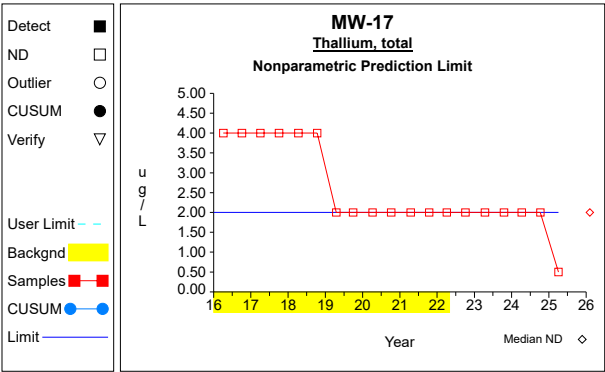
Graph 100



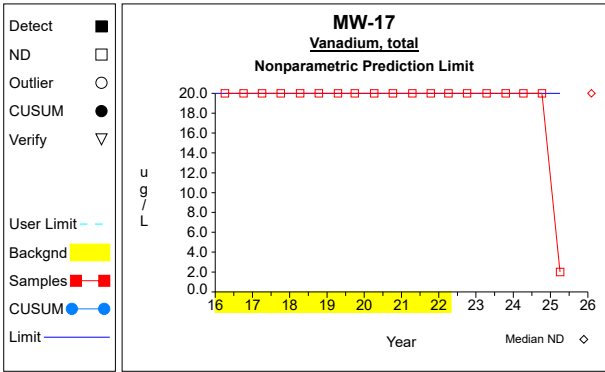
Graph 101



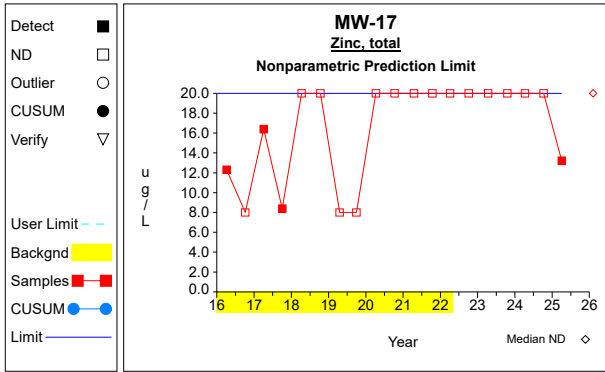
Graph 102



Graph 103

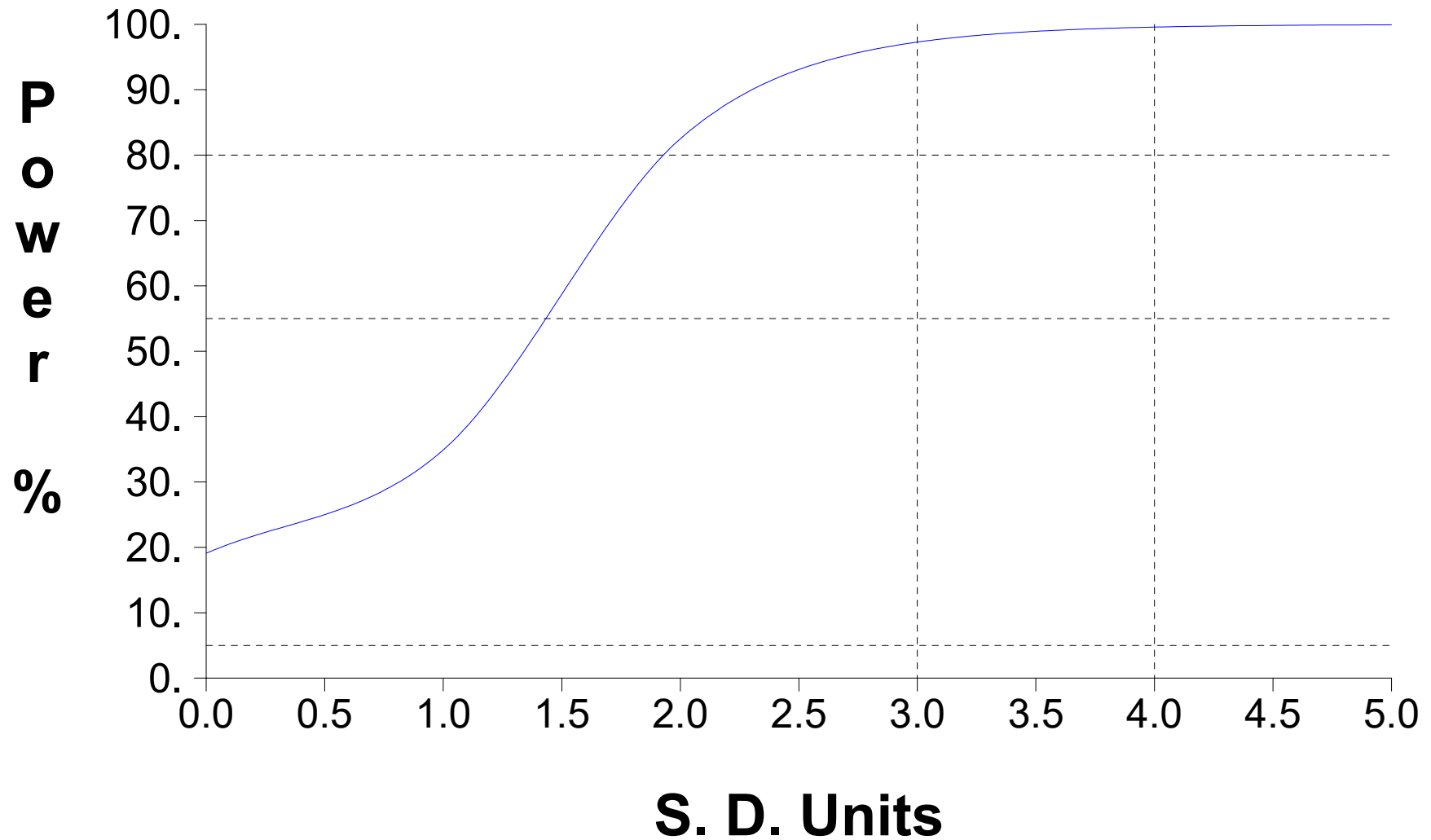


Graph 104



Graph 105

False Positive and False Negative Rates for Current Intra-Well Control Charts Monitoring Program



Attachment F

Assessment Statistics for Trace Metals

Table 1

**Confidence Intervals for Comparing the Mean of the Last
4 Measurements to an Assessment Monitoring Standard**

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	
Arsenic, total	ug/L	MW-12	4	2.000	0.000	1.176	2.000	2.000	10.000	
Barium, total	ug/L	MW-12	4	322.000	27.350	1.176	289.829	354.171	2000.000	
Cobalt, total	ug/L	MW-12	4	1.200	0.115	1.176	1.064	1.336	2.100	
Nickel, total	ug/L	MW-12	4	2.000	0.000	1.176	2.000	2.000	100.000	
Arsenic, total	ug/L	MW-13	4	10.650	3.389	1.176	6.664	14.636	10.000	
Barium, total	ug/L	MW-13	4	596.500	168.469	1.176	398.332	794.668	2000.000	
Cobalt, total	ug/L	MW-13	4	7.175	1.239	1.176	5.717	8.633	2.100	**
Nickel, total	ug/L	MW-13	4	6.600	1.757	1.176	4.533	8.667	100.000	
Arsenic, total	ug/L	MW-14	4	6.200	2.801	1.176	2.905	9.495	10.000	
Barium, total	ug/L	MW-14	4	776.000	78.541	1.176	683.613	868.387	2000.000	
Cobalt, total	ug/L	MW-14	4	0.275	0.150	1.176	0.099	0.451	2.100	
Nickel, total	ug/L	MW-14	4	2.000	0.000	1.176	2.000	2.000	100.000	
Arsenic, total	ug/L	MW-15	4	4.750	5.500	1.176	0.000	11.220	10.000	
Barium, total	ug/L	MW-15	4	335.000	84.857	1.176	235.184	434.816	2000.000	
Cobalt, total	ug/L	MW-15	4	6.750	4.093	1.176	1.936	11.564	2.100	
Nickel, total	ug/L	MW-15	4	10.725	1.658	1.176	8.775	12.675	100.000	
Arsenic, total	ug/L	MW-17	4	2.000	0.000	1.176	2.000	2.000	10.000	
Barium, total	ug/L	MW-17	4	204.500	8.888	1.176	194.045	214.955	2000.000	
Cobalt, total	ug/L	MW-17	4	3.500	3.401	1.176	0.000	7.501	2.100	
Nickel, total	ug/L	MW-17	4	19.350	5.069	1.176	13.387	25.313	100.000	

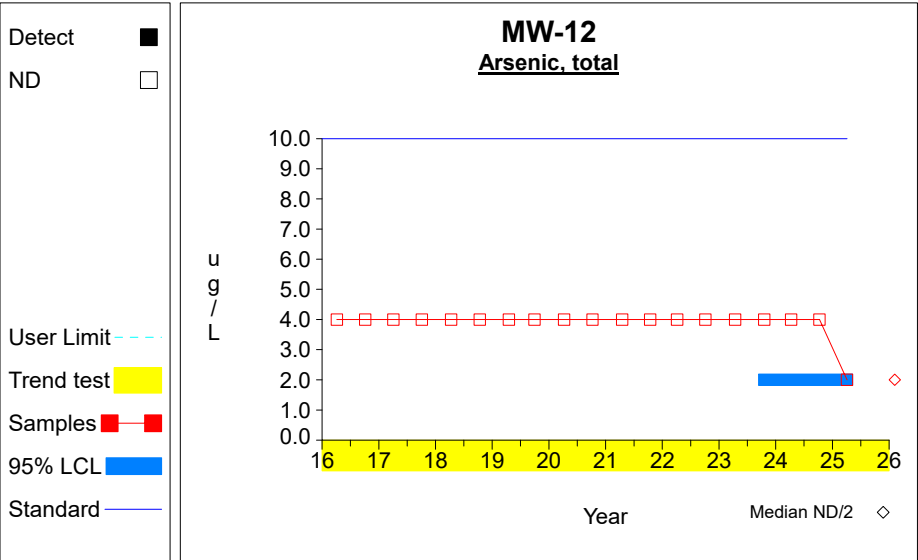
* - Insufficient Data

** - Significant Exceedance

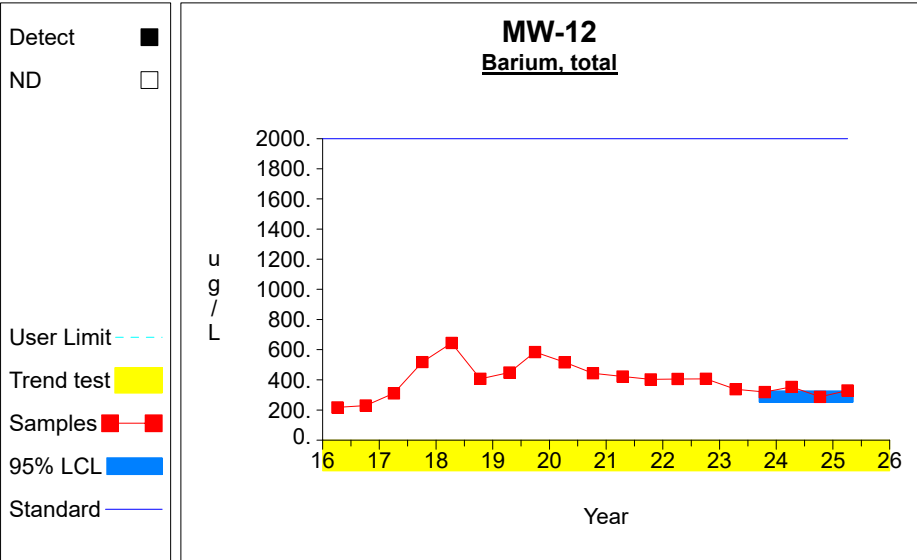
LCL = Lower Confidence Limit

UCL = Upper Confidence Limit

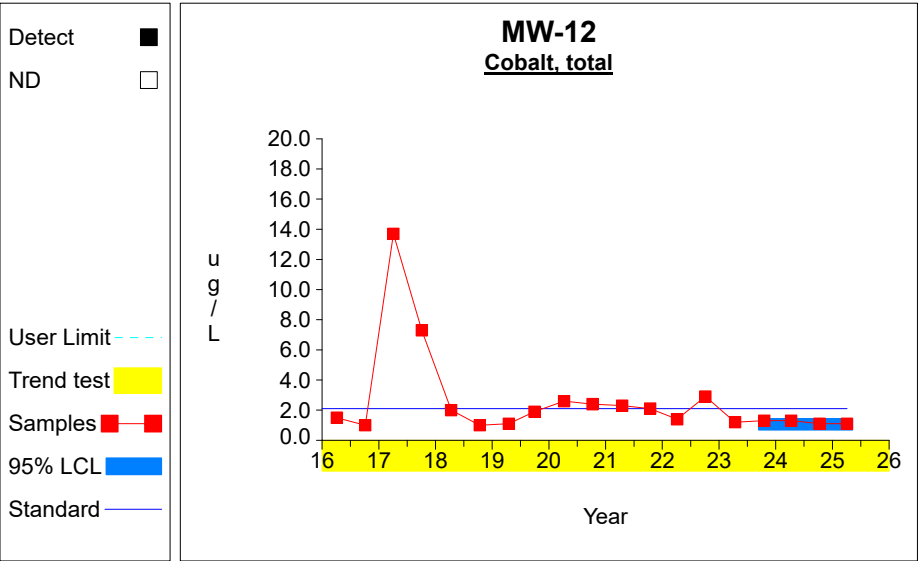
Confidence Limits (Assessment)



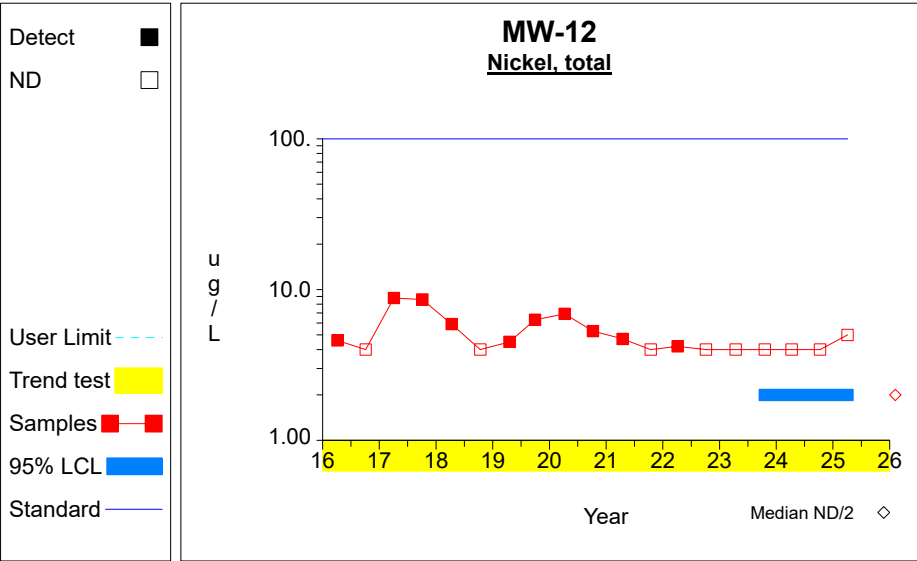
Graph 1



Graph 2

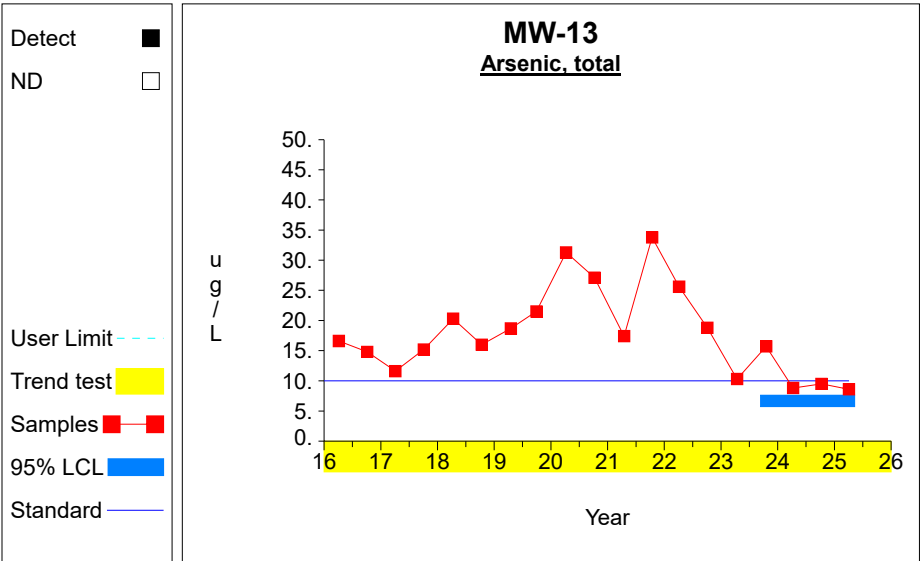


Graph 3

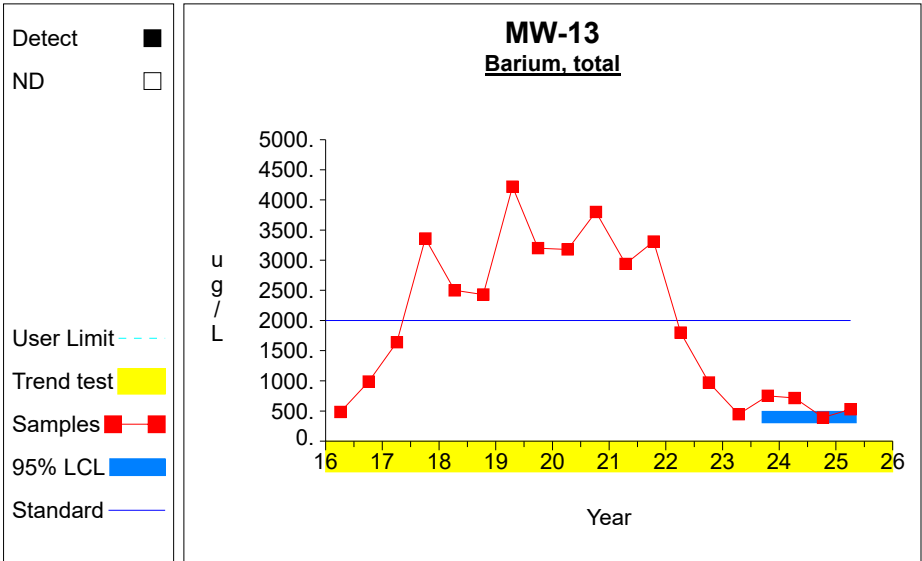


Graph 4

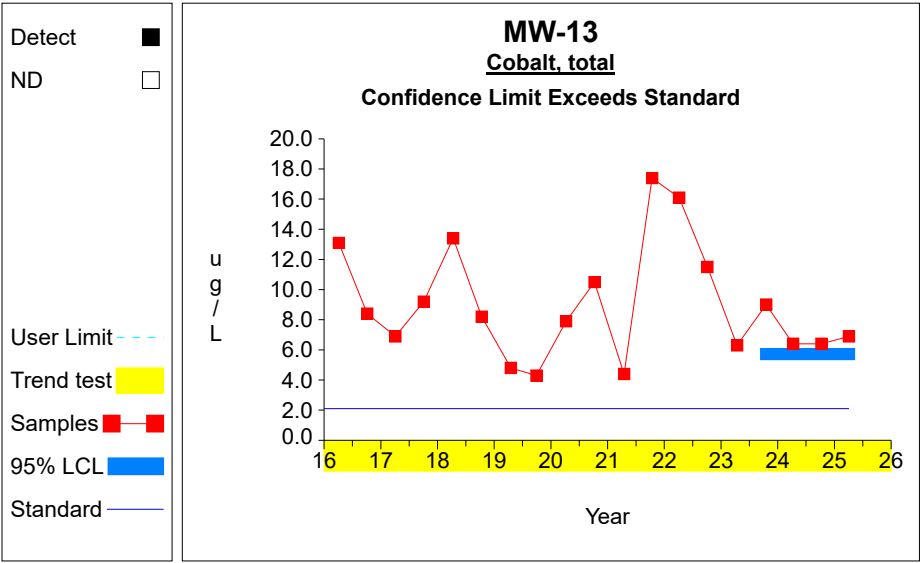
Confidence Limits (Assessment)



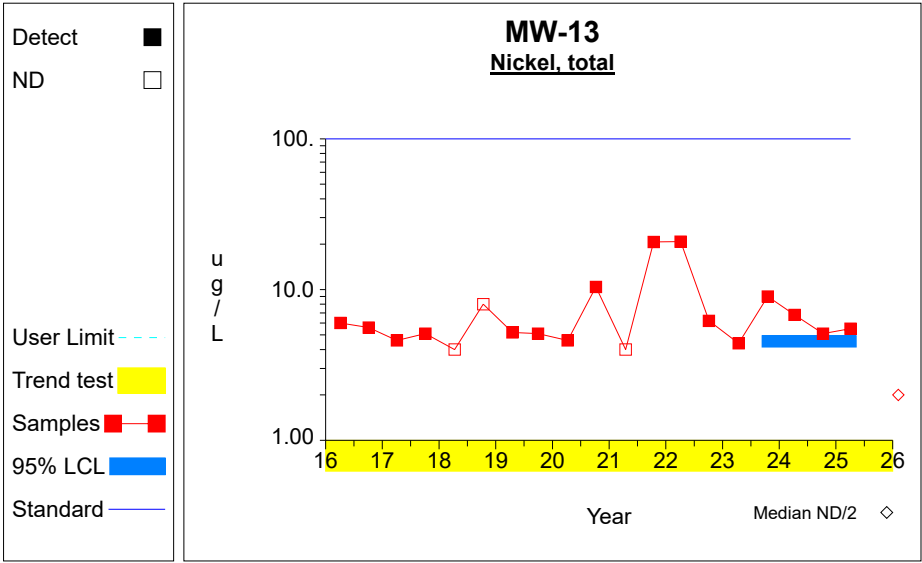
Graph 5



Graph 6

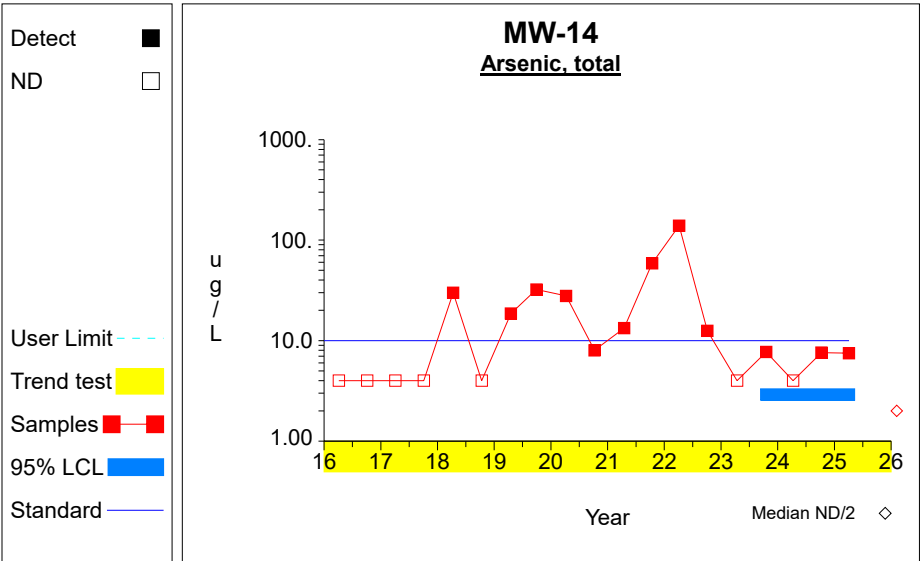


Graph 7

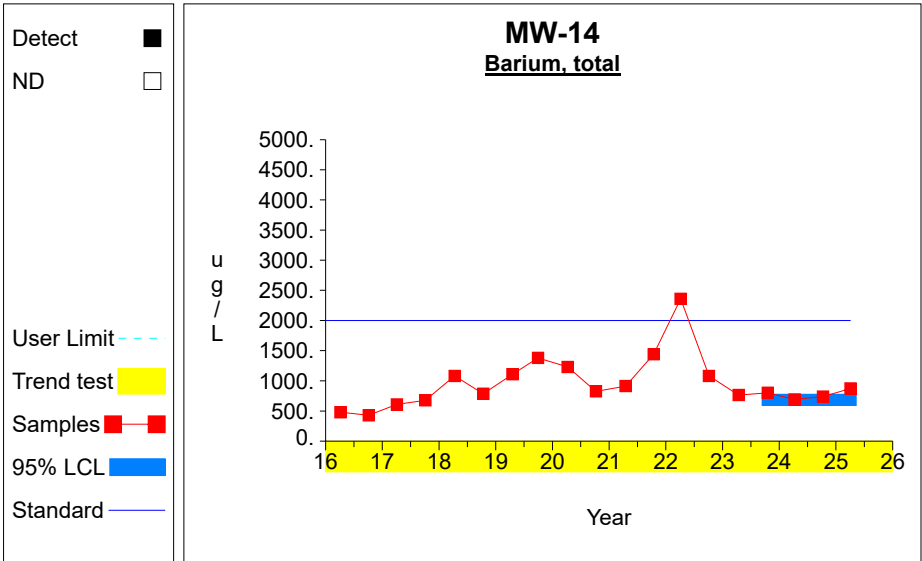


Graph 8

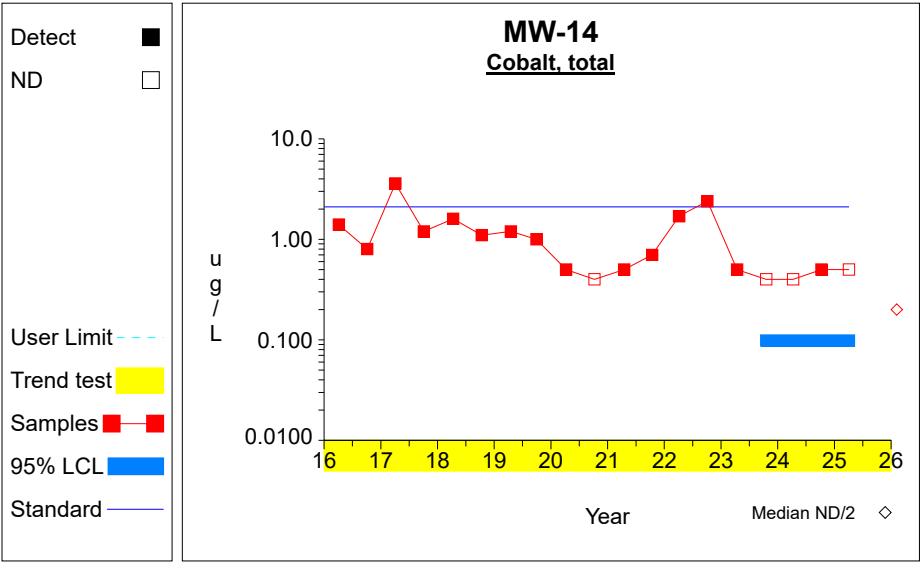
Confidence Limits (Assessment)



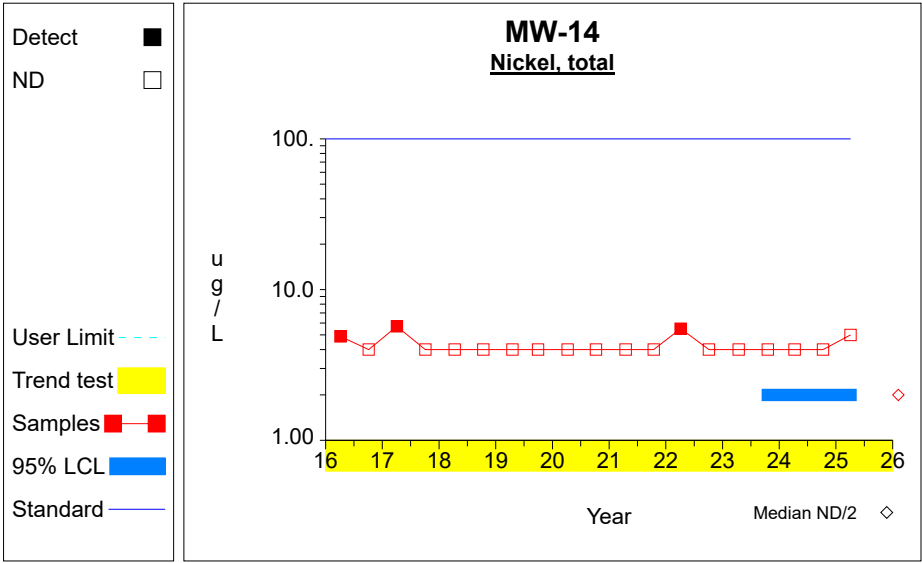
Graph 9



Graph 10

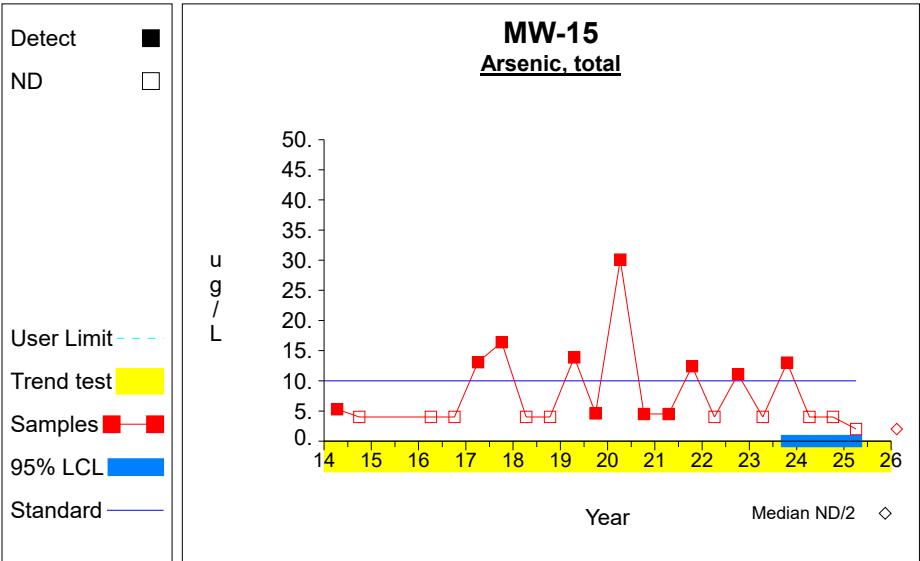


Graph 11

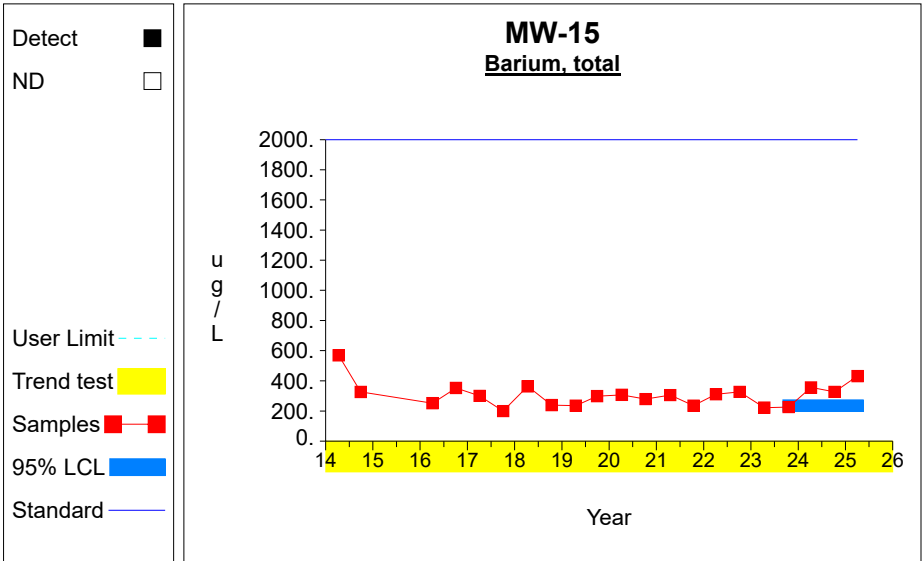


Graph 12

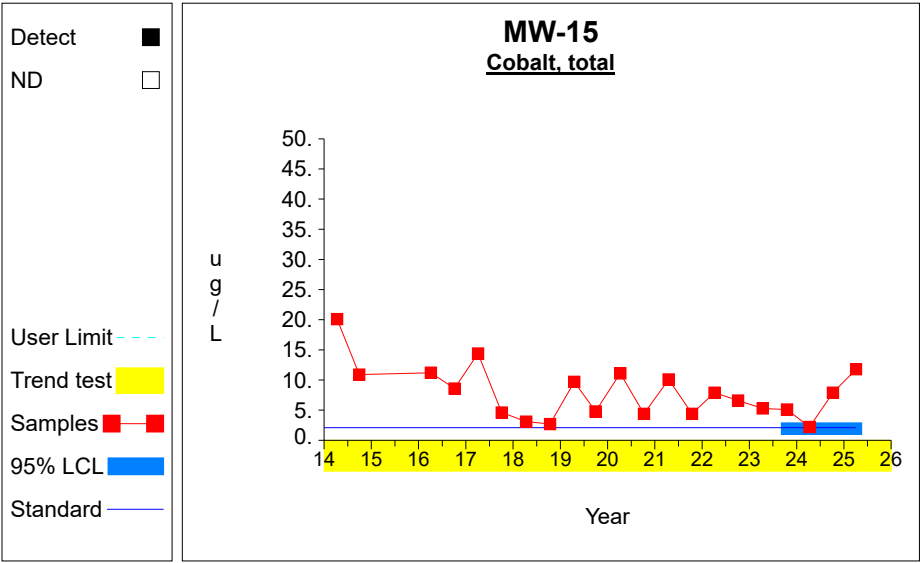
Confidence Limits (Assessment)



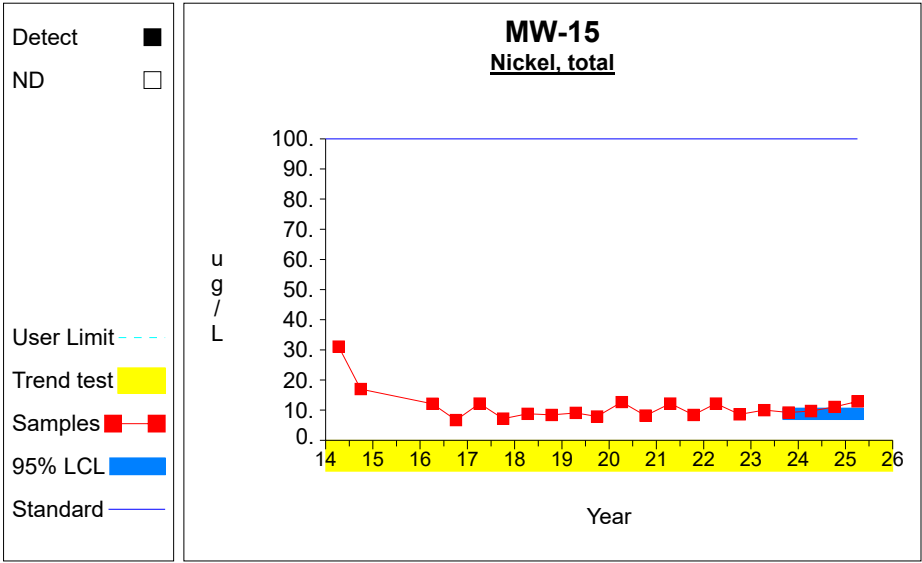
Graph 13



Graph 14

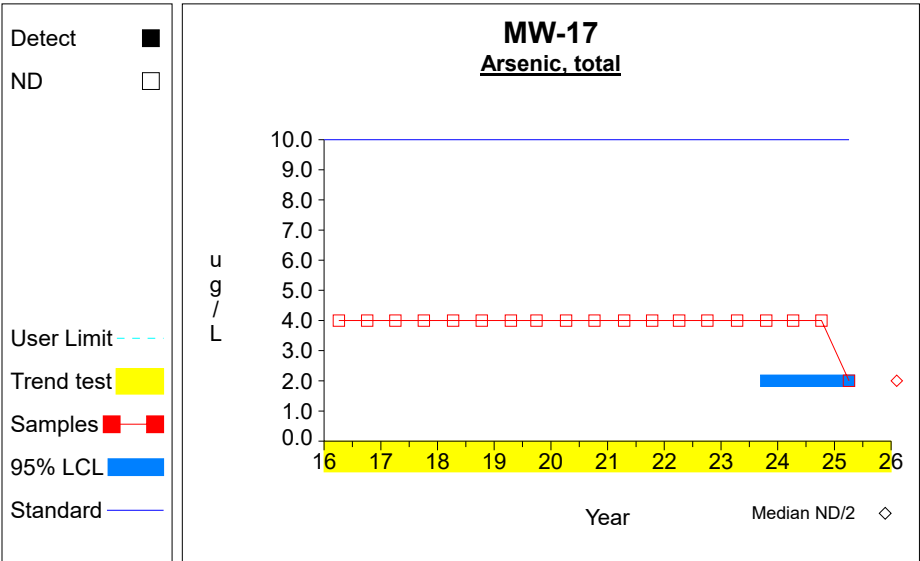


Graph 15

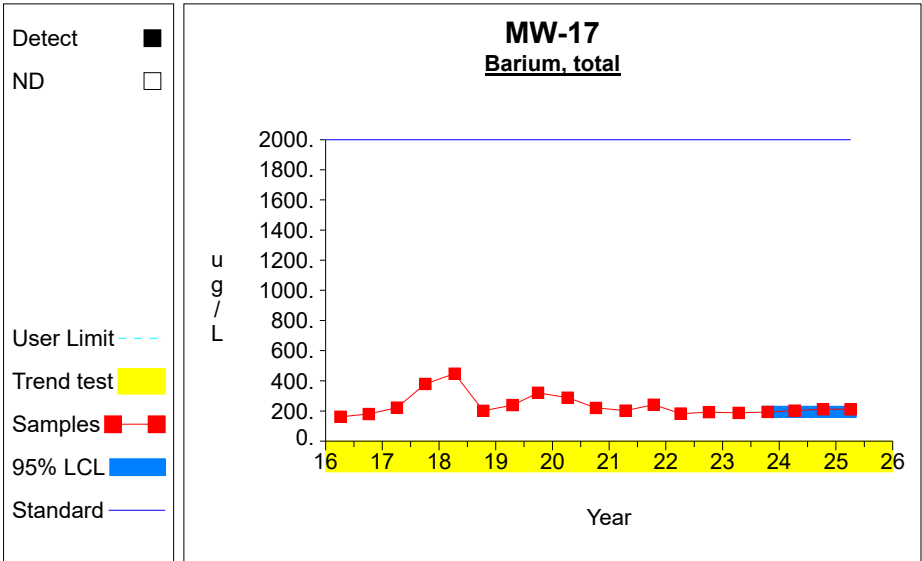


Graph 16

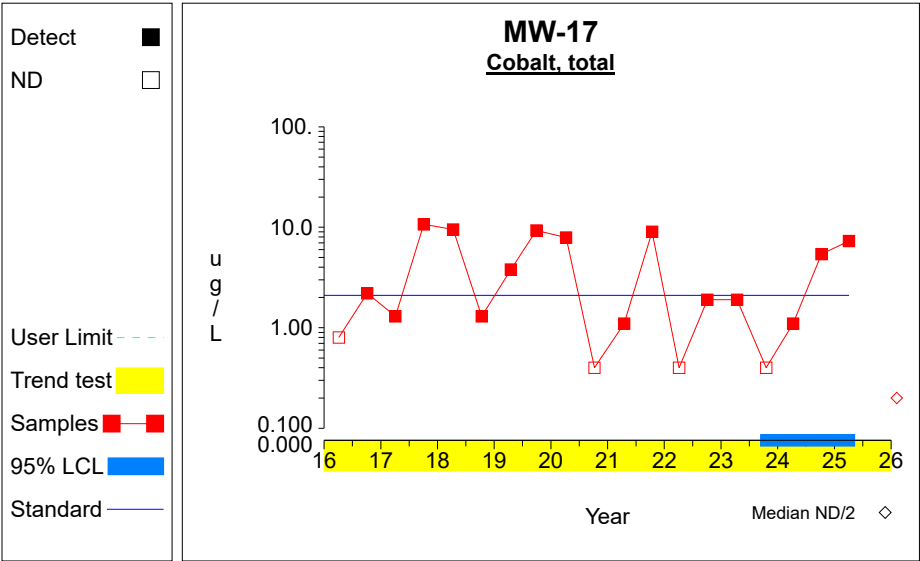
Confidence Limits (Assessment)



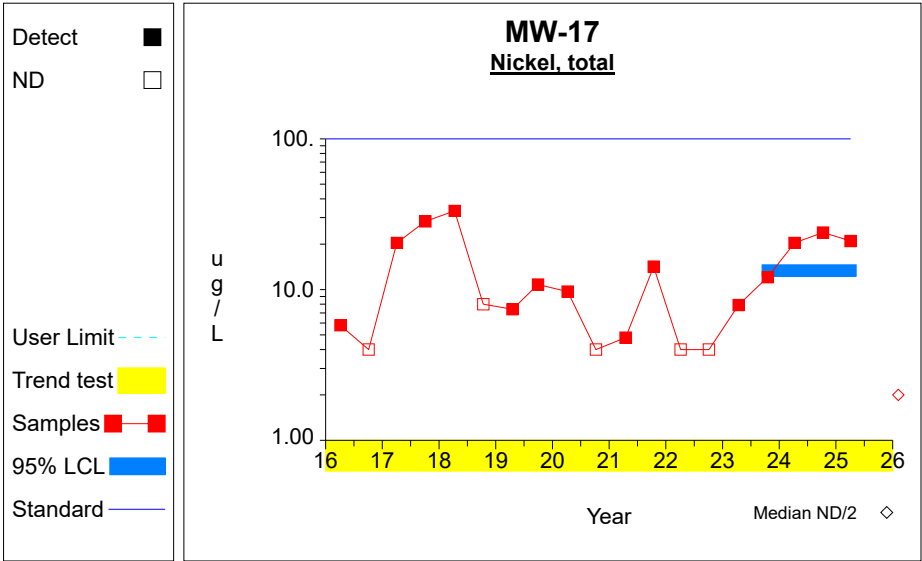
Graph 17



Graph 18



Graph 19



Graph 20

Results of the Ground Water Statistics for Jackson County Sanitary Landfill

Second Semi-Annual Monitoring Event in 2025

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October 2025

INTRODUCTION

This report contains the results of the statistical analyses used to evaluate the ground water data obtained during the second semi-annual monitoring event in 2025 at Jackson County Sanitary Landfill. The ground water at Jackson County Sanitary Landfill is monitored by a network of wells including MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21. Monitoring wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, and MW-17 were sampled on October 14, 2025 and analyzed for the parameters required by permit. At the request of the Iowa DNR, trend analysis and confidence intervals are computed for wells with historical volatile organic compound (VOC) detections.

Ground Water Monitoring Program

The groundwater monitoring network for Jackson County Sanitary Landfill includes MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21. The groundwater monitoring wells is to be sampled and analyzed for the detection monitoring parameters listed in 113.10(5), which includes 15 inorganic constituents and 47 organic compounds, summarized below.

Detection monitoring constituents listed in Appendix I of IAC 567, Chapter 113.

Organic Compounds:

Acetone	<i>trans</i> -1,4-Dichloro-2-butene	Iodomethane
Acrylonitrile	1,1-Dichloroethane	4-Methyl-2-pentanone
Benzene	1,2-Dichloroethane	Styrene
Bromochloromethane	1,1-Dichloroethene	1,1,1,2-Tetrachloroethane
Bromodichloromethane	<i>cis</i> -1,2-Dichloroethene	1,1,2,2-Tetrachloroethane
Bromoform	<i>trans</i> -1,2-Dichloroethene	Tetrachloroethene
Carbon disulfide	1,2-Dichloropropane	Toluene
Carbon tetrachloride	<i>cis</i> -1,3-Dichloropropene	1,1,1-Trichloroethane
Chlorobenzene	<i>trans</i> -1,3-Dichloropropene	1,1,2-Trichloroethane
Chloroethane	Ethylbenzene	Trichloroethene
Chloroform	2-Hexanone	Trichlorofluoromethane
Dibromochloromethane	Bromomethane	1,2,3-Trichloropropane
1,2-Dibromo-3-chloropropane	Chloromethane	Vinyl acetate
1,2-Dibromoethane	Dibromomethane	Vinyl chloride
1,2-Dichlorobenzene	Methylene chloride	Xylenes (Total)
1,4-Dichlorobenzene	2-Butanone	

Inorganic constituents:

Antimony, Total	Chromium, Total	Selenium, Total
Arsenic, Total	Cobalt, Total	Silver, Total
Barium, Total	Copper, Total	Thallium, Total
Beryllium, Total	Lead, Total	Vanadium, Total
Cadmium, Total	Nickel, Total	Zinc, Total

The ground water data obtained during the second semi-annual monitoring event in 2025 are summarized in Attachment A.

STATISTICAL METHODOLOGIES FOR DETECTION MONITORING

IAC 567, Chapter 113.10(4) provides several options for statistically evaluating the ground water data at those wells that monitor the open cells or contiguous MSWLF units. The preferred methods for comparing

ground water data are using either prediction limits or using control charts. The intrawell method using combined Shewhart-CUSUM control charts was applied to the Jackson County Landfill trace metals data using the DUMPStat® statistical program. DUMPStat® is a program for the statistical analysis of groundwater monitoring data using methods described in “Statistical Methods for Groundwater Monitoring” by Dr. Robert D. Gibbons. The DUMPStat program is completely consistent with all USEPA regulations and guidance and the ASTM D6312-98 guidance. The wells impacted with VOCs are evaluated with confidence intervals using the DUMPStat statistical program.

Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are generally man-made compounds not present in ambient ground water. If VOCs are detected above their statistical limit (i.e., the laboratory PQL or reporting limit), a verification resample will be conducted at the next scheduled sampling event. A statistical exceedance will be indicated if the VOC detection is confirmed by the subsequent monitoring.

VOCs detected in the ground water at Jackson County Sanitary Landfill during the second semi-annual monitoring event in 2025 are summarized below.

VOCs detected during the second semi-annual monitoring period in 2025

Well	VOC Detected	Result, µg/L	Reporting Limit, µg/L	Verified/ Awaiting verification	Water Quality Standard
MW-11	Carbon disulfide	1.1	1	Awaiting verification	700 ^b
	Tetrachloroethene	2.1	1	Verified	5 ^a
	Trichloroethene	1.1	1	Awaiting verification	5 ^a
MW-12	Trichloroethene	3.1	1	Verified	5 ^a
MW-17	Carbon disulfide	1.0	1	Awaiting verification	700 ^b
	Tetrachloroethene	1.3	1	Verified	5 ^a

a - USEPA MCL

b- Iowa Statewide Standard for a protected groundwater source

Historical VOC detections are summarized in Attachment B.

The verified VOC detections were evaluated against the ground water protection standards (GWPS) using confidence limits calculated in accordance with the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, March 2009. The analysis was conducted to evaluate whether verified concentrations are significantly above the water quality standard. The 95% lower confidence limit (LCL) for the mean of the historical data was used to evaluate whether the regulated unit is in compliance with the ground-water protection standards under 40 CFR 264 (e.g. whether the verified constituent is detected at a significant level above the GWPS). An exceedance is verified if the LCL is above the Regulatory GWPS.

The calculated 95% LCLs for each of the verified VOCs are below the respective GWPS (Attachment C). No increasing trends were detected.

Trace Metals

The historical Appendix I trace metals data obtained from monitoring wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, and MW-21 are plotted in Attachment D. No increasing trends were detected in the historical data. Decreasing trends were detected in the historical data for arsenic at MW-19 and arsenic, cobalt, and nickel at MW-20.

Intrawell statistics

Intrawell statistics are appropriate for facilities where the upgradient wells do not accurately characterize the natural ground water conditions downgradient from the facility. This may be due to different hydrogeological conditions where the wells are screened, having too few upgradient wells to account for the spatial variability, or the site exhibiting no definable hydraulic gradient. Intrawell statistics compare new measurements to the historical data at each ground water monitoring well independently. It is recommended that at least eight background samples be obtained prior to performing the statistics.

The most useful technique for intrawell comparisons is the combined Shewhart-CUSUM control chart. This control chart procedure is useful because it will detect releases both in terms of the constituent concentration and cumulative increases. This method is also extremely sensitive to sudden and gradual releases. A requirement for constructing these control charts is that the parameter is detected at a frequency greater than or equal to 25%, otherwise the data variance is not properly defined.

The combined Shewhart-CUSUM control chart assumes that the data are independent and normally distributed with a fixed mean and a constant variance. Independent data is much more critical than the normality assumption. To achieve independence, it is recommended that data are collected no more frequently than quarterly to account for seasonal variation. The combined Shewhart-CUSUM control chart is extremely robust to deviations from normality. Because the control charts do not use a specific multiplier based on a normal distribution, it is more conservative to assume normality.

It is recommended that at least eight rounds of data be available to provide a reliable estimate of the mean and standard deviation of the parameter concentration, although the control charts will be generated with as few as four data points. Having only four data points may produce greater uncertainty in the mean and standard deviation of the background data, leading to higher control limits, thus having a potentially high false negative rate.

Many groundwater monitoring parameters are not detected at a frequency great enough to generate the combined Shewhart-CUSUM control charts. For constituents that are detected less than 25% of the time at a particular well, the data should be plotted as a time series until a sufficient number of data points are available to provide a 99% confidence nonparametric prediction limit. Thirteen independent measurements (with 1 resample) are necessary to achieve a 99% confidence (1% false positive rate) nonparametric prediction limit. Eight independent measurements (for pass 1 of 2 resamples) are necessary to achieve a 99% confidence nonparametric prediction limit. The nonparametric prediction limit is the largest determination out of the data set collected for that well and parameter. If the detection frequency is 0% after thirteen samples have been collected, the practical quantitation limit (PQL) becomes the nonparametric prediction limit.

In developing the statistical background, the historical data must be thoroughly screened for anomalous data due to sampling error, analytical error, or simply by chance alone. An erroneous data point, if not removed prior to the mean and variance computations, would yield a larger control limit thus increasing the false negative rate. The DUMPStat® program screens for outliers using the Dixon test. Anomalous data will still be plotted on the graphs (with a unique symbol) but will not be included in the calculations.

The verification resample plan is an integral function of the statistical plan to reduce the probability that anomalous data obtained after the background has been established, is indicative of a landfill release.

The background data for each well and constituent is tested for existing trends using Sen's nonparametric estimate of trend. If contamination exists prior to completing the background, the control limits could be potentially high and this control chart method would not be able to detect an increasing trend unless the increase is severe.

Results of the Intrawell Statistics

The Appendix I trace metals data from wells MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, and MW-17 were evaluated using the combined Shewhart-CUSUM control chart method. The previous background included the data obtained from 2014 through April 2022. As ground water monitoring at a municipal solid waste facility proceeds, it is recommended to update background data sets periodically with valid detection monitoring results that are representative of background groundwater quality not affected by leakage from a monitored unit. Failure to update background will exclude factors such as natural temporal variation, changes in field or laboratory methodologies, and changes in the water table due to meteorological conditions or other influences. Since there have been no statistical failures attributed to the landfill, the background was updated to include data obtained from 2014 through April 2025.

A summary of the intrawell statistics is included in Attachment E, Table 1 “Summary Statistics and Intermediate Computations for Combined Shewhart-CUSUM Control Charts.” The control charts or time series graphs follow the summary table. For the parameters compared to background, the control limit exceedances detected are summarized in the table below.

Trace Metal Control Limit Exceedances During the Second Semi-Annual Monitoring Event in 2025

Well	Trace Metal Detected	Result, µg/L	Prediction Limit, µg/L	Prediction Limit Type	Verified/ Awaiting Verification
MW-12	Copper	11.8	4.0000	Nonparametric	Awaiting verification
	Zinc	24.4	20.0000	Nonparametric	Awaiting verification

A control chart factor was selected to provide a balance of the site-wide false positive and false negative rates. A statistical power curve indicates the expected false assessments for the site as a whole. For intrawell analysis, the site-wide false positive rate is 12% and the test becomes sensitive to 3 standard deviation units over background.

The past and current verified trace metal exceedances were evaluated against the GWPS using confidence limits. The 95% LCL for cobalt at MW-13 (5.975 µg/L) exceeds the GWPS of 2.1 µg/L. The 95% LCL

for cobalt at MW-15 (2.779 µg/L) exceeds the GWPS of 2.1 µg/L. The calculated 95% LCL for each of the remaining trace metal exceedances are below the respective GWPS (Attachment F).

Attachment A

Ground Water Data obtained during the Second Semi-Annual Monitoring Event in 2025

Table 1

Analytical Data Summary for 10/14/2025

Constituents	Units	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-17
1,1,1,2-tetrachloroethane	ug/L		<1	<1				<1
1,1,1-trichloroethane	ug/L		<1	<1				<1
1,1,2,2-tetrachloroethane	ug/L		<1	<1				<1
1,1,2-trichloroethane	ug/L		<1	<1				<1
1,1-dichloroethane	ug/L		<1	<1				<1
1,1-dichloroethene	ug/L		<1	<1				<1
1,2,3-trichloropropane	ug/L		<1	<1				<1
1,2-dibromo-3-chloropropane	ug/L		<5	<5				<5
1,2-dibromoethane	ug/L		<1	<1				<1
1,2-dichlorobenzene	ug/L		<1	<1				<1
1,2-dichloroethane	ug/L		<1	<1				<1
1,2-dichloropropane	ug/L		<1	<1				<1
1,4-dichlorobenzene	ug/L		<1	<1				<1
2-butanone	ug/L		<10	<10				<10
2-hexanone	ug/L		<5	<5				<5
4-methyl-2-pentanone	ug/L		<5	<5				<5
Acetone	ug/L		<10	<10				<10
Acrylonitrile	ug/L		<5	<5				<5
Antimony, total	ug/L	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0
Arsenic, total	ug/L	<2.0	<2.0	<2.0	10.2	5.0	<2.0	<2.0
Barium, total	ug/L	90.7	104.0	330.0	562.0	849.0	338.0	221.0
Benzene	ug/L		<1	<1				<1
Beryllium, total	ug/L	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Bromochloromethane	ug/L		<1	<1				<1
Bromodichloromethane	ug/L		<1	<1				<1
Bromoform	ug/L		<1	<1				<1
Bromomethane	ug/L		<1	<1				<1
Cadmium, total	ug/L	<.2	<.2	<.2	<.2	<.2	<.2	.2
Carbon disulfide	ug/L		1.1	<1.0				1.0
Carbon tetrachloride	ug/L		<1	<1				<1
Chlorobenzene	ug/L		<1	<1				<1
Chloroethane	ug/L		<1	<1				<1
Chloroform	ug/L		<1	<1				<1
Chloromethane	ug/L		<1	<1				<1
Chromium, total	ug/L	<1.0	<1.0	1.0	<1.0	1.1	<1.0	1.0
Cis-1,2-dichloroethene	ug/L		<1	<1				<1
Cis-1,3-dichloropropene	ug/L		<1	<1				<1
Cobalt, total	ug/L	<.5	<.5	1.1	8.2	.5	7.8	14.6
Copper, total	ug/L	<5.0	<5.0	11.8	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L		<1	<1				<1
Dibromomethane	ug/L		<1	<1				<1
Ethylbenzene	ug/L		<1	<1				<1
Lead, total	ug/L	<1.0	<1.0	2.6	<1.0	<1.0	<1.0	<1.0
Methyl iodide	ug/L		<1	<1				<1
Methylene chloride	ug/L		<5	<5				<5
Nickel, total	ug/L	<5.0	<5.0	<5.0	5.5	<5.0	11.0	19.3
Selenium, total	ug/L	<2	<2	<2	<2	<2	<2	<2
Silver, total	ug/L	<5	<5	<5	<5	<5	<5	<5
Styrene	ug/L		<1	<1				<1
Tetrachloroethene	ug/L		2.1	<1.0				1.3
Thallium, total	ug/L	<.5	<.5	<.5	<.5	<.5	<.5	<.5
Toluene	ug/L		<1	<1				<1
Trans-1,2-dichloroethene	ug/L		<1	<1				<1
Trans-1,3-dichloropropene	ug/L		<1	<1				<1
Trans-1,4-dichloro-2-butene	ug/L		<5	<5				<5
Trichloroethene	ug/L		1.1	3.1				<1.0
Trichlorofluoromethane	ug/L		<1	<1				<1
Vanadium, total	ug/L	<2	<2	<2	<2	<2	<2	<2
Vinyl acetate	ug/L		<5	<5				<5
Vinyl chloride	ug/L		<1	<1				<1
Xylenes, total	ug/L		<2	<2				<2
Zinc, total	ug/L	<5.0	10.8	24.4	5.0	9.0	<5.0	12.5

* - The displayed value is the arithmetic mean of multiple database matches.

Attachment B

Historical VOC Detections

Table 1

Historical Volatile Organic Compound Detections

Constituent	Well	Date	Identifier	Result	Limit	Units
Carbon disulfide	MW-11	10/14/2025		1.1	1.0	ug/L
Tetrachloroethene	MW-11	10/04/2016		1.4	1.0	ug/L
Tetrachloroethene	MW-11	10/03/2017		2.3	1.0	ug/L
Tetrachloroethene	MW-11	10/12/2018		3.1	1.0	ug/L
Tetrachloroethene	MW-11	9/30/2019		2.0	1.0	ug/L
Tetrachloroethene	MW-11	4/16/2021		1.4	1.0	ug/L
Tetrachloroethene	MW-11	10/14/2021		1.4	1.0	ug/L
Tetrachloroethene	MW-11	4/13/2023		2.0	1.0	ug/L
Tetrachloroethene	MW-11	10/18/2023		1.3	1.0	ug/L
Tetrachloroethene	MW-11	10/08/2024		1.1	1.0	ug/L
Tetrachloroethene	MW-11	4/03/2025		2.0	1.0	ug/L
Tetrachloroethene	MW-11	10/14/2025		2.1	1.0	ug/L
Trichloroethene	MW-11	10/14/2025		1.1	1.0	ug/L
Acetone	MW-12	10/03/2017		15.4	10.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/04/2016		1.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	10/04/2016		1.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/03/2017		1.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	10/12/2018		2.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	4/17/2019		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-12	9/30/2019		1.1	1.0	ug/L
Tetrachloroethene	MW-12	4/08/2024		1.8	1.0	ug/L
Trichloroethene	MW-12	4/04/2016		5.0	1.0	ug/L
Trichloroethene	MW-12	10/04/2016		3.8	1.0	ug/L
Trichloroethene	MW-12	4/03/2017		4.5	1.0	ug/L
Trichloroethene	MW-12	10/03/2017		5.6	1.0	ug/L
Trichloroethene	MW-12	4/10/2018		4.9	1.0	ug/L
Trichloroethene	MW-12	10/12/2018		5.1	1.0	ug/L
Trichloroethene	MW-12	4/17/2019		3.9	1.0	ug/L
Trichloroethene	MW-12	9/30/2019		2.4	1.0	ug/L
Trichloroethene	MW-12	4/07/2020		3.5	1.0	ug/L
Trichloroethene	MW-12	10/07/2020		2.6	1.0	ug/L
Trichloroethene	MW-12	4/16/2021		2.7	1.0	ug/L
Trichloroethene	MW-12	10/14/2021		2.2	1.0	ug/L
Trichloroethene	MW-12	4/04/2022		2.5	1.0	ug/L
Trichloroethene	MW-12	10/04/2022		3.0	1.0	ug/L
Trichloroethene	MW-12	4/13/2023		2.2	1.0	ug/L
Trichloroethene	MW-12	10/18/2023		2.1	1.0	ug/L
Trichloroethene	MW-12	10/08/2024		2.2	1.0	ug/L
Trichloroethene	MW-12	4/03/2025		1.8	1.0	ug/L
Trichloroethene	MW-12	10/14/2025		3.1	1.0	ug/L
Carbon disulfide	MW-17	10/14/2025		1	1	ug/L
Cis-1,2-dichloroethene	MW-17	10/03/2017		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-17	10/12/2018		3.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-17	9/30/2019		1.1	1.0	ug/L
Tetrachloroethene	MW-17	4/04/2016		1.1	1.0	ug/L
Tetrachloroethene	MW-17	10/04/2016		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/03/2017		1.6	1.0	ug/L
Tetrachloroethene	MW-17	10/03/2017		1.7	1.0	ug/L
Tetrachloroethene	MW-17	10/12/2018		2.3	1.0	ug/L
Tetrachloroethene	MW-17	4/17/2019		1.2	1.0	ug/L
Tetrachloroethene	MW-17	9/30/2019		1.0	1.0	ug/L
Tetrachloroethene	MW-17	4/07/2020		1.4	1.0	ug/L
Tetrachloroethene	MW-17	4/16/2021		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/04/2022		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/13/2023		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/08/2024		1.2	1.0	ug/L
Tetrachloroethene	MW-17	4/03/2025		1.2	1.0	ug/L
Tetrachloroethene	MW-17	10/14/2025		1.3	1.0	ug/L
1,1-dichloroethane	MW-19	10/04/2016		3.2	1.0	ug/L
1,1-dichloroethane	MW-19	4/03/2017		6.3	1.0	ug/L
1,1-dichloroethane	MW-19	10/03/2017		3.1	1.0	ug/L
1,1-dichloroethane	MW-19	4/10/2018		3.6	1.0	ug/L
1,1-dichloroethane	MW-19	10/12/2018		4.2	1.0	ug/L
1,1-dichloroethane	MW-19	4/17/2019		5.2	1.0	ug/L
1,1-dichloroethane	MW-19	9/30/2019		6.4	1.0	ug/L
1,1-dichloroethane	MW-19	4/07/2020		5.4	1.0	ug/L
1,1-dichloroethane	MW-19	10/07/2020		9.3	1.0	ug/L
1,1-dichloroethane	MW-19	4/16/2021		3.7	1.0	ug/L
1,1-dichloroethane	MW-19	10/14/2021		3.8	1.0	ug/L
1,1-dichloroethane	MW-19	4/04/2022		1.3	1.0	ug/L
1,1-dichloroethane	MW-19	10/04/2022		2.4	1.0	ug/L
Acetone	MW-19	10/04/2016		19.0	10.0	ug/L
Acetone	MW-19	4/03/2017		49.6	10.0	ug/L
Acetone	MW-19	10/12/2018		13.0	10.0	ug/L
Acetone	MW-19	4/04/2022		35.2	10.0	ug/L
Acetone	MW-19	10/04/2022		17.0	10.0	ug/L

Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

Table 1

Historical Volatile Organic Compound Detections

Constituent	Well	Date	Identifier	Result	Limit	Units
Benzene	MW-19	3/17/2009		1.2	1.0	ug/L
Benzene	MW-19	10/04/2016		1.1	1.0	ug/L
Benzene	MW-19	4/17/2019		1.1	1.0	ug/L
Benzene	MW-19	4/07/2020		1.5	1.0	ug/L
Benzene	MW-19	10/07/2020		3.1	1.0	ug/L
Benzene	MW-19	4/16/2021		1.7	1.0	ug/L
Chloroethane	MW-19	10/04/2016		3.2	1.0	ug/L
Chloroethane	MW-19	4/03/2017		2.4	1.0	ug/L
Chloroethane	MW-19	10/03/2017		2.2	1.0	ug/L
Chloroethane	MW-19	4/10/2018		3.5	1.0	ug/L
Chloroethane	MW-19	10/12/2018		2.7	1.0	ug/L
Chloroethane	MW-19	4/17/2019		2.8	1.0	ug/L
Chloroethane	MW-19	9/30/2019		3.2	1.0	ug/L
Chloroethane	MW-19	4/07/2020		2.6	1.0	ug/L
Chloroethane	MW-19	10/07/2020		4.0	1.0	ug/L
Chloroethane	MW-19	4/16/2021		2.1	1.0	ug/L
Chloroethane	MW-19	10/14/2021		2.0	1.0	ug/L
Chloroethane	MW-19	10/04/2022		1.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/04/2016		23.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/03/2017		4.5	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/03/2017		36.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/10/2018		46.2	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/12/2018		34.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/17/2019		43.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	9/30/2019		39.9	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/07/2020		54.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/07/2020		98.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/16/2021		23.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/14/2021		26.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/04/2022		6.6	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	10/04/2022		7.6	1.0	ug/L
Cis-1,2-dichloroethene	MW-19	4/13/2023		1.8	1.0	ug/L
Tetrachloroethene	MW-19	10/04/2016		6.6	1.0	ug/L
Tetrachloroethene	MW-19	4/03/2017		43.2	1.0	ug/L
Tetrachloroethene	MW-19	10/12/2018		2.8	1.0	ug/L
Tetrachloroethene	MW-19	4/17/2019		1.9	1.0	ug/L
Tetrachloroethene	MW-19	10/14/2021		1.0	1.0	ug/L
Trichloroethene	MW-19	3/17/2009		8.5	1.0	ug/L
Trichloroethene	MW-19	10/04/2016		2.8	1.0	ug/L
Trichloroethene	MW-19	4/03/2017		7.9	1.0	ug/L
Trichloroethene	MW-19	10/12/2018		5.1	1.0	ug/L
Trichloroethene	MW-19	4/17/2019		3.9	1.0	ug/L
Trichloroethene	MW-19	9/30/2019		11.8	1.0	ug/L
Trichloroethene	MW-19	4/07/2020		2.2	1.0	ug/L
Trichloroethene	MW-19	10/07/2020		2.0	1.0	ug/L
Trichloroethene	MW-19	4/16/2021		10.6	1.0	ug/L
Trichloroethene	MW-19	10/14/2021		3.6	1.0	ug/L
Trichloroethene	MW-19	4/04/2022		2.1	1.0	ug/L
Trichloroethene	MW-19	10/04/2022		5.1	1.0	ug/L
Trichloroethene	MW-19	4/13/2023		2.3	1.0	ug/L
Vinyl chloride	MW-19	10/07/2020		1.2	1.0	ug/L
Xylenes, total	MW-19	4/17/2019		2.4	2.0	ug/L
Xylenes, total	MW-19	10/07/2020		3.0	2.0	ug/L
Acetone	MW-20	10/04/2016		72.9	10.0	ug/L
Acetone	MW-20	4/03/2017		10.4	10.0	ug/L
Acetone	MW-20	10/03/2017		34.0	10.0	ug/L
Acetone	MW-20	4/10/2018		32.9	10.0	ug/L
Acetone	MW-20	10/12/2018		28.7	10.0	ug/L
Acetone	MW-20	4/17/2019		27.2	10.0	ug/L
Acetone	MW-20	10/14/2021		180.0	10.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/04/2016		1.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/03/2017		1.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/12/2018		6.0	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/17/2019		3.8	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	9/30/2019		3.7	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/07/2020		3.4	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/07/2020		9.1	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	4/16/2021		4.5	1.0	ug/L
Cis-1,2-dichloroethene	MW-20	10/14/2021		3.9	1.0	ug/L
Tetrachloroethene	MW-20	10/03/2017		1.7	1.0	ug/L
Toluene	MW-20	10/04/2016		6.7	1.0	ug/L
Toluene	MW-20	4/03/2017		1.3	1.0	ug/L
Trichloroethene	MW-20	3/17/2009		1.6	1.0	ug/L
Trichloroethene	MW-20	10/03/2017		2.2	1.0	ug/L
Trichloroethene	MW-20	10/12/2018		3.1	1.0	ug/L
Trichloroethene	MW-20	4/17/2019		1.7	1.0	ug/L

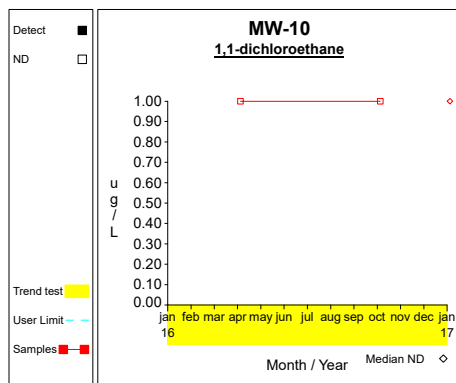
Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

Table 1**Historical Volatile Organic Compound Detections**

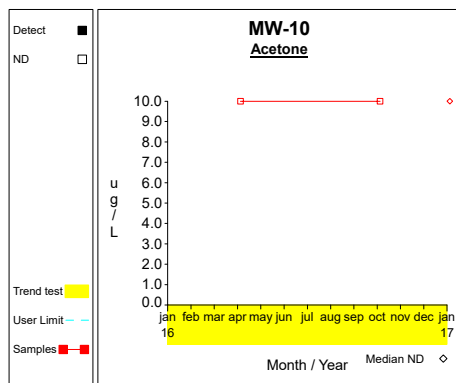
Constituent	Well	Date	Identifier	Result	Limit	Units
Trichloroethene	MW-20	4/07/2020		1.1	1.0	ug/L

Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

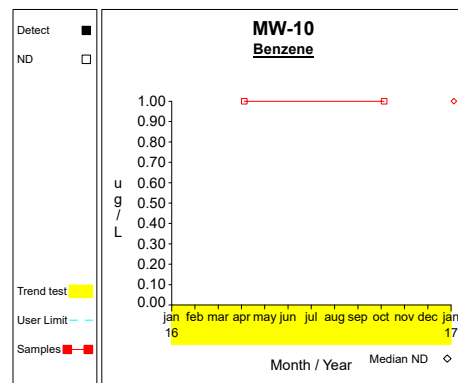
Time Series



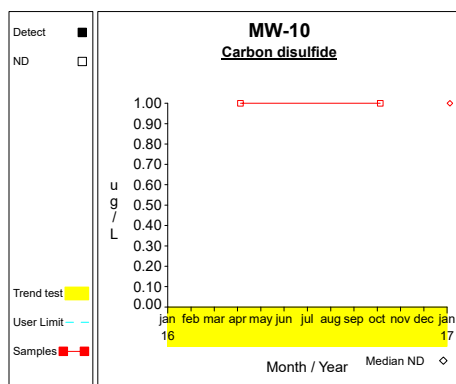
Graph 1



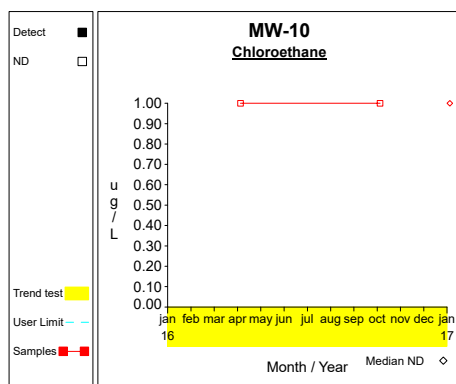
Graph 2



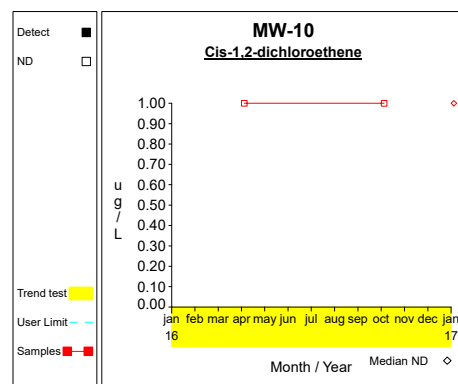
Graph 3



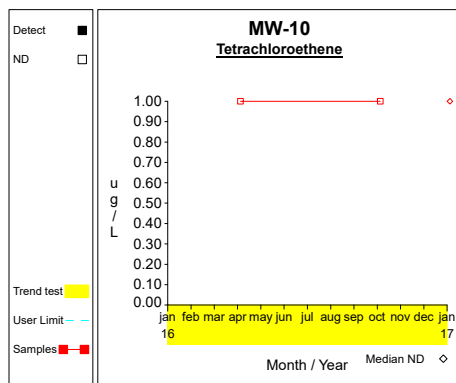
Graph 4



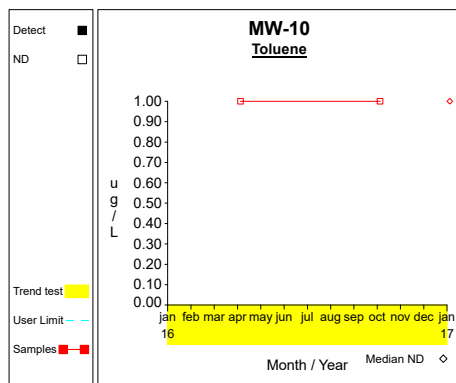
Graph 5



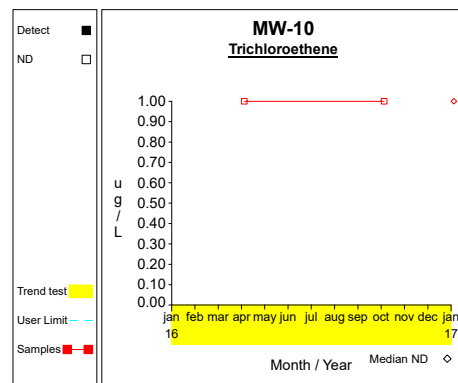
Graph 6



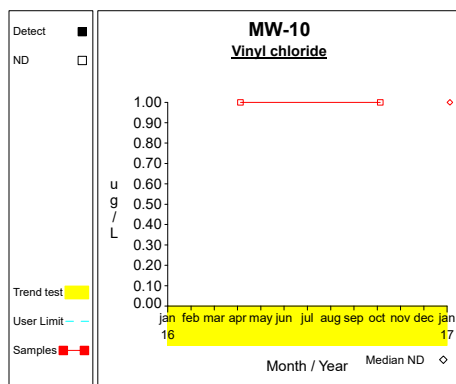
Graph 7



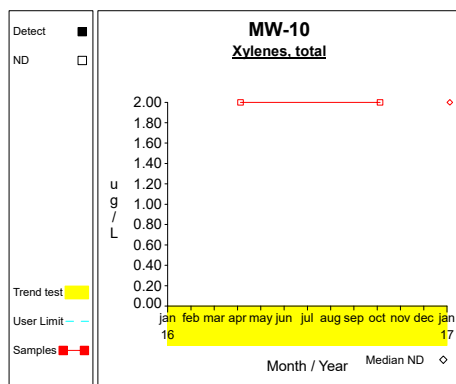
Graph 8



Graph 9

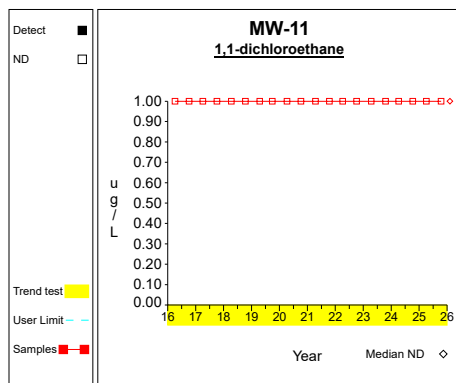


Graph 10

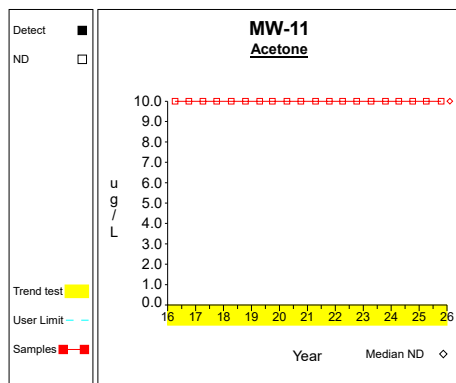


Graph 11

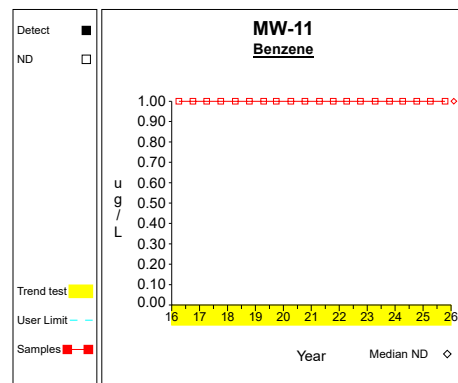
Time Series



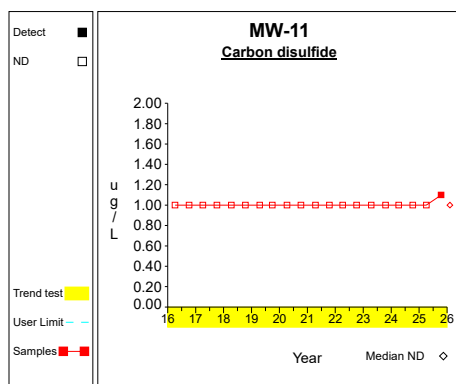
Graph 12



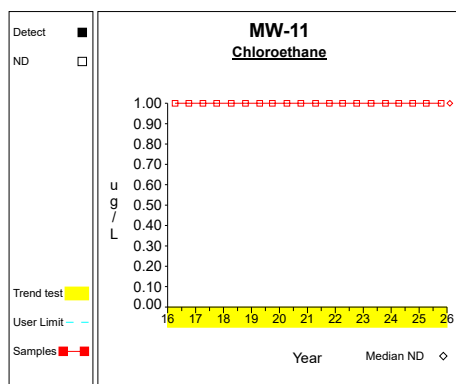
Graph 13



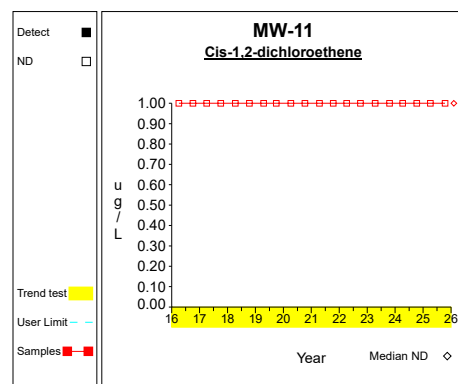
Graph 14



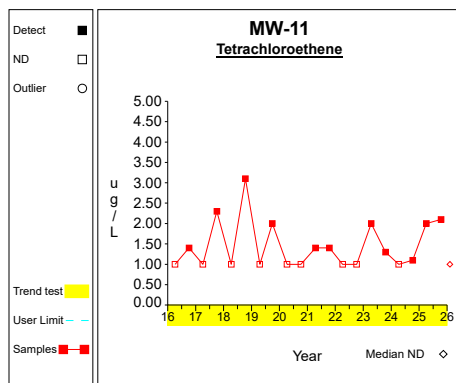
Graph 15



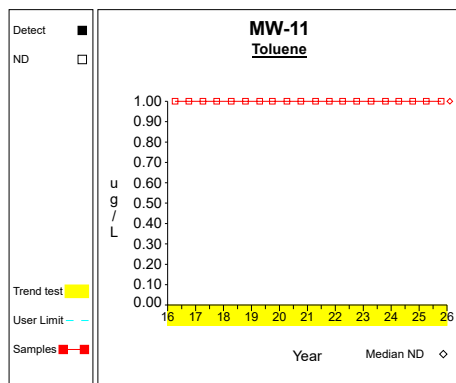
Graph 16



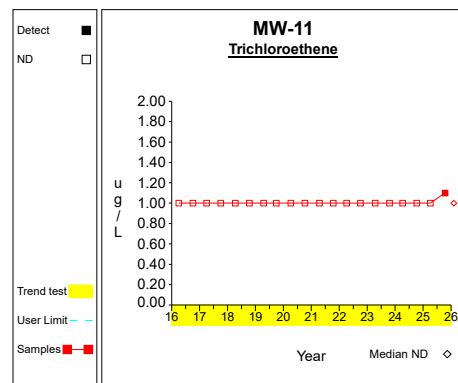
Graph 17



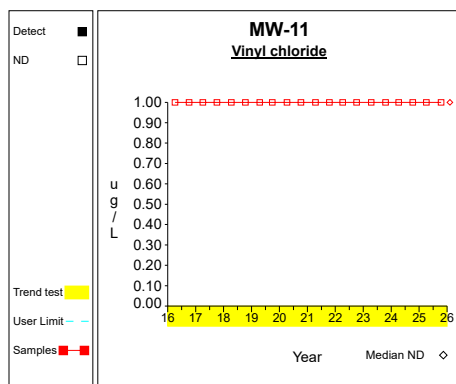
Graph 18



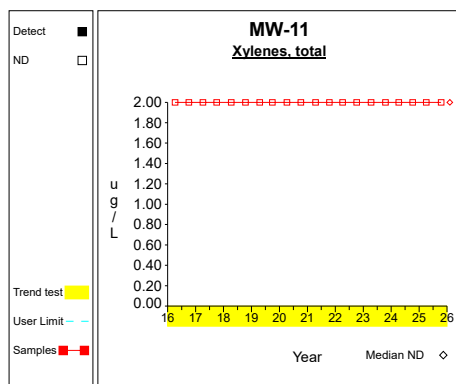
Graph 19



Graph 20

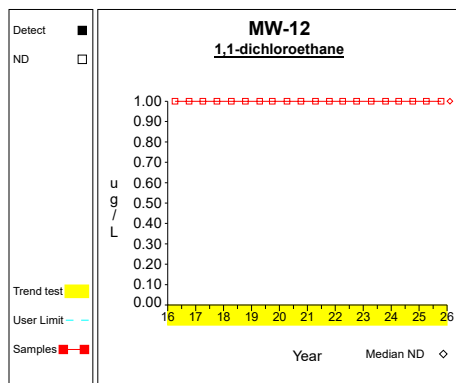


Graph 21

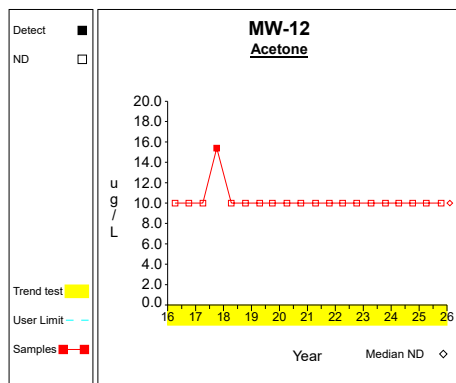


Graph 22

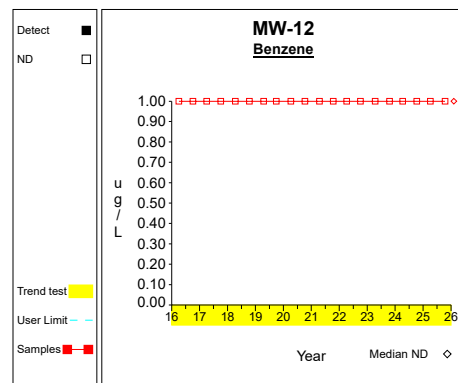
Time Series



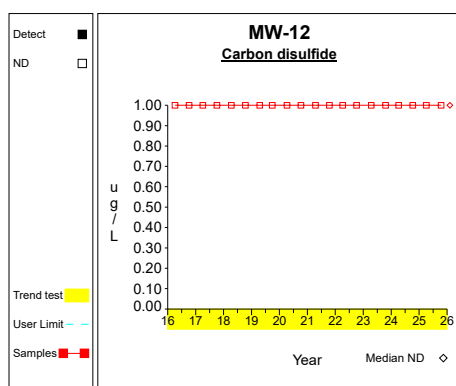
Graph 23



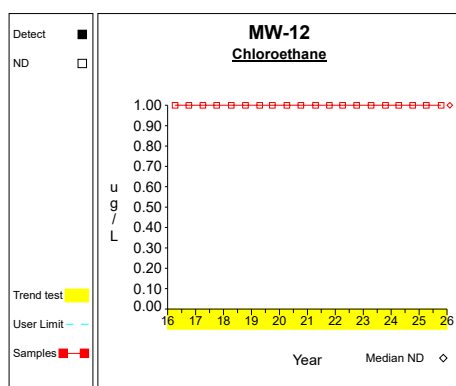
Graph 24



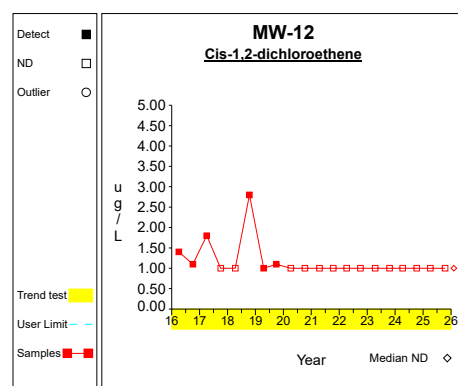
Graph 25



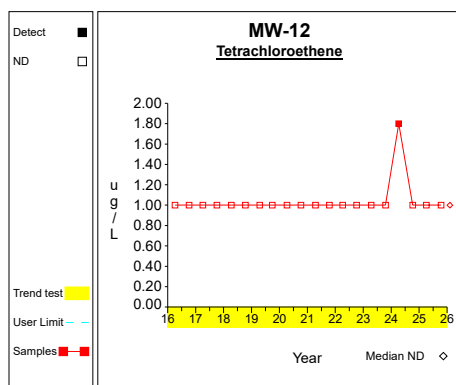
Graph 26



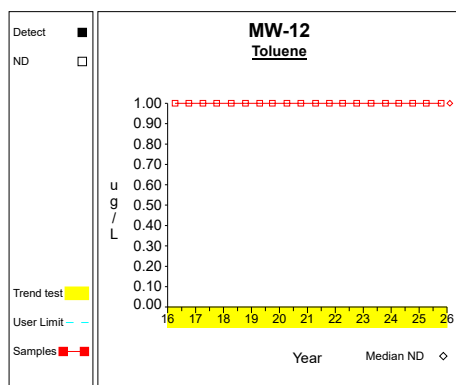
Graph 27



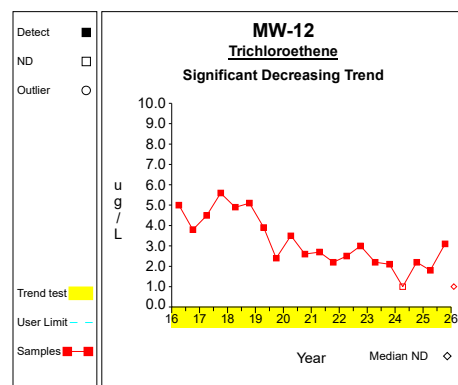
Graph 28



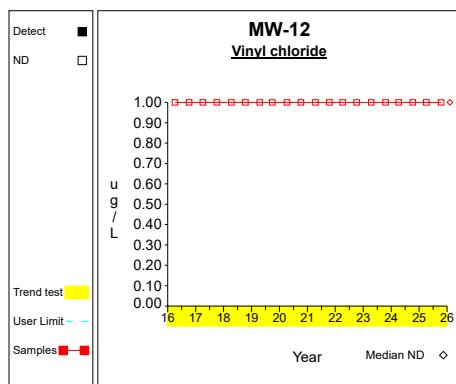
Graph 29



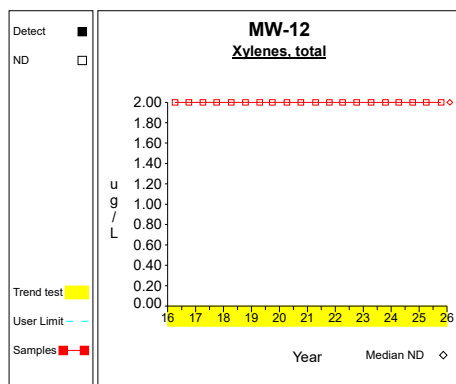
Graph 30



Graph 31

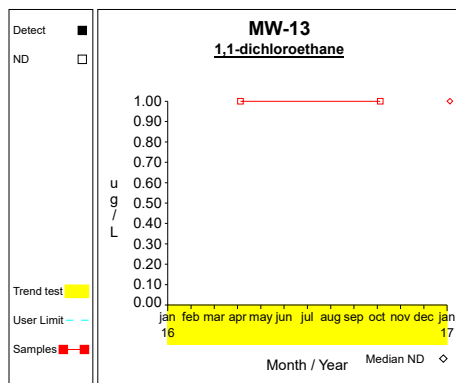


Graph 32

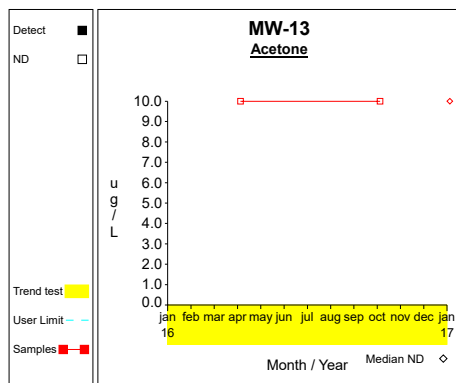


Graph 33

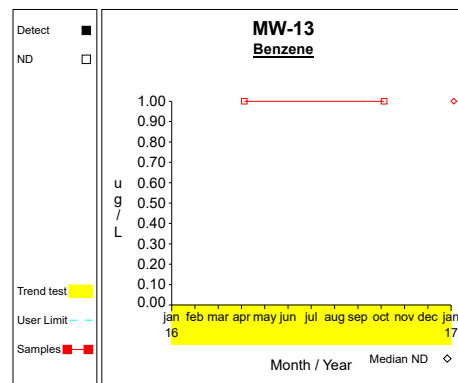
Time Series



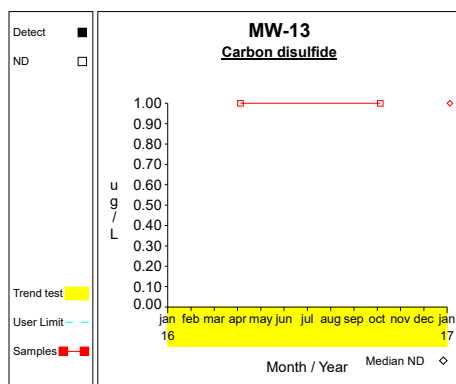
Graph 34



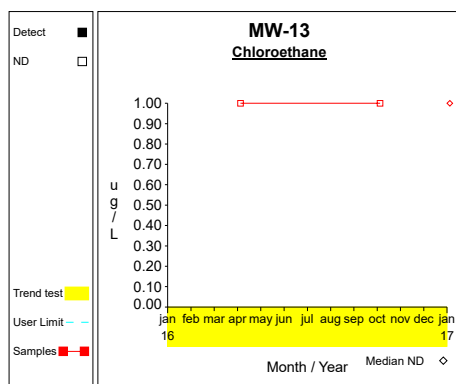
Graph 35



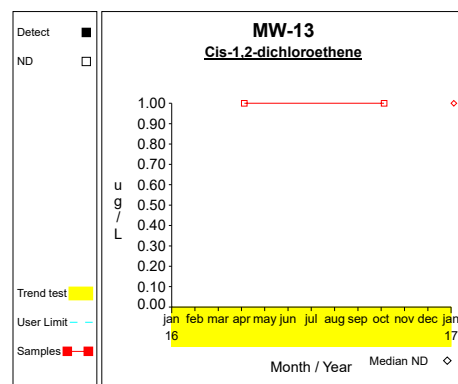
Graph 36



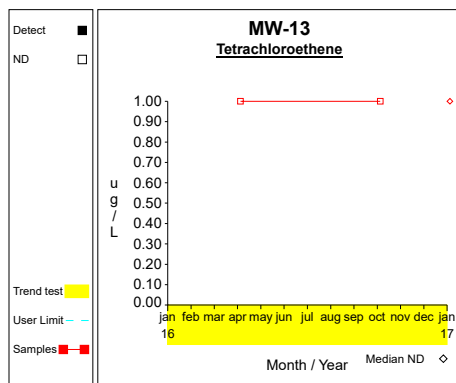
Graph 37



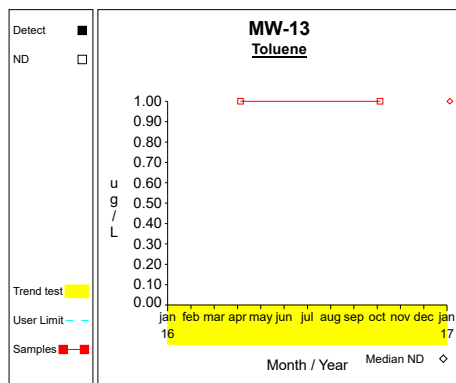
Graph 38



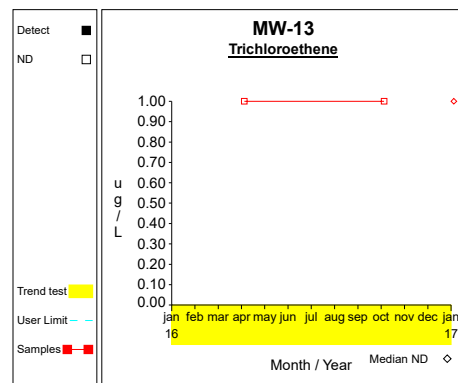
Graph 39



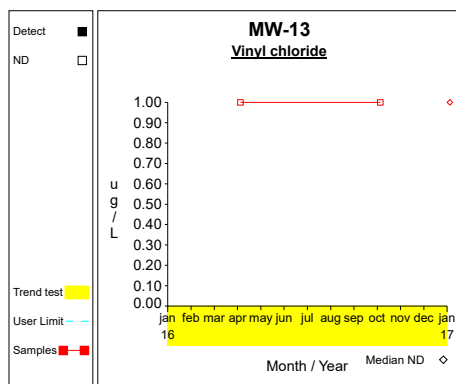
Graph 40



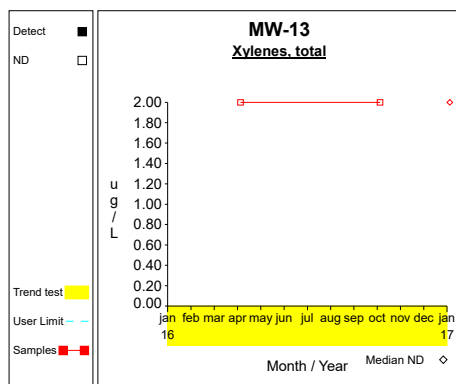
Graph 41



Graph 42

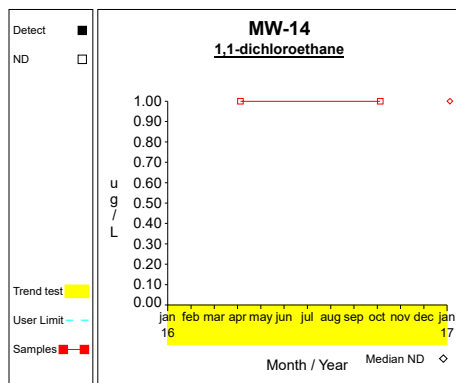


Graph 43

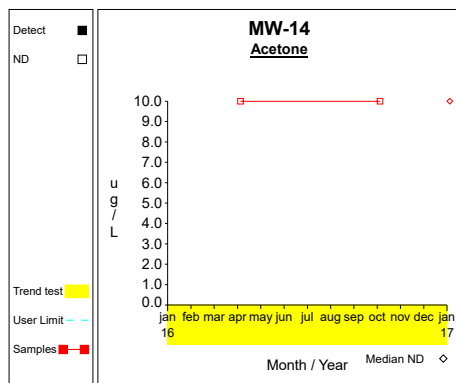


Graph 44

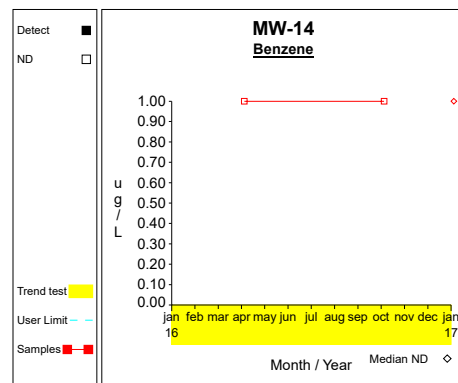
Time Series



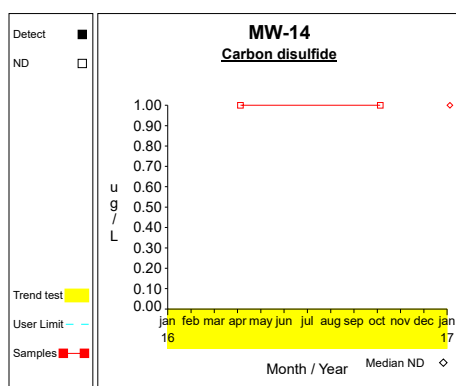
Graph 45



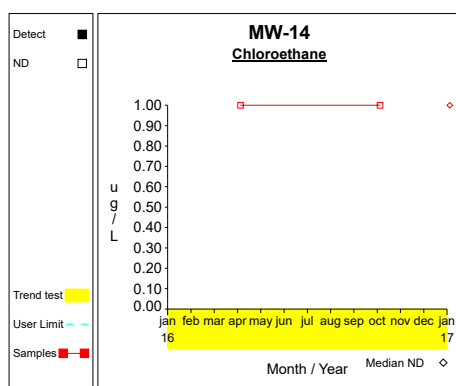
Graph 46



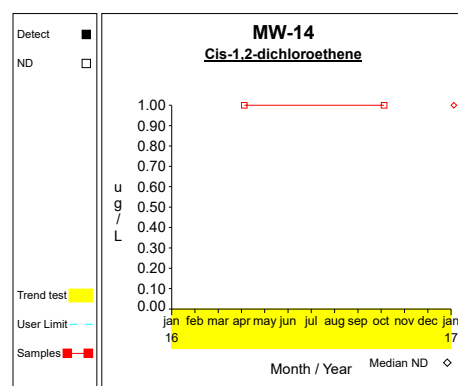
Graph 47



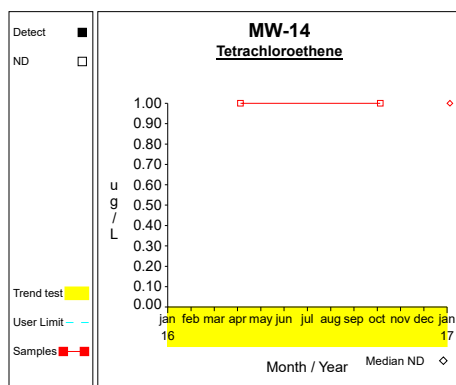
Graph 48



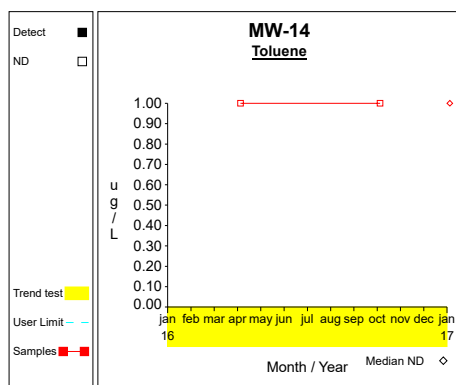
Graph 49



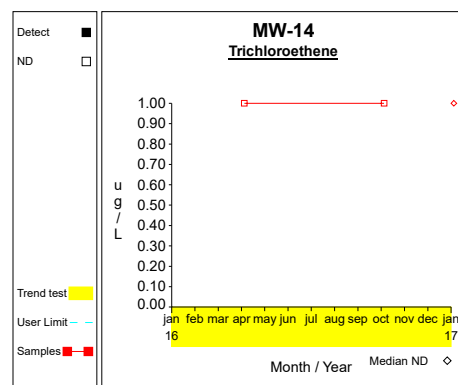
Graph 50



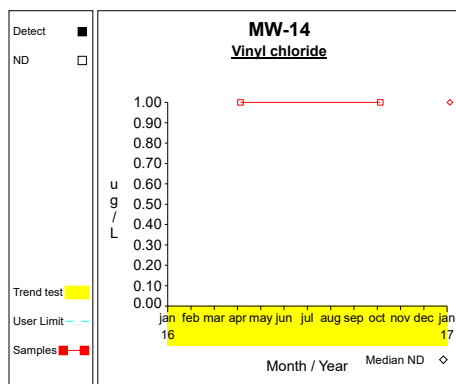
Graph 51



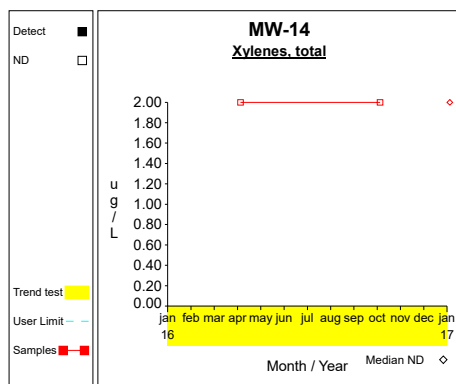
Graph 52



Graph 53

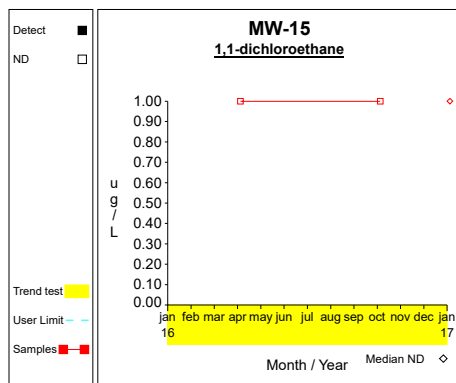


Graph 54

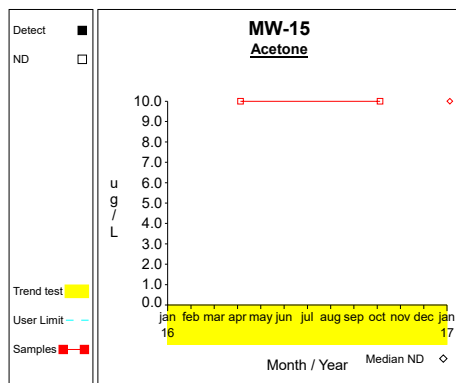


Graph 55

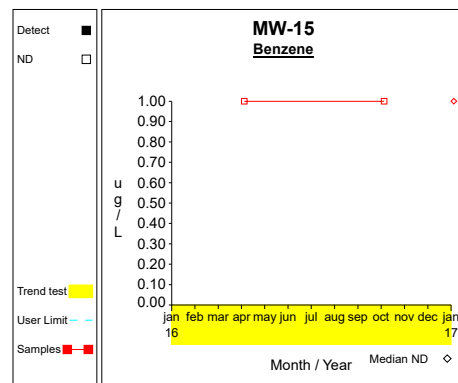
Time Series



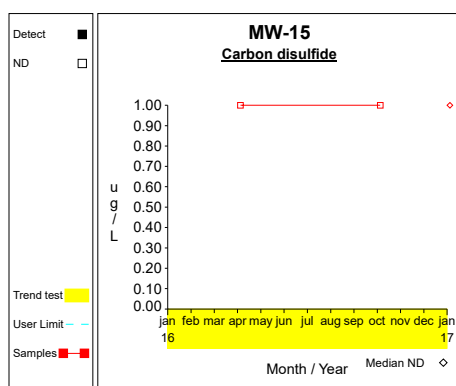
Graph 56



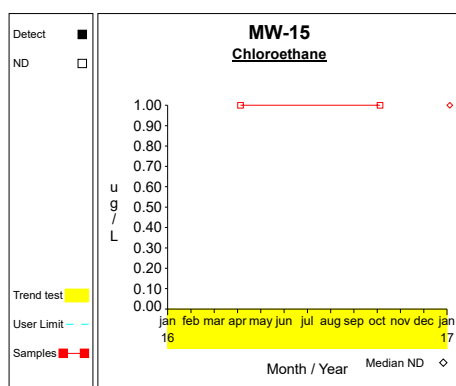
Graph 57



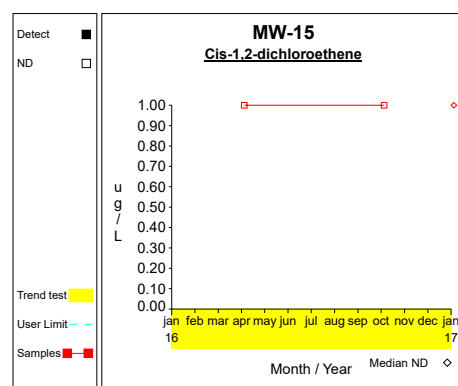
Graph 58



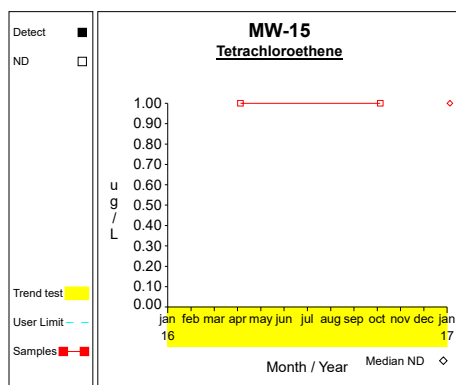
Graph 59



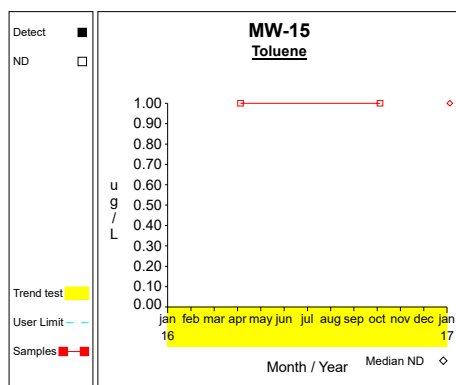
Graph 60



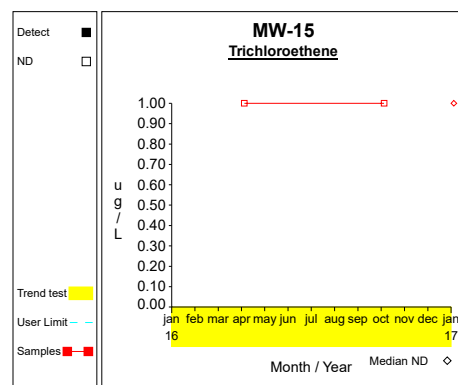
Graph 61



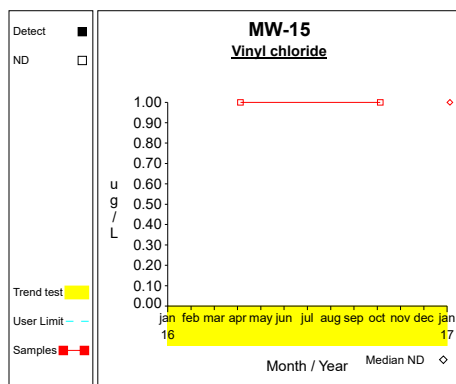
Graph 62



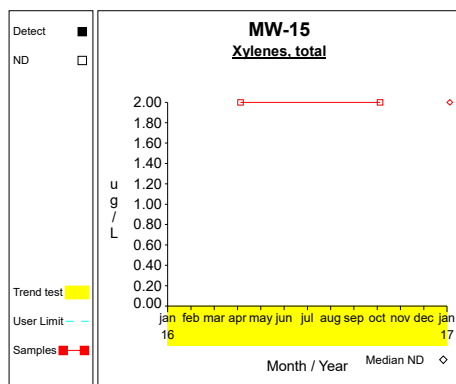
Graph 63



Graph 64

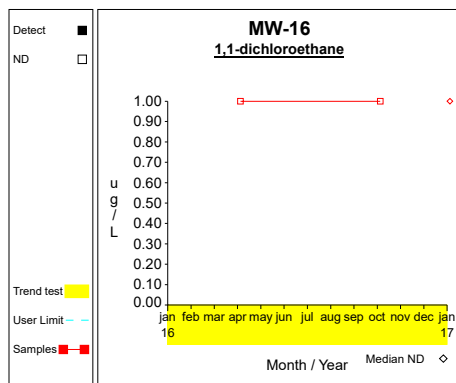


Graph 65

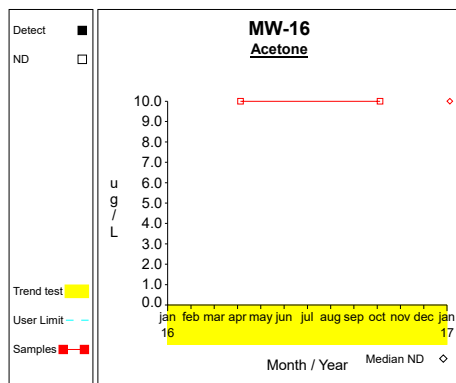


Graph 66

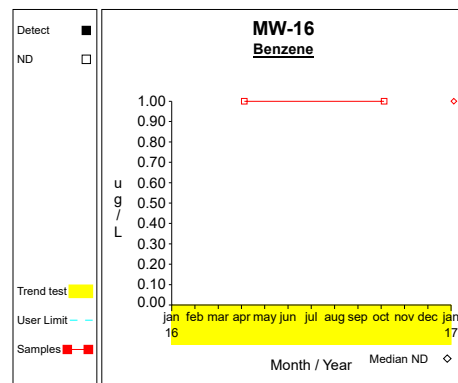
Time Series



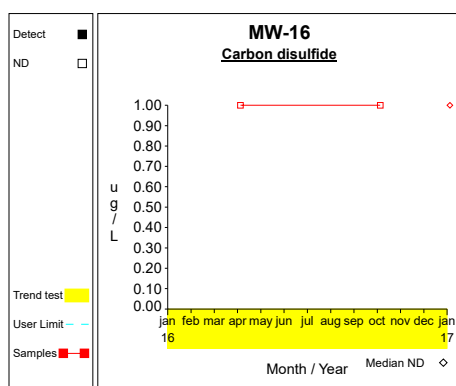
Graph 67



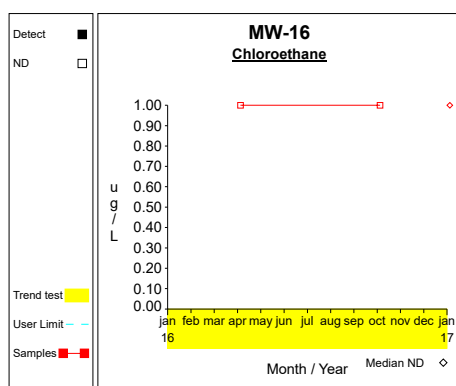
Graph 68



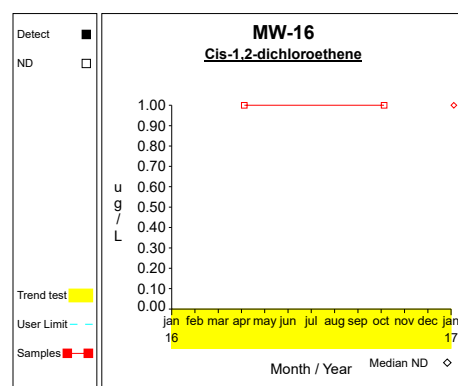
Graph 69



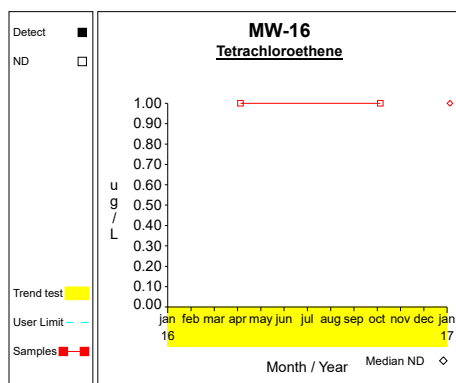
Graph 70



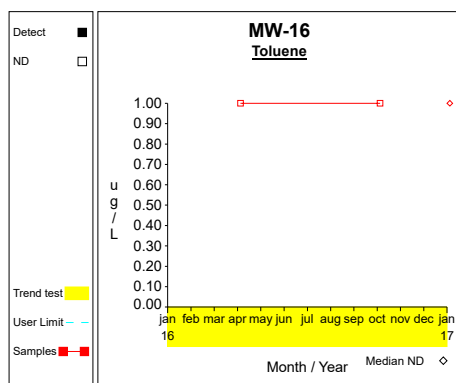
Graph 71



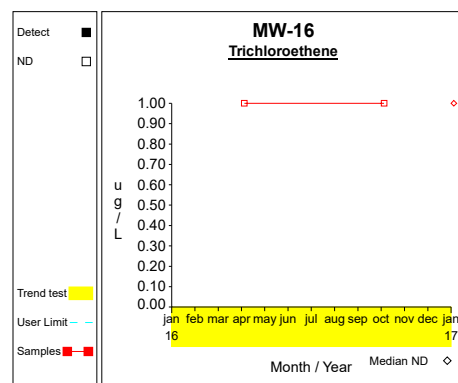
Graph 72



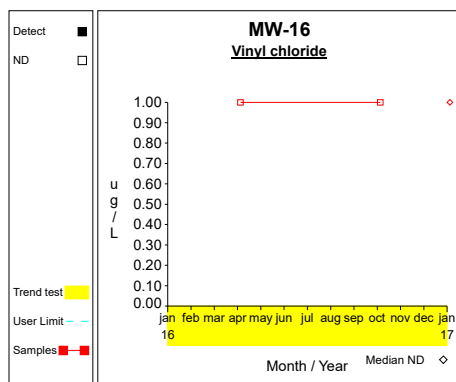
Graph 73



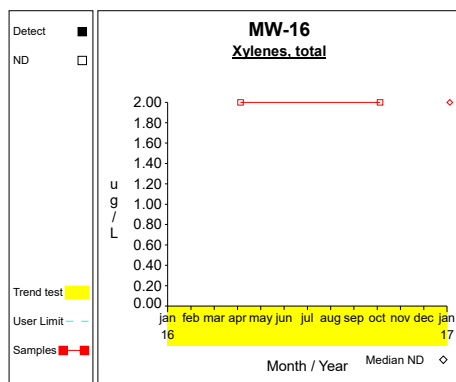
Graph 74



Graph 75

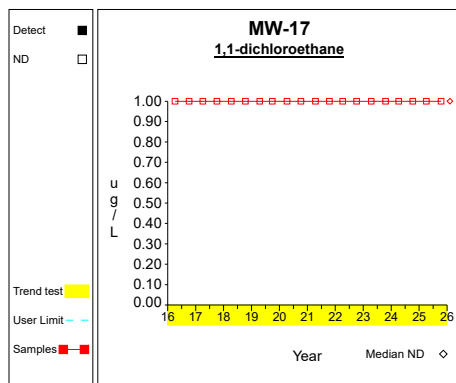


Graph 76

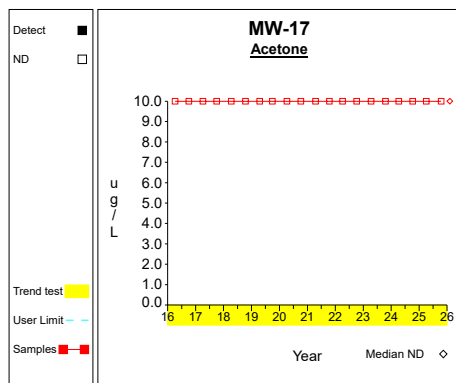


Graph 77

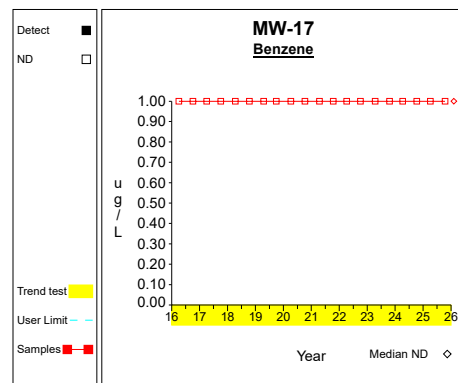
Time Series



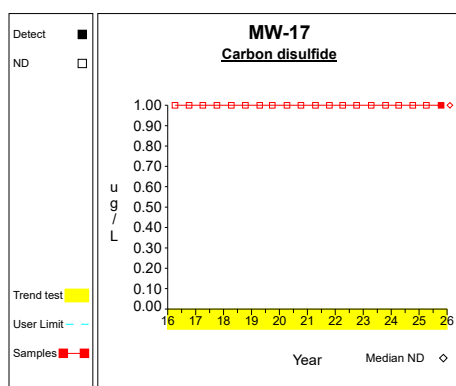
Graph 78



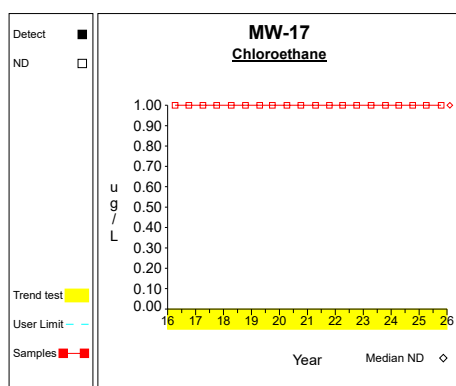
Graph 79



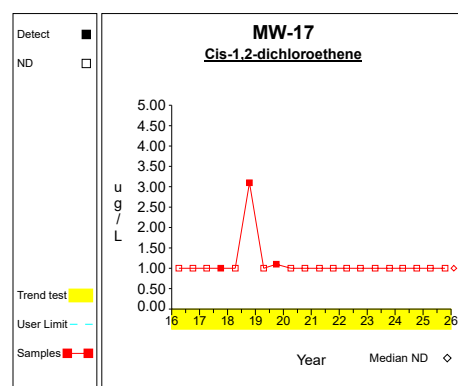
Graph 80



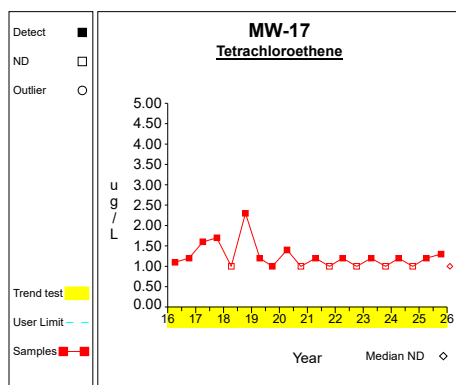
Graph 81



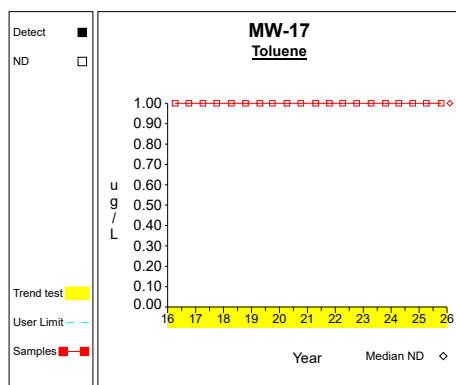
Graph 82



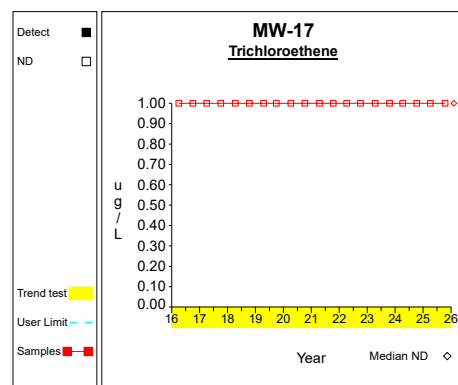
Graph 83



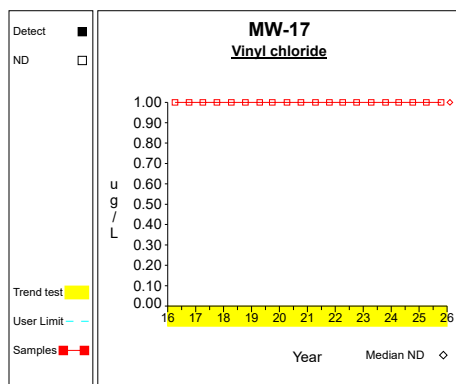
Graph 84



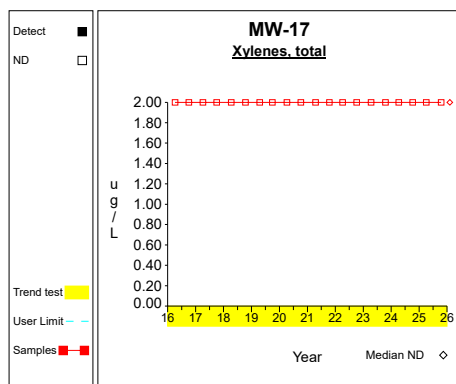
Graph 85



Graph 86

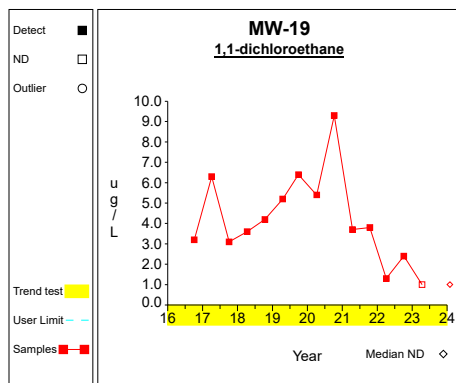


Graph 87

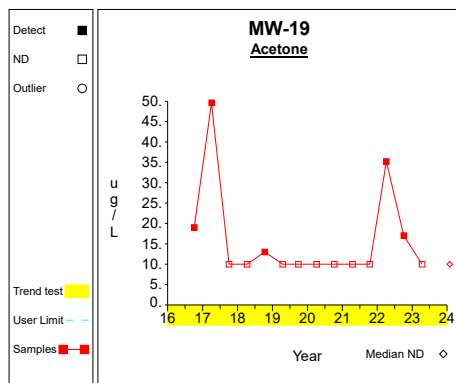


Graph 88

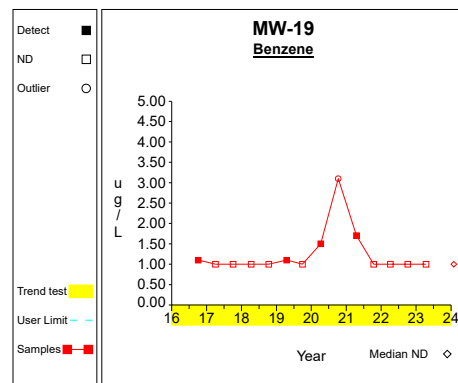
Time Series



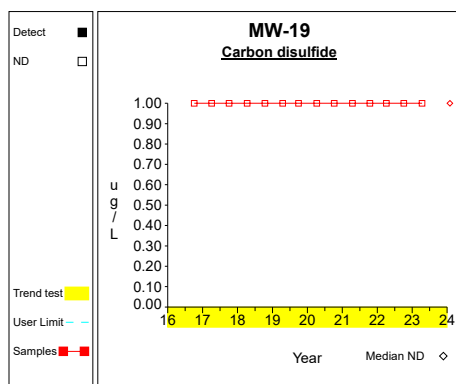
Graph 89



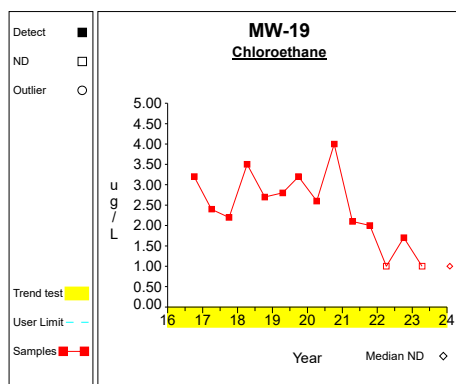
Graph 90



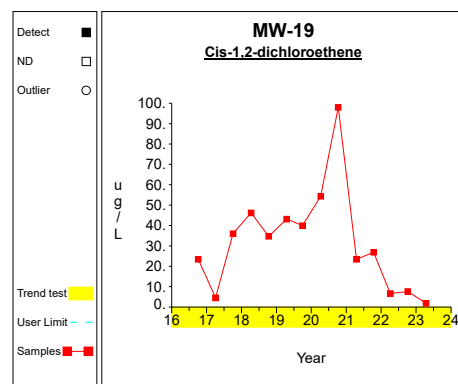
Graph 91



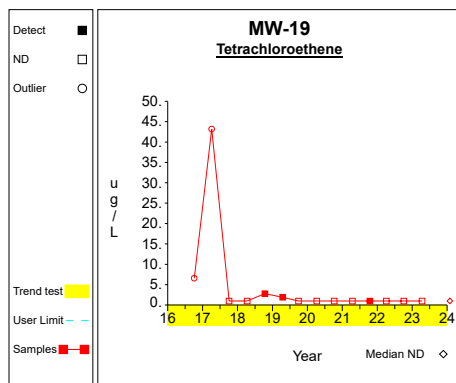
Graph 92



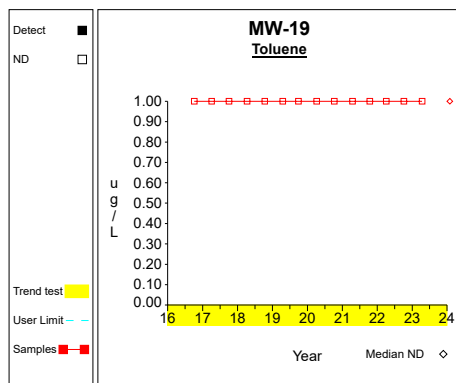
Graph 93



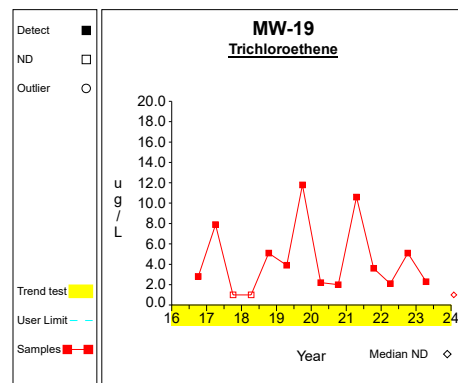
Graph 94



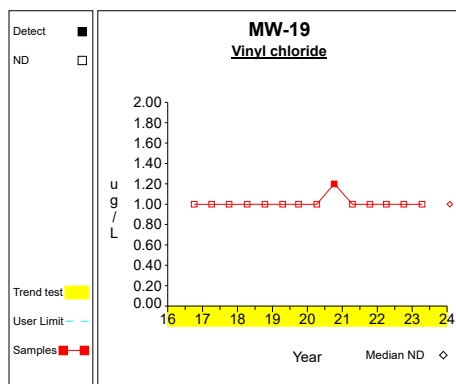
Graph 95



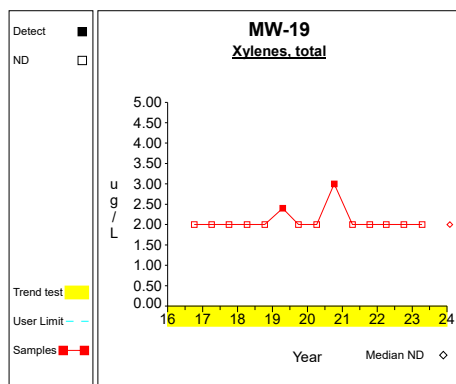
Graph 96



Graph 97

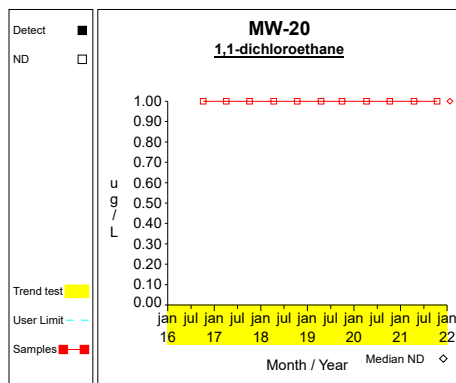


Graph 98

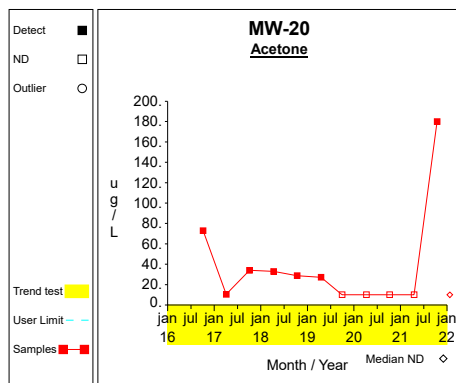


Graph 99

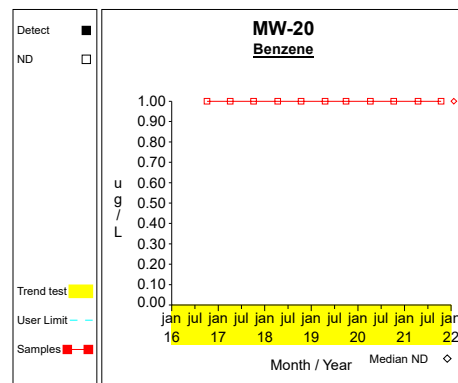
Time Series



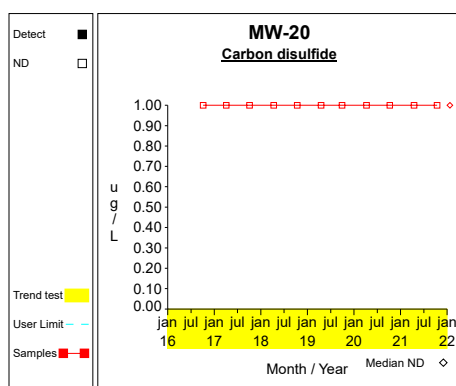
Graph 100



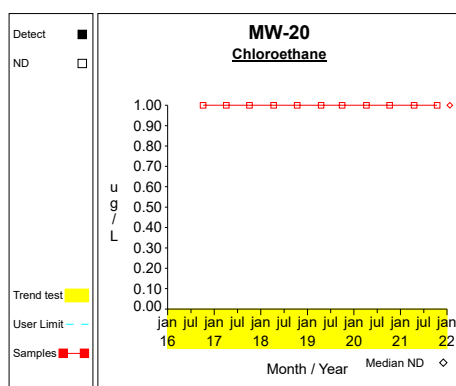
Graph 101



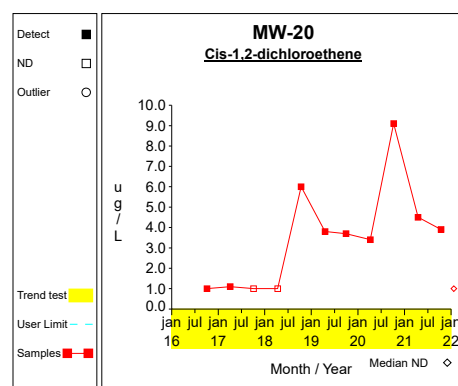
Graph 102



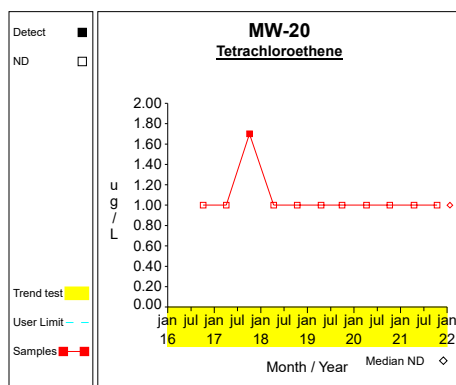
Graph 103



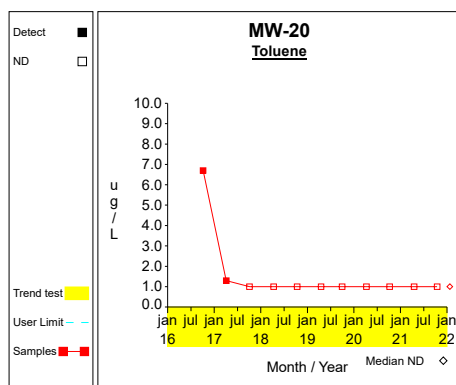
Graph 104



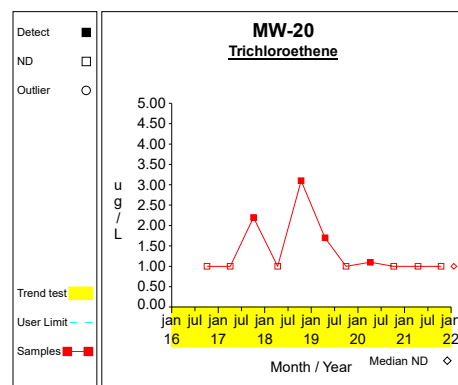
Graph 105



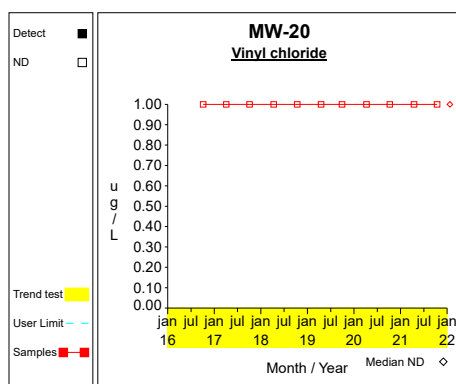
Graph 106



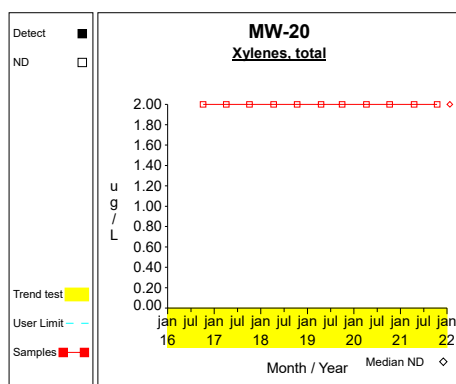
Graph 107



Graph 108

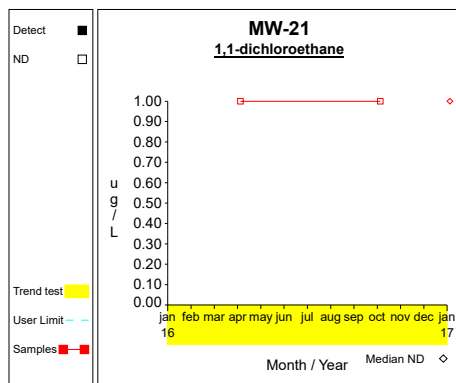


Graph 109

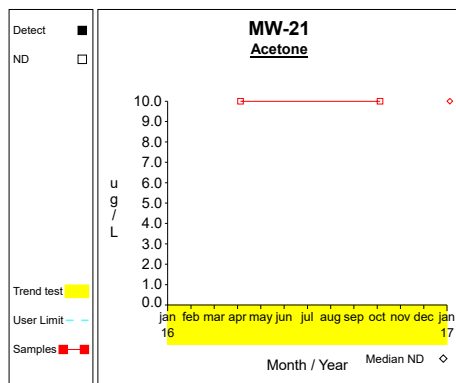


Graph 110

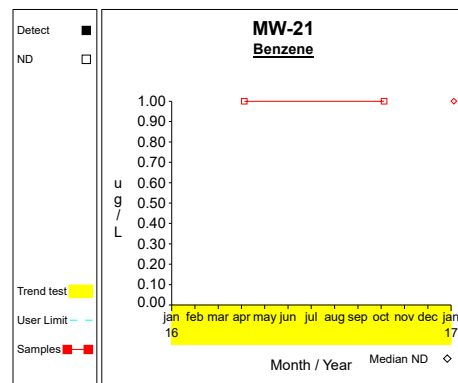
Time Series



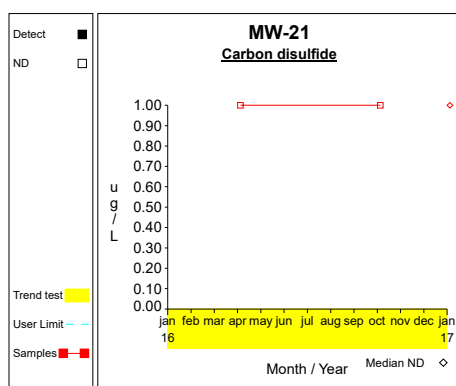
Graph 111



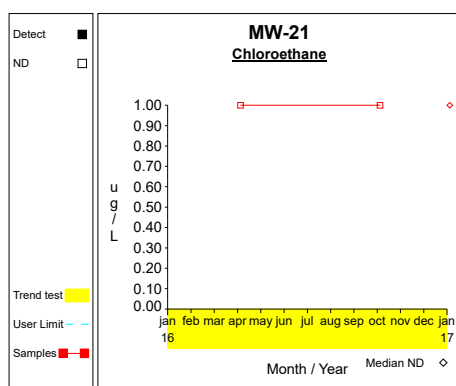
Graph 112



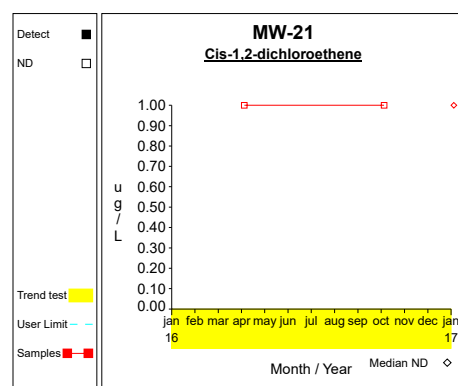
Graph 113



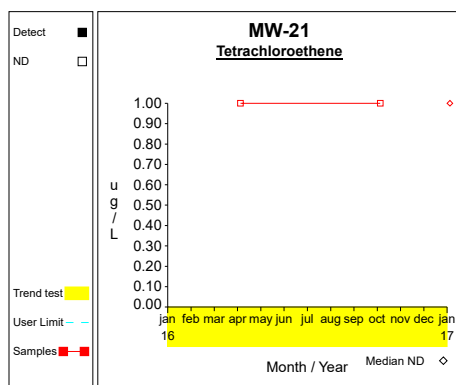
Graph 114



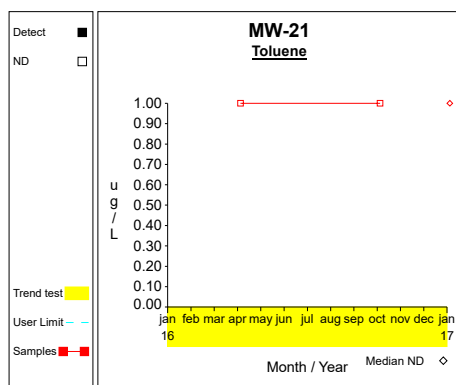
Graph 115



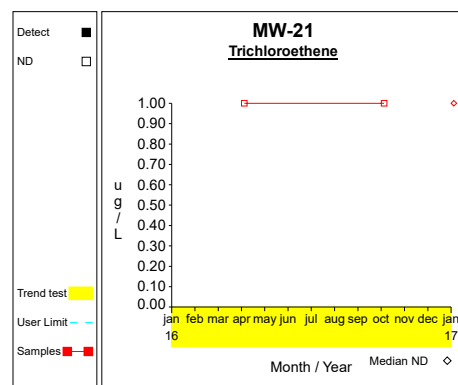
Graph 116



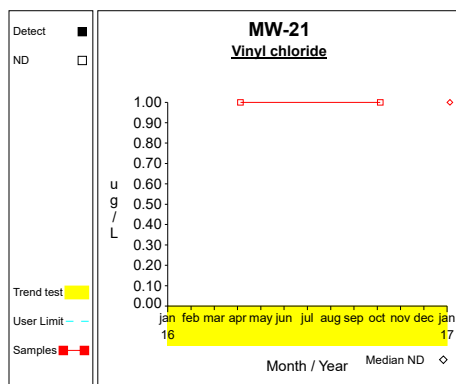
Graph 117



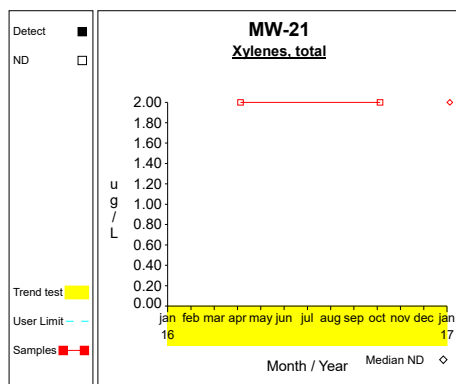
Graph 118



Graph 119



Graph 120



Graph 121

Attachment C

Assessment Statistics for VOCs

Table 1

**Confidence Intervals for Comparing the Mean of the Last
4 Measurements to an Assessment Monitoring Standard**

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	Trend
Carbon disulfide	ug/L	MW-11	4	0.650	0.300	1.176	0.297	1.003	700.000	
Tetrachloroethene	ug/L	MW-11	4	1.425	0.763	1.176	0.527	2.323	5.000	
Trichloroethene	ug/L	MW-11	4	0.650	0.300	1.176	0.297	1.003	5.000	
Carbon disulfide	ug/L	MW-12	4	0.500	0.000	1.176	0.500	0.500	700.000	
Tetrachloroethene	ug/L	MW-12	4	0.825	0.650	1.176	0.060	1.590	5.000	
Trichloroethene	ug/L	MW-12	4	1.900	1.080	1.176	0.629	3.171	5.000	dec
Carbon disulfide	ug/L	MW-17	4	0.625	0.250	1.176	0.331	0.919	700.000	
Tetrachloroethene	ug/L	MW-17	4	1.050	0.370	1.176	0.615	1.485	5.000	
Trichloroethene	ug/L	MW-17	4	0.500	0.000	1.176	0.500	0.500	5.000	

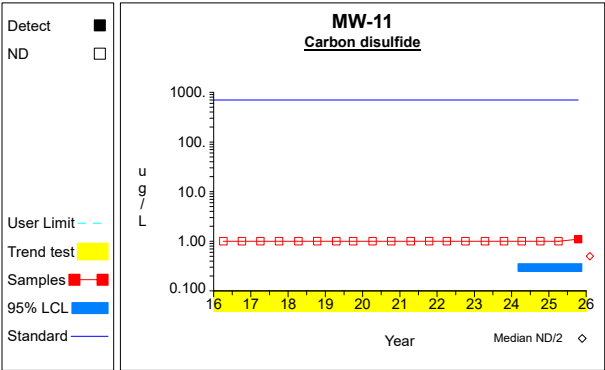
* - Insufficient Data

** - Significant Exceedance

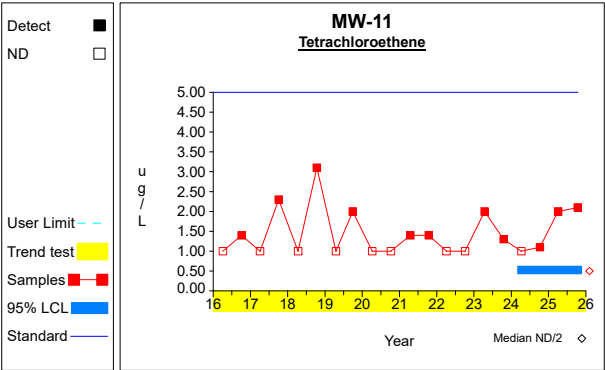
LCL = Lower Confidence Limit

UCL = Upper Confidence Limit

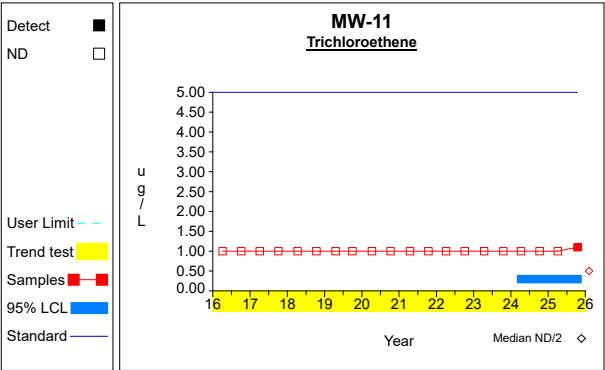
Confidence Limits (Assessment)



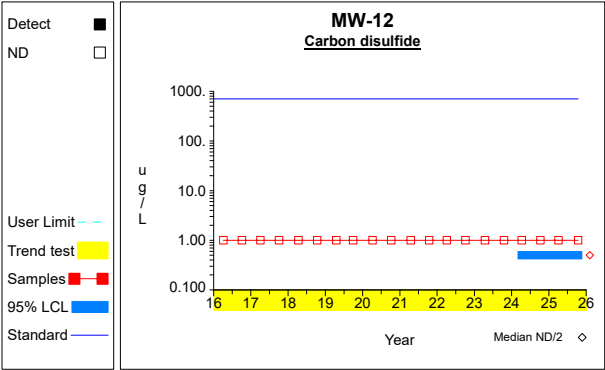
Graph 1



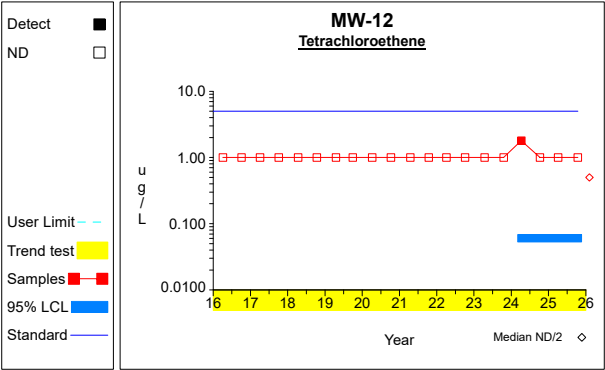
Graph 2



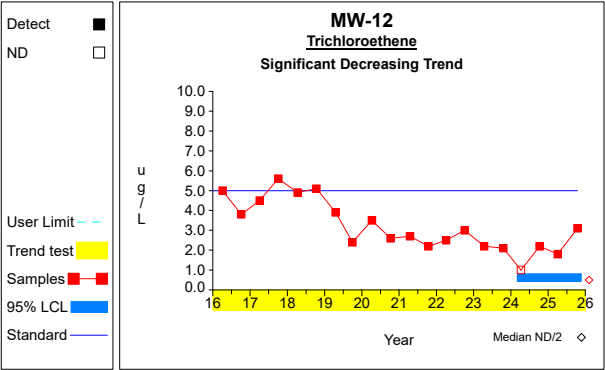
Graph 3



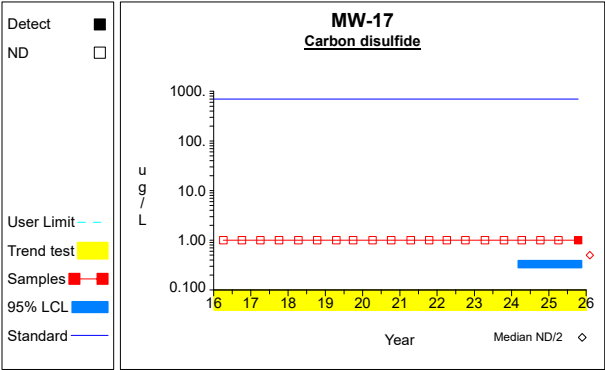
Graph 4



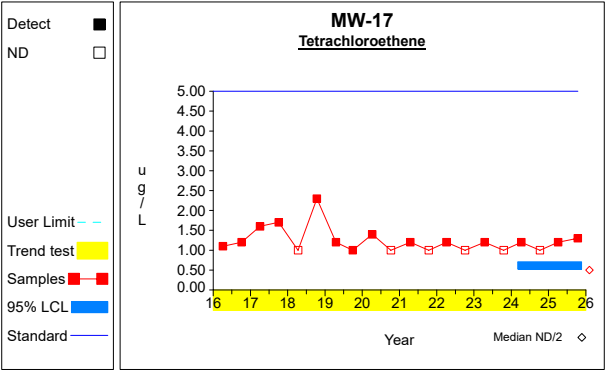
Graph 5



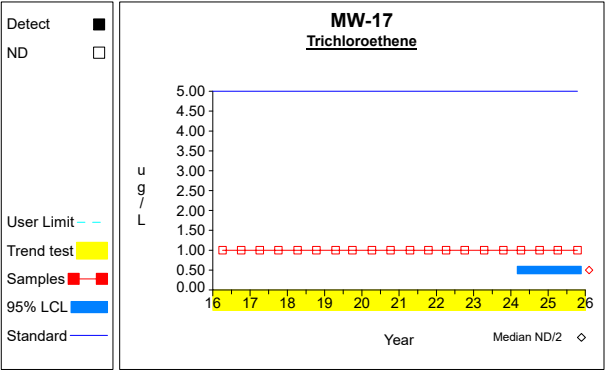
Graph 6



Graph 7



Graph 8

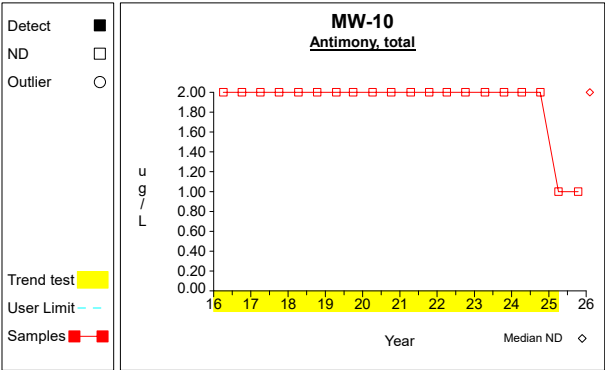


Graph 9

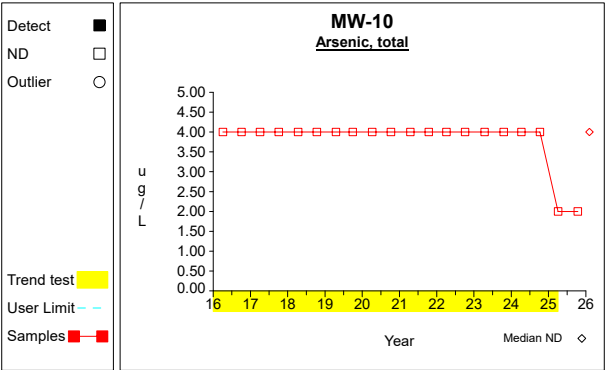
Attachment D

Time Series Plots of Trace Metals Data

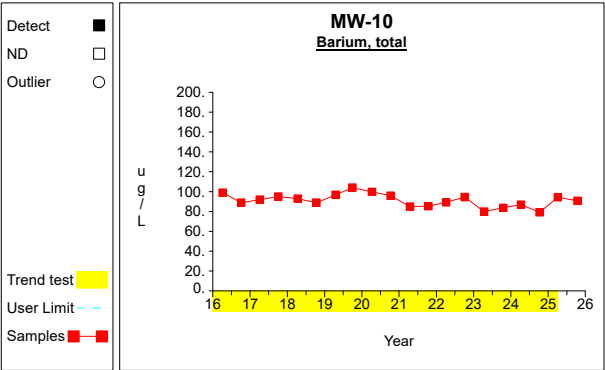
Time Series



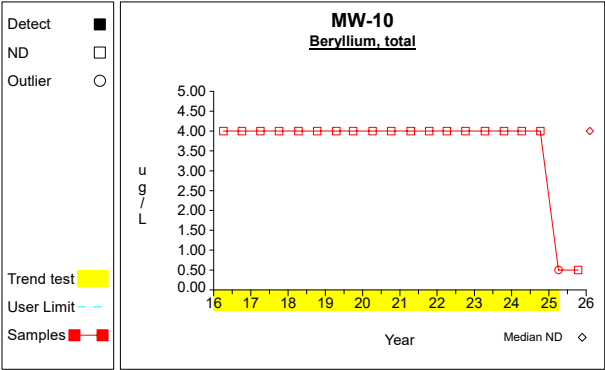
Graph 1



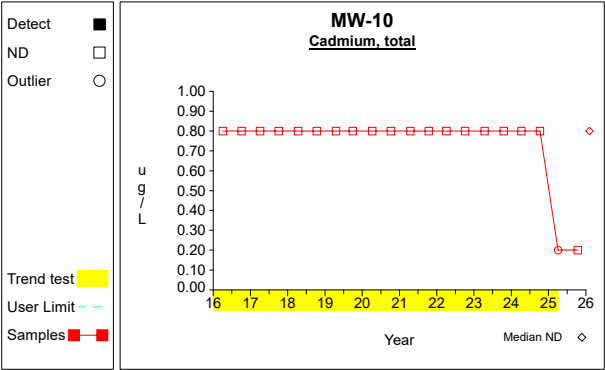
Graph 2



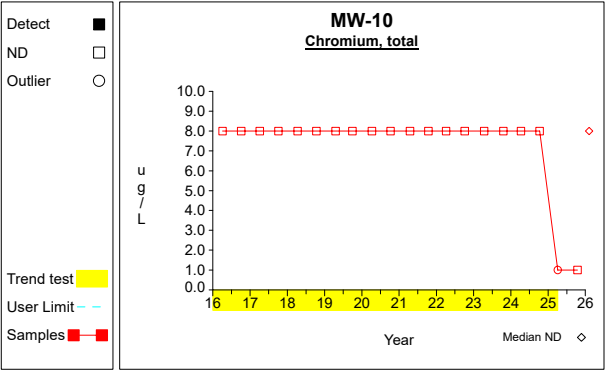
Graph 3



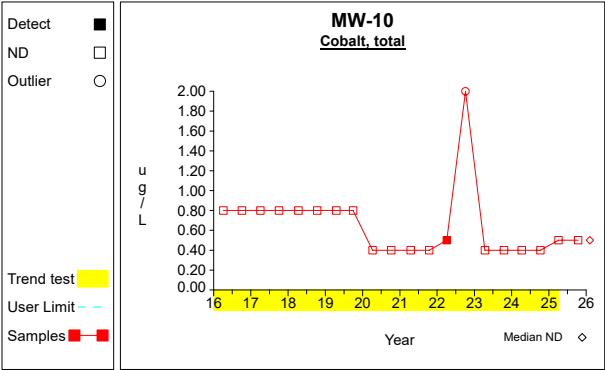
Graph 4



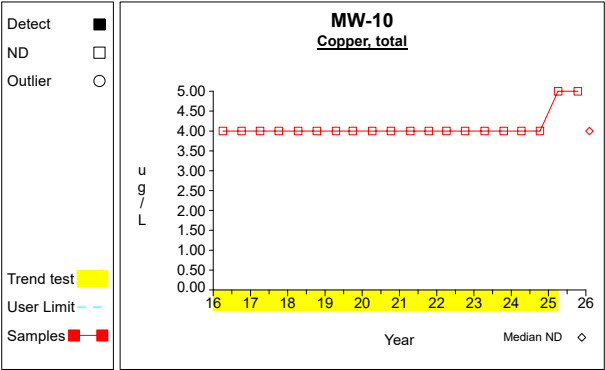
Graph 5



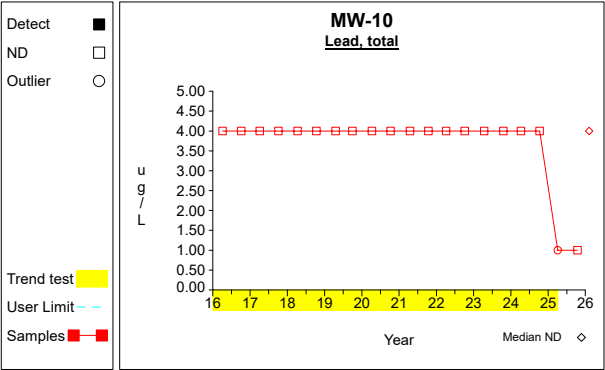
Graph 6



Graph 7

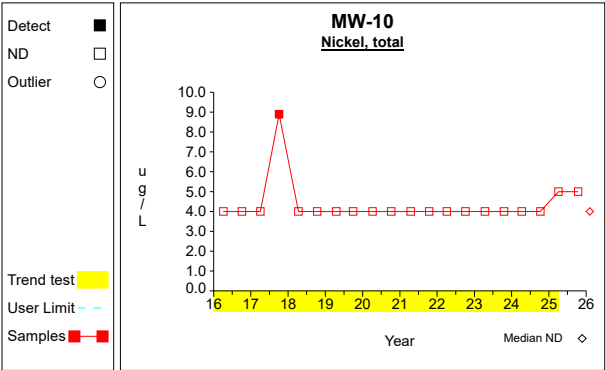


Graph 8

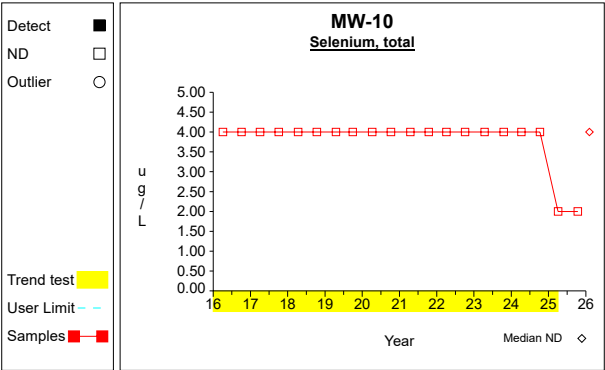


Graph 9

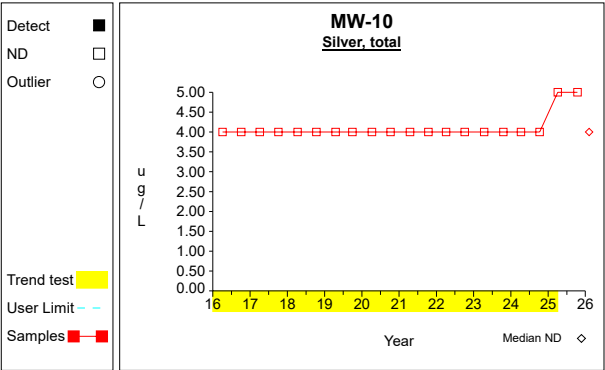
Time Series



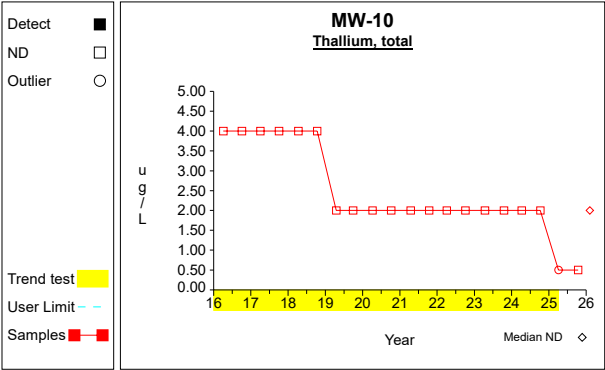
Graph 10



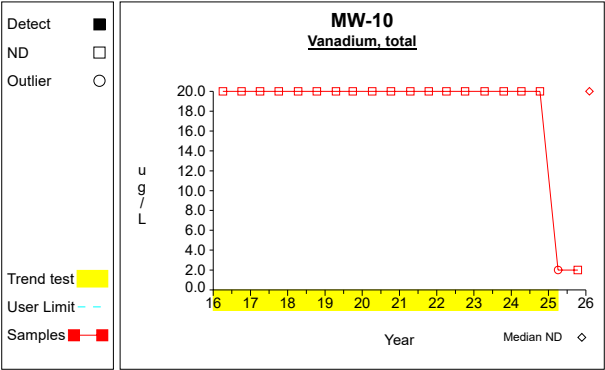
Graph 11



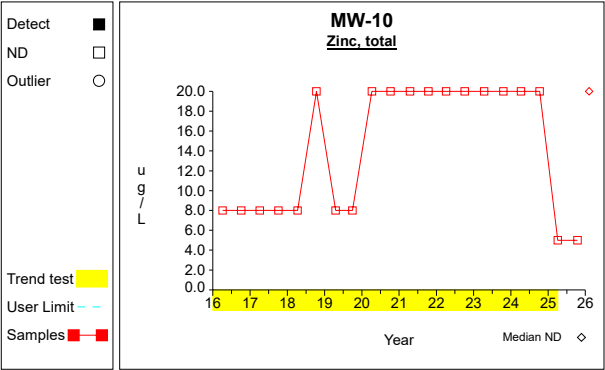
Graph 12



Graph 13

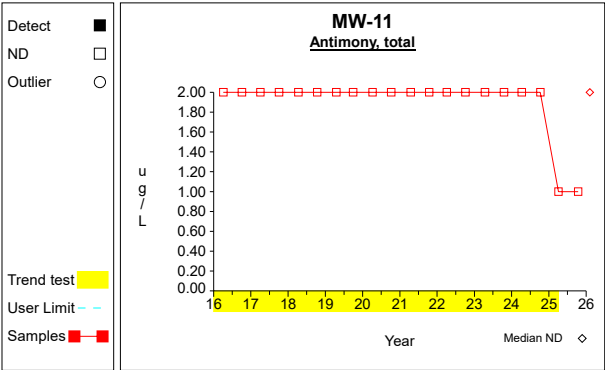


Graph 14

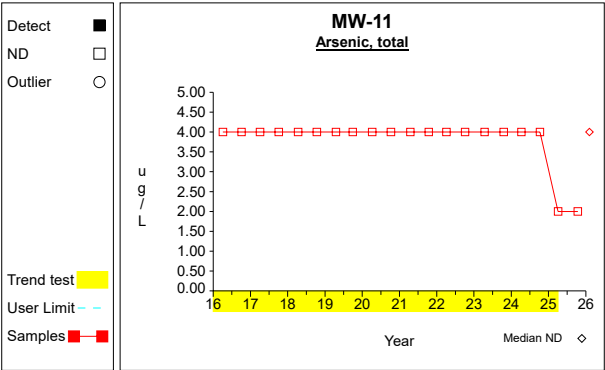


Graph 15

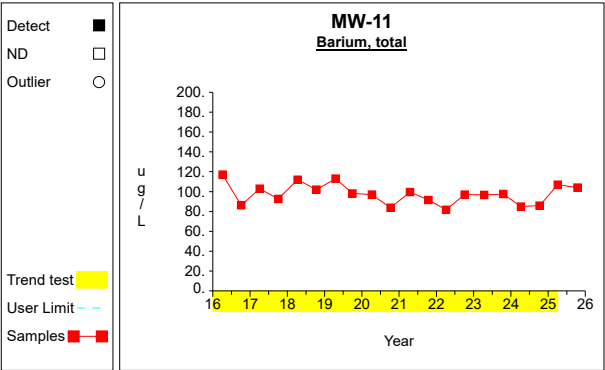
Time Series



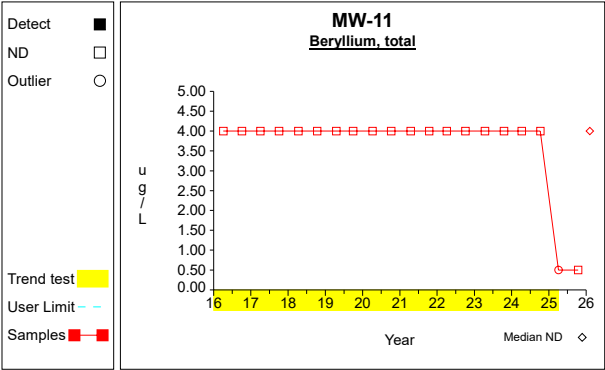
Graph 16



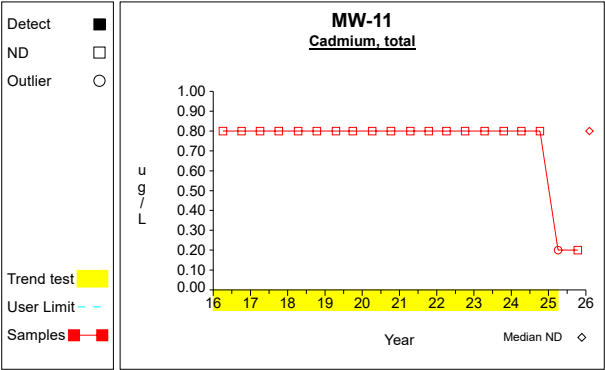
Graph 17



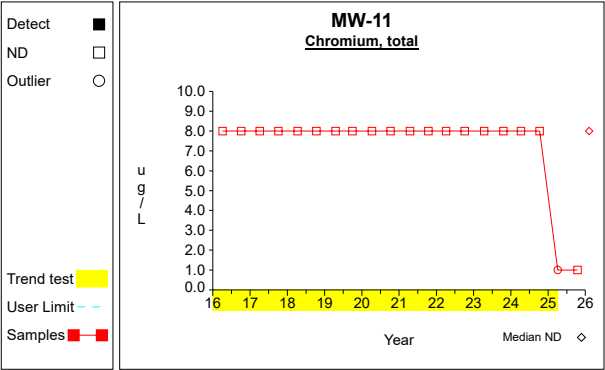
Graph 18



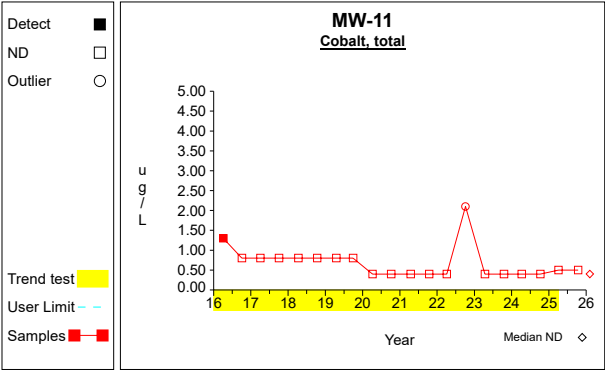
Graph 19



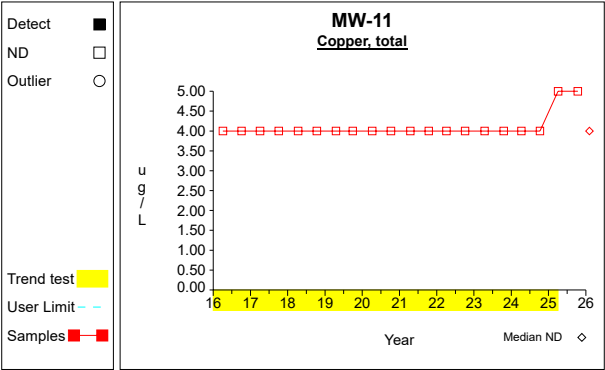
Graph 20



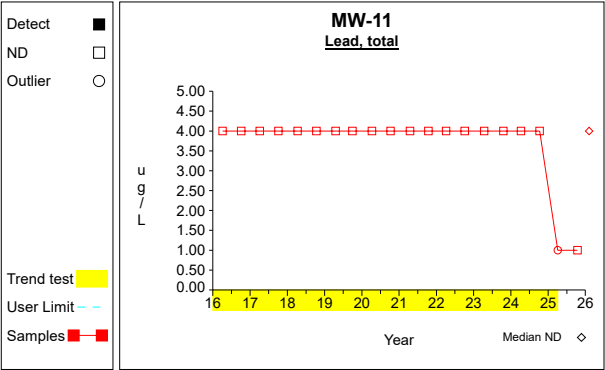
Graph 21



Graph 22

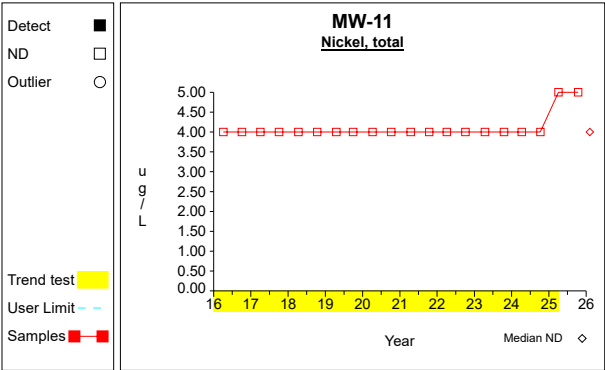


Graph 23

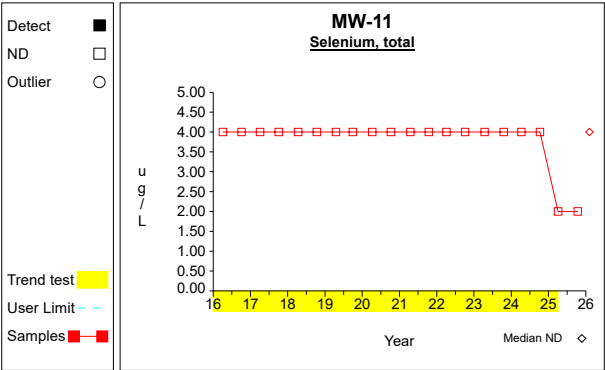


Graph 24

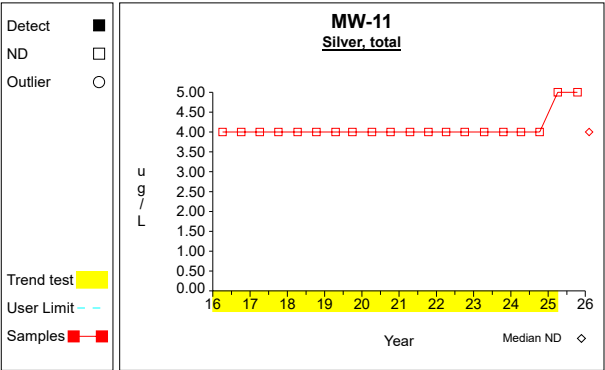
Time Series



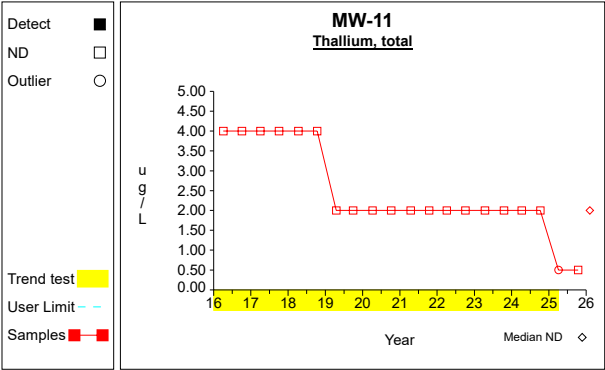
Graph 25



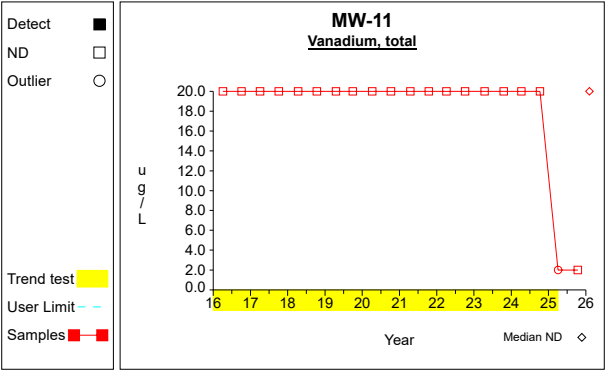
Graph 26



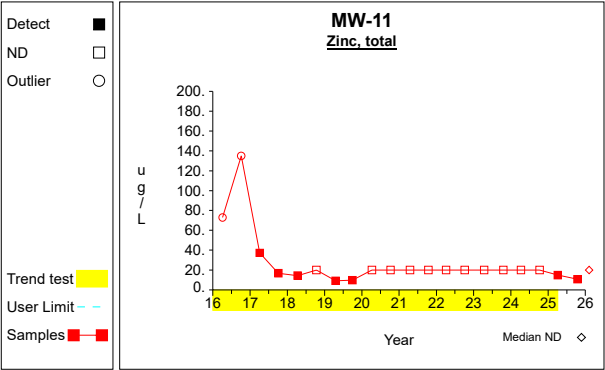
Graph 27



Graph 28

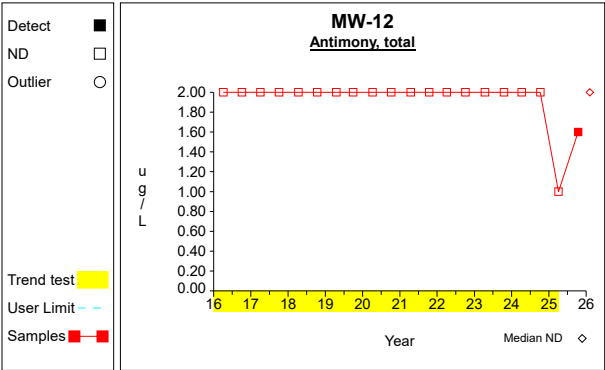


Graph 29

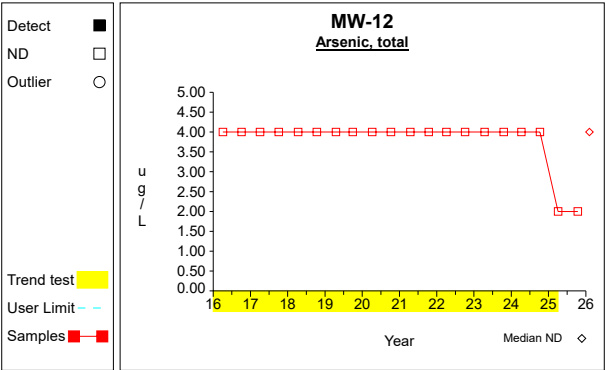


Graph 30

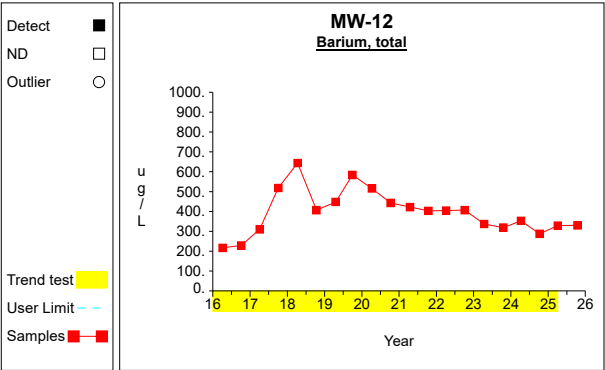
Time Series



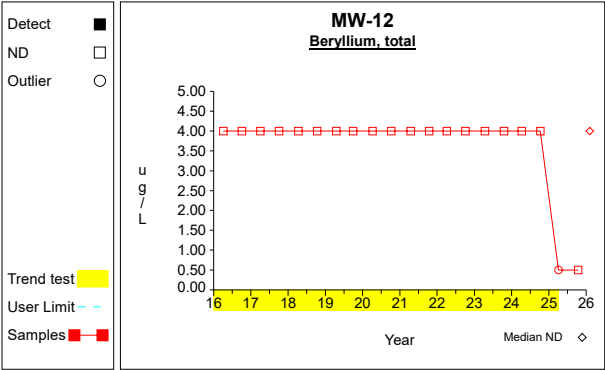
Graph 31



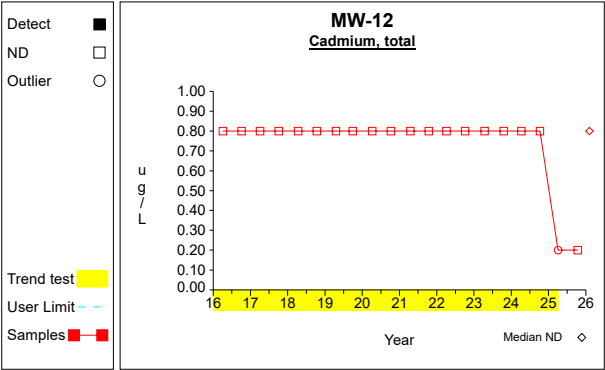
Graph 32



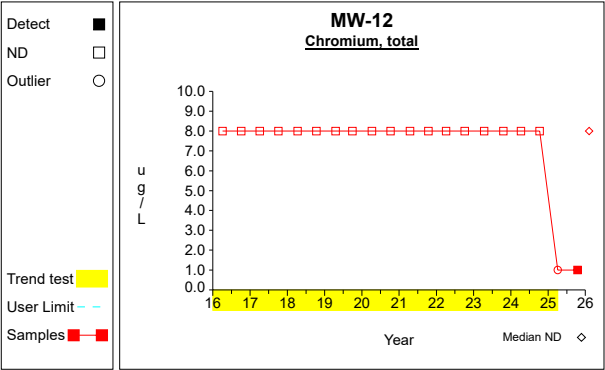
Graph 33



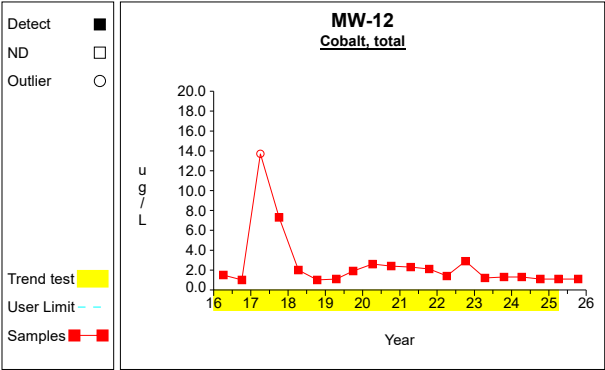
Graph 34



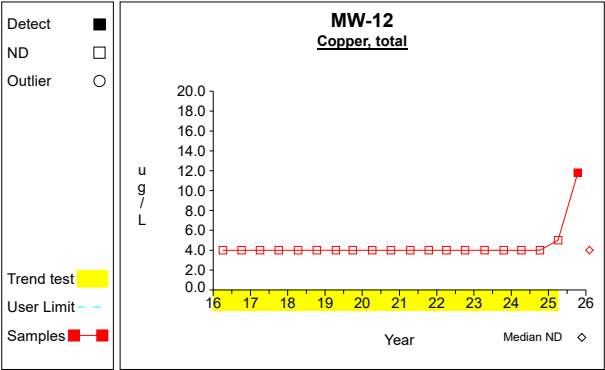
Graph 35



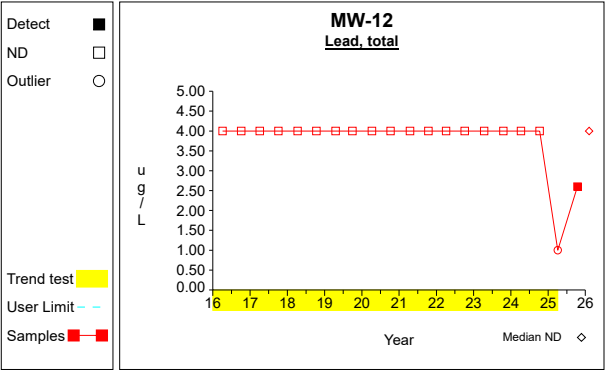
Graph 36



Graph 37

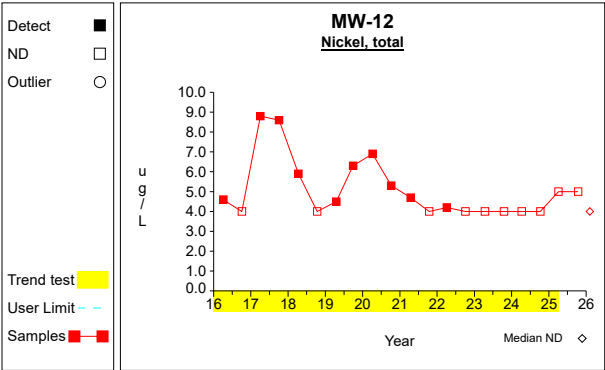


Graph 38

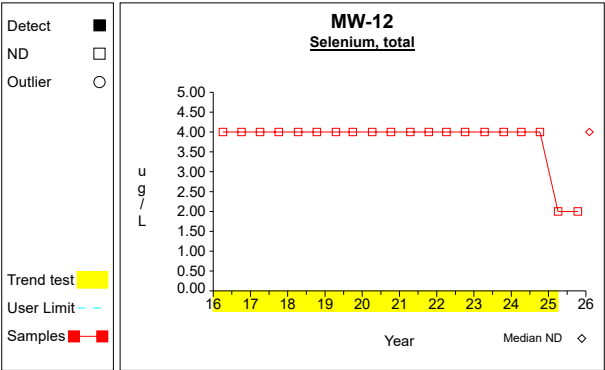


Graph 39

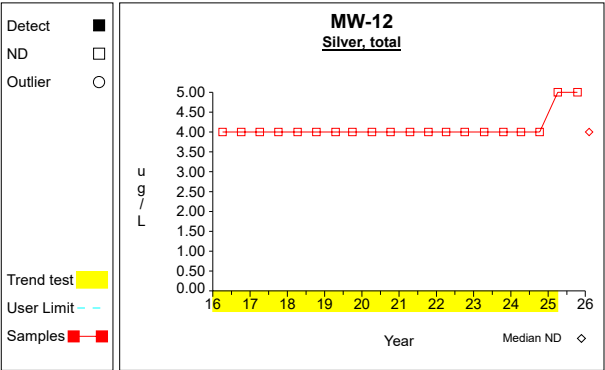
Time Series



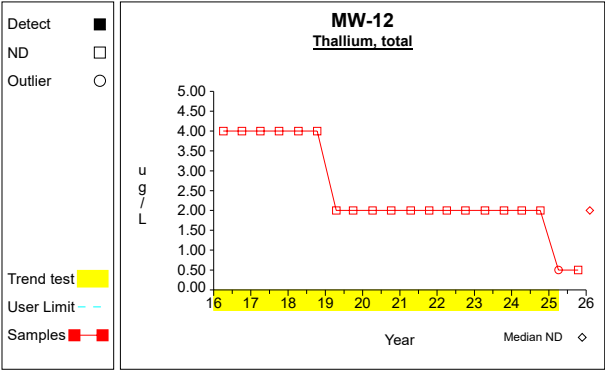
Graph 40



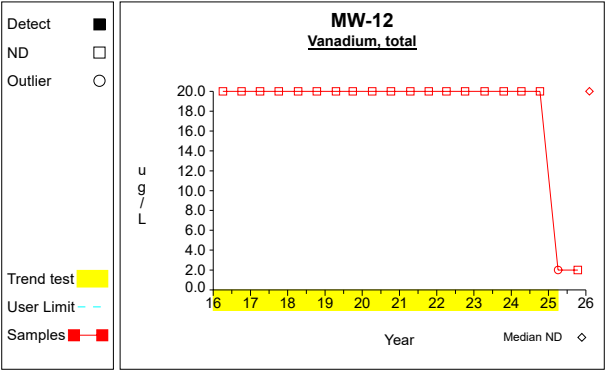
Graph 41



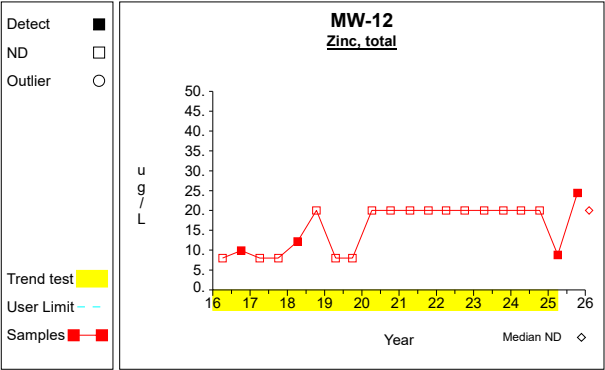
Graph 42



Graph 43

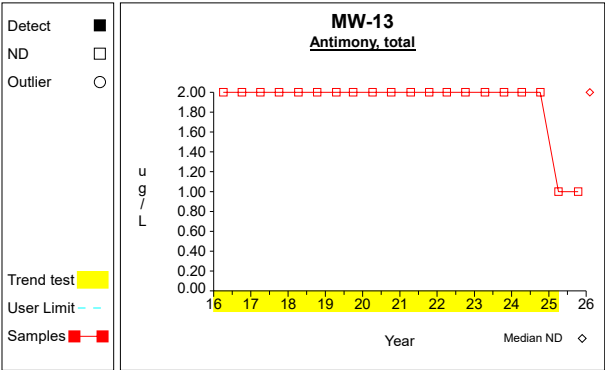


Graph 44

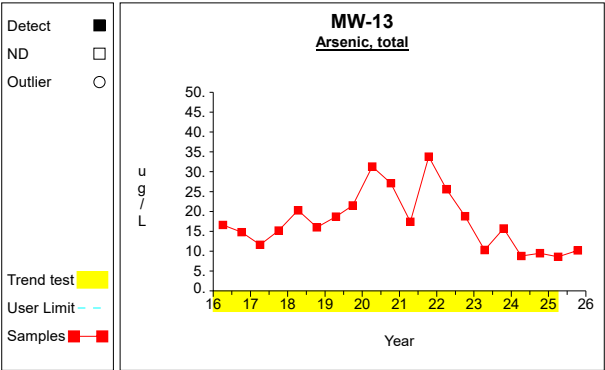


Graph 45

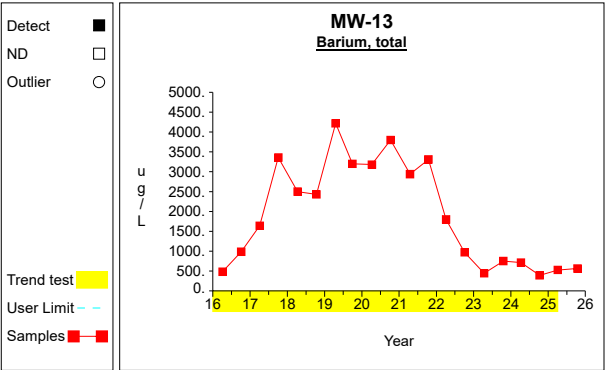
Time Series



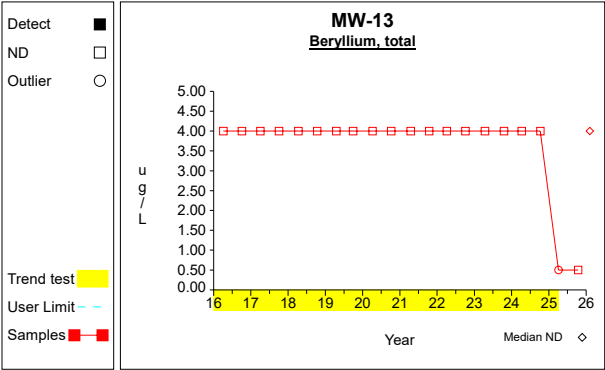
Graph 46



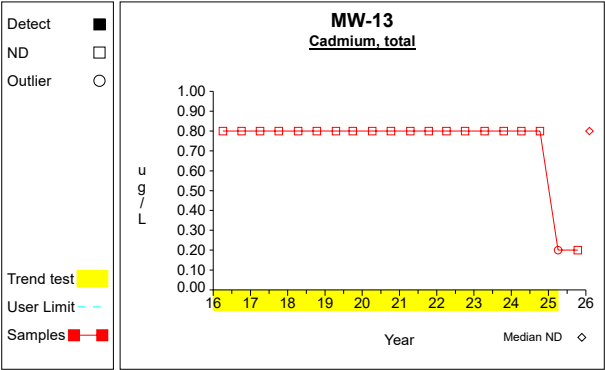
Graph 47



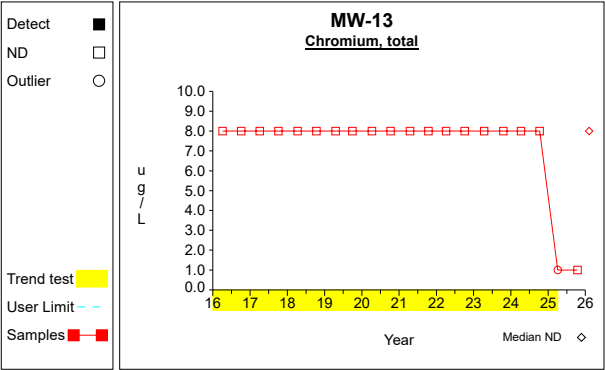
Graph 48



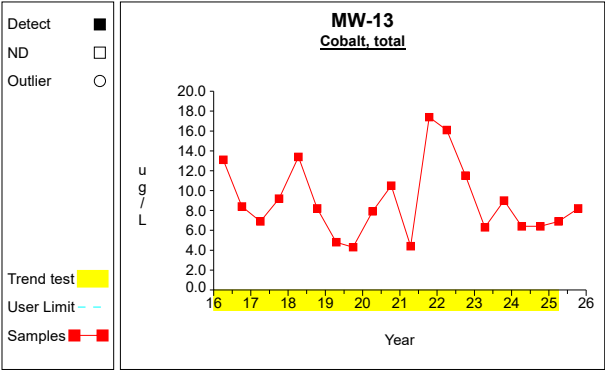
Graph 49



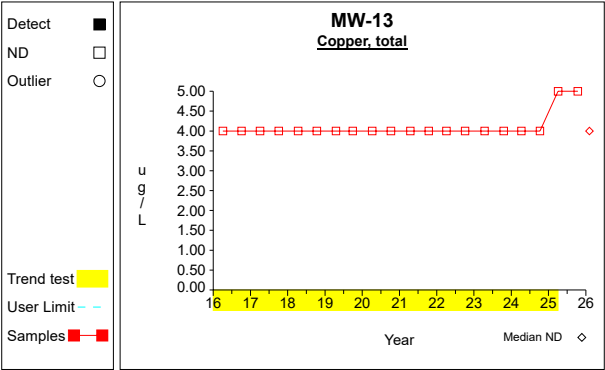
Graph 50



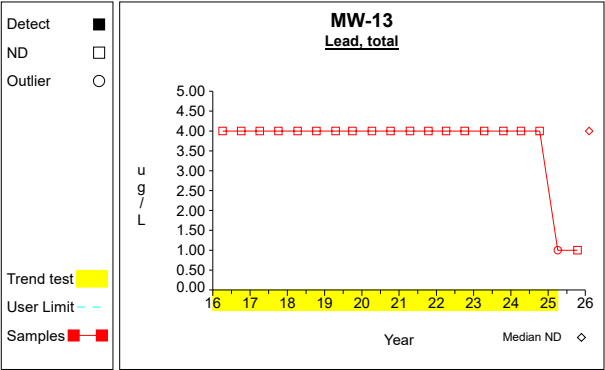
Graph 51



Graph 52

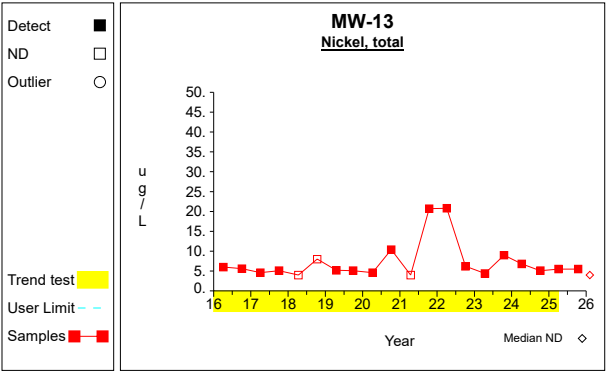


Graph 53

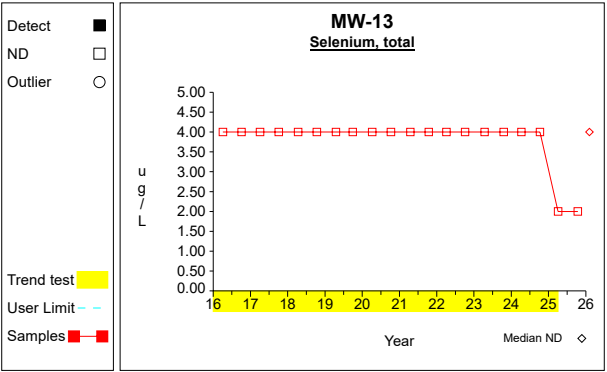


Graph 54

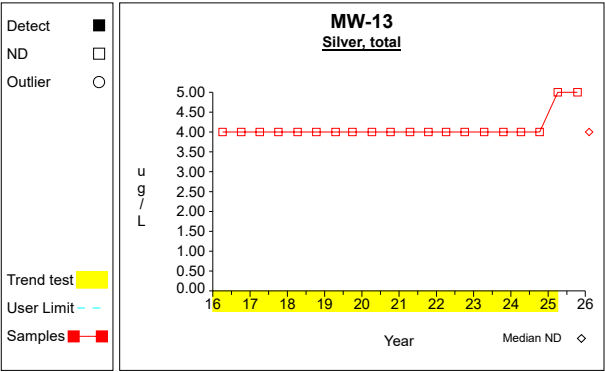
Time Series



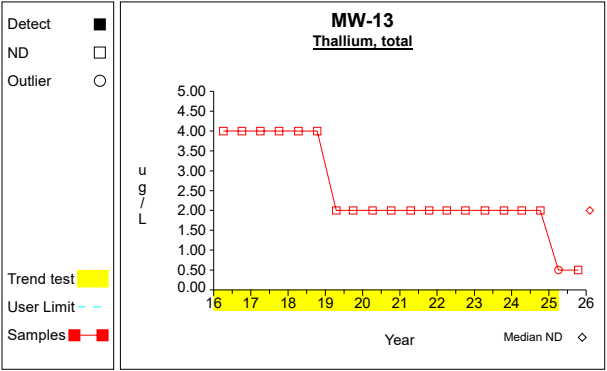
Graph 55



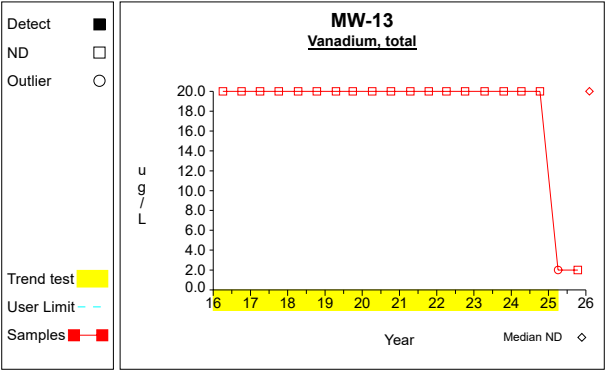
Graph 56



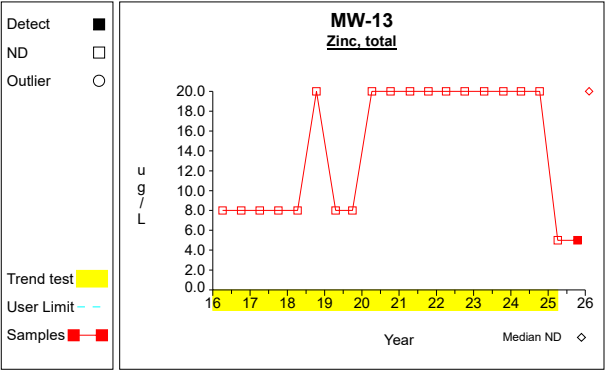
Graph 57



Graph 58

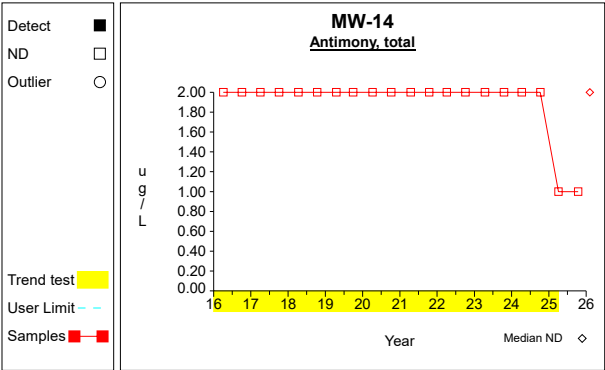


Graph 59

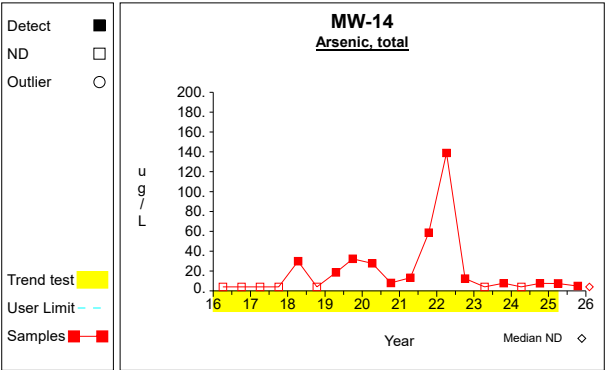


Graph 60

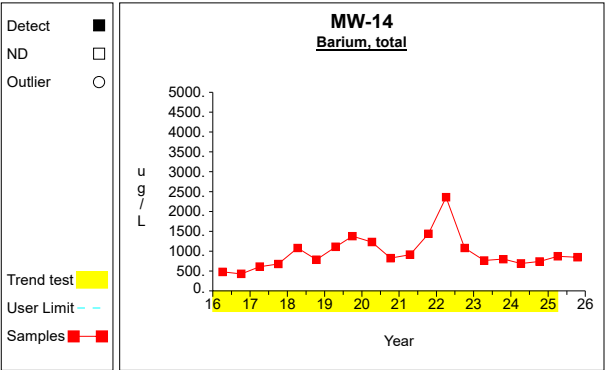
Time Series



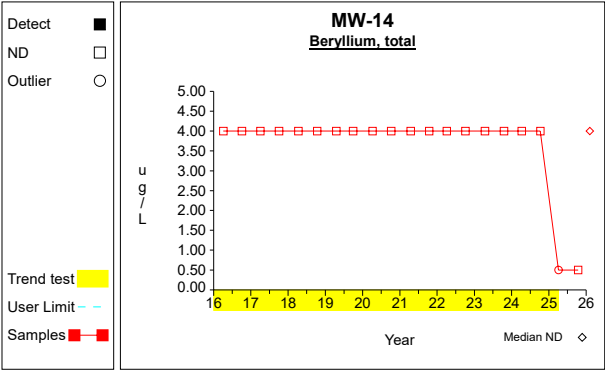
Graph 61



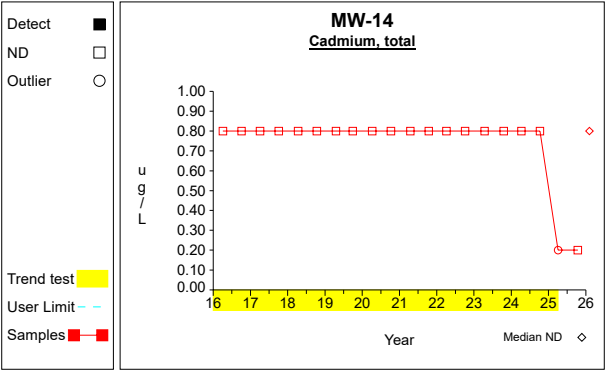
Graph 62



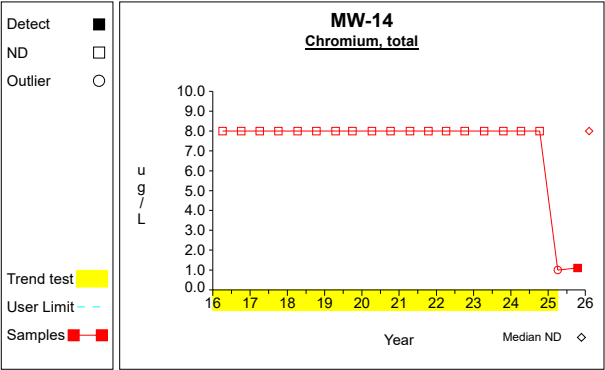
Graph 63



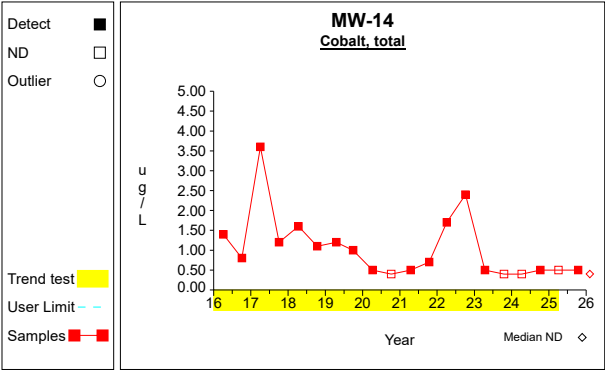
Graph 64



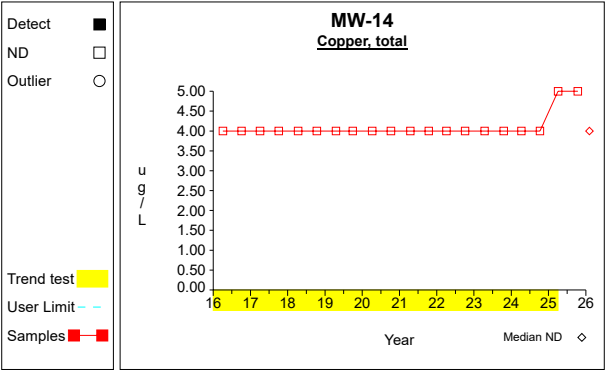
Graph 65



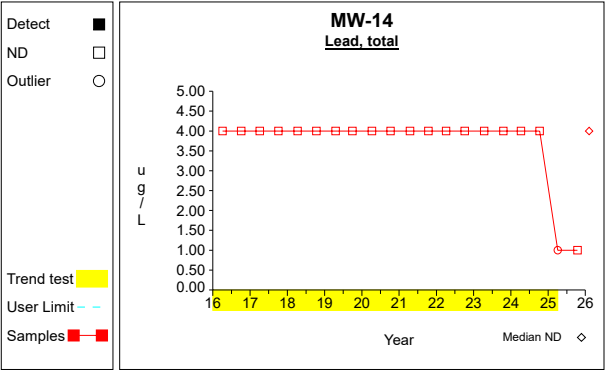
Graph 66



Graph 67

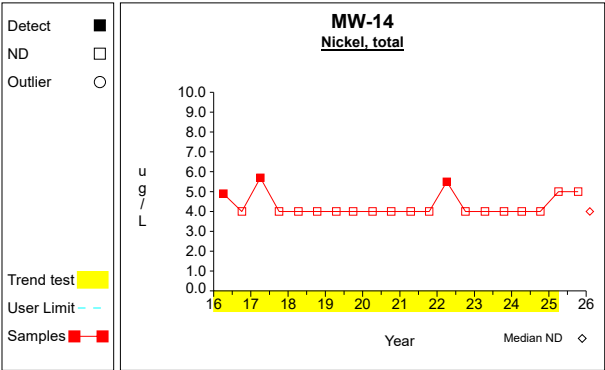


Graph 68

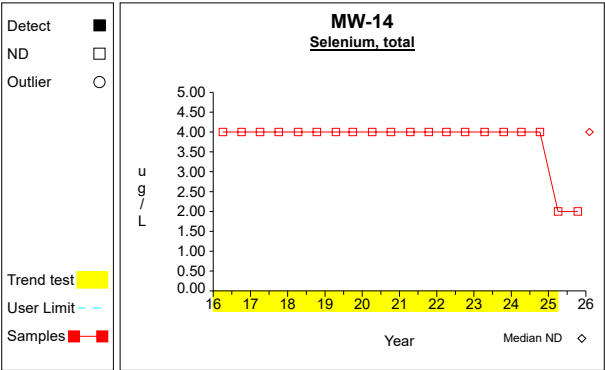


Graph 69

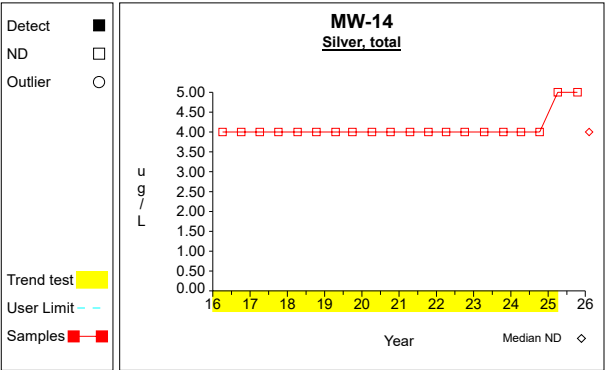
Time Series



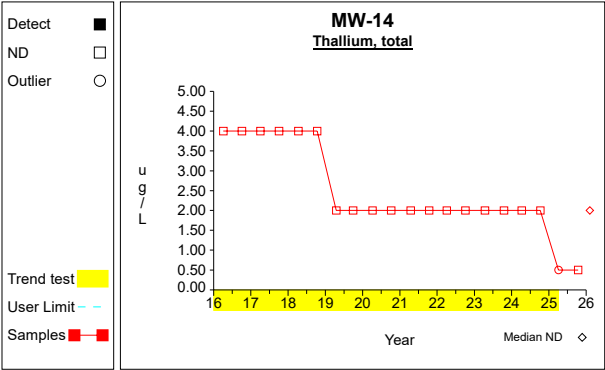
Graph 70



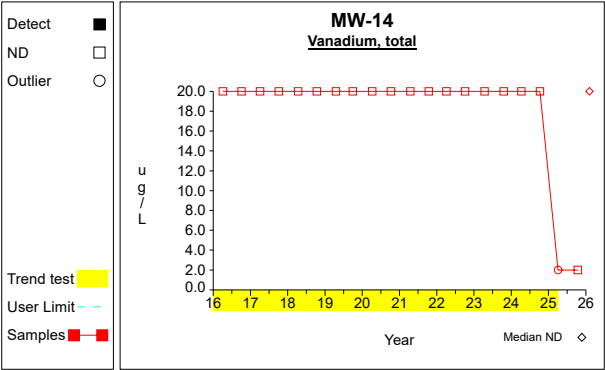
Graph 71



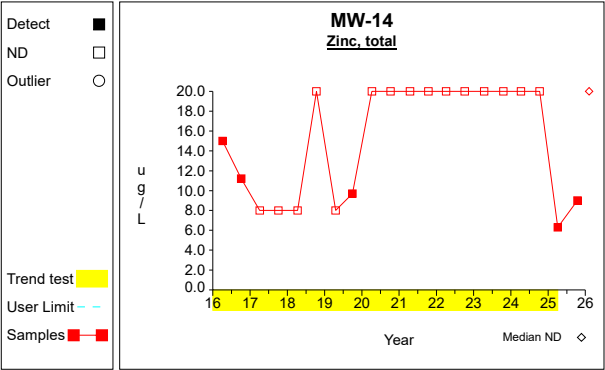
Graph 72



Graph 73

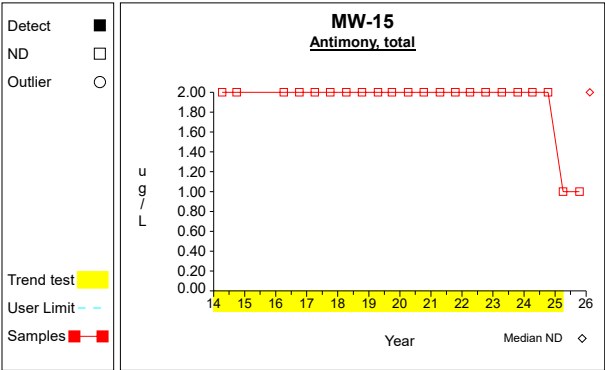


Graph 74

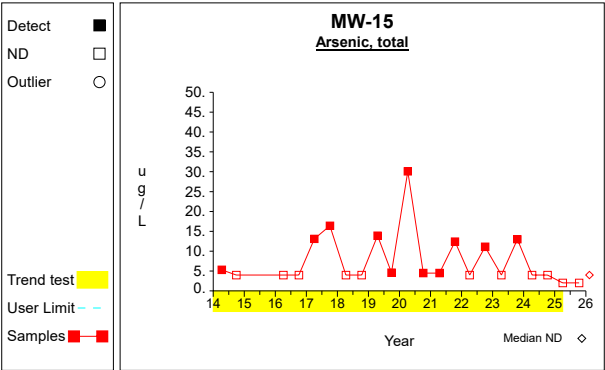


Graph 75

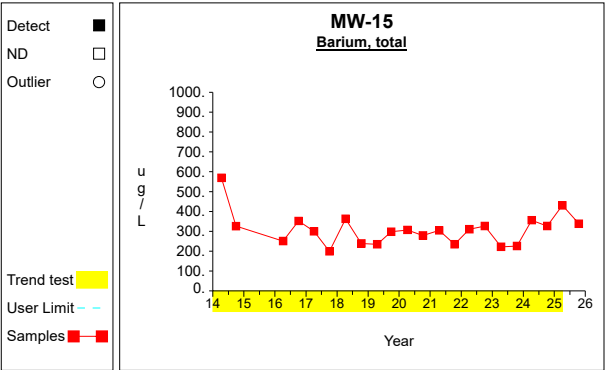
Time Series



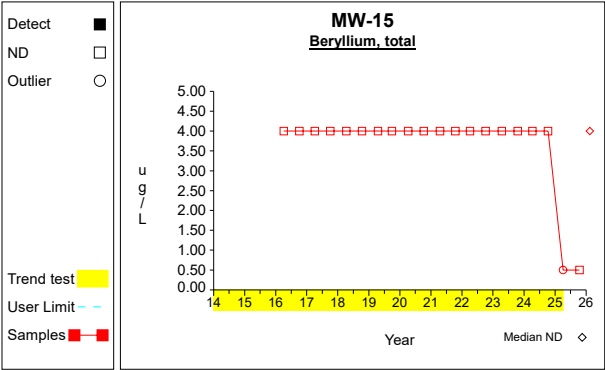
Graph 76



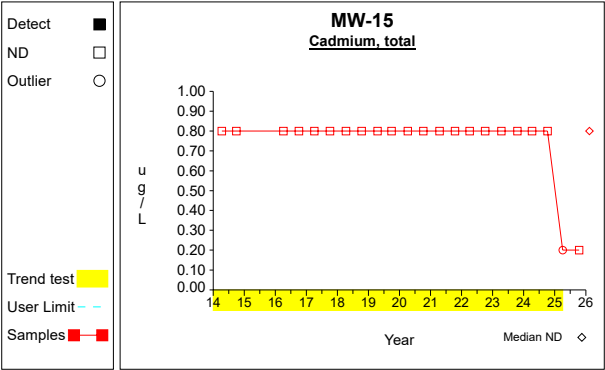
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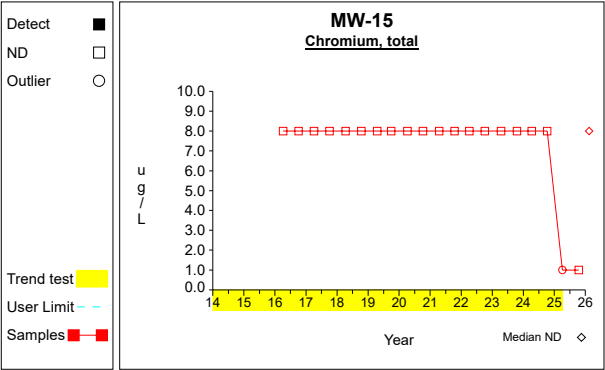
Graph 78



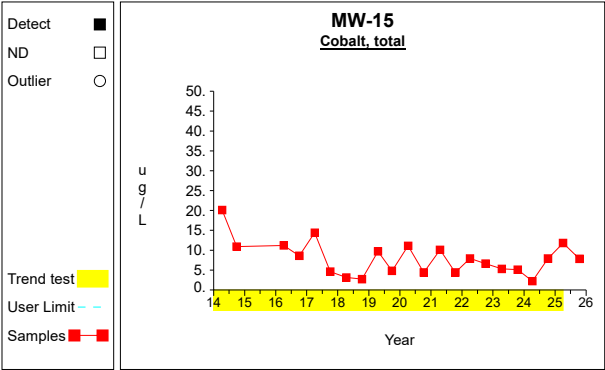
Graph 79



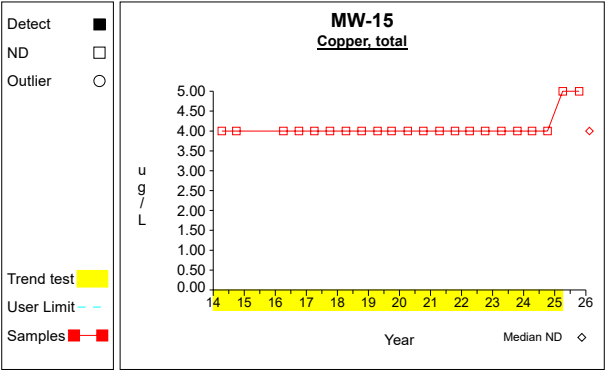
Graph 80



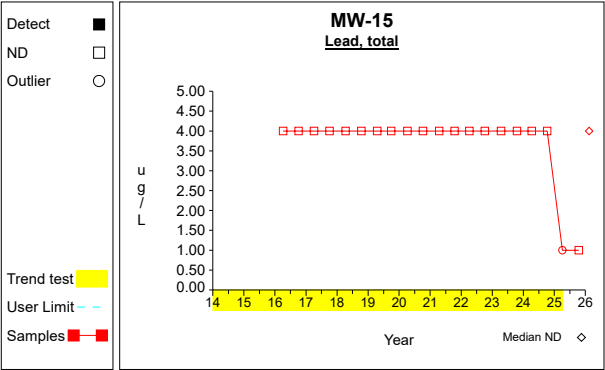
Graph 81



Graph 82

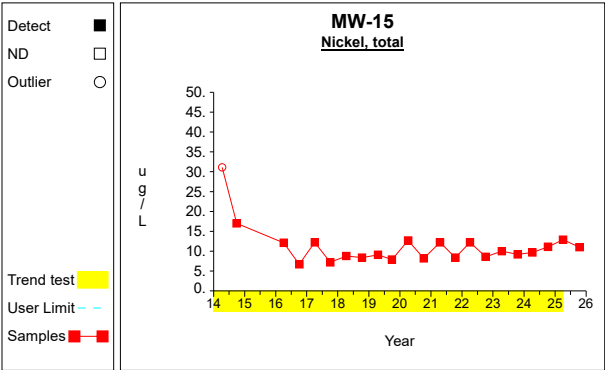


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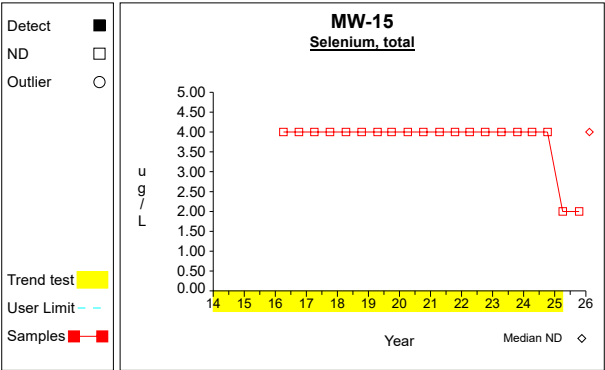


Graph 84

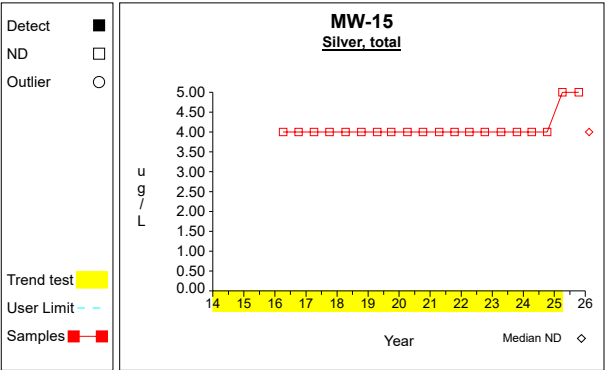
Time Series



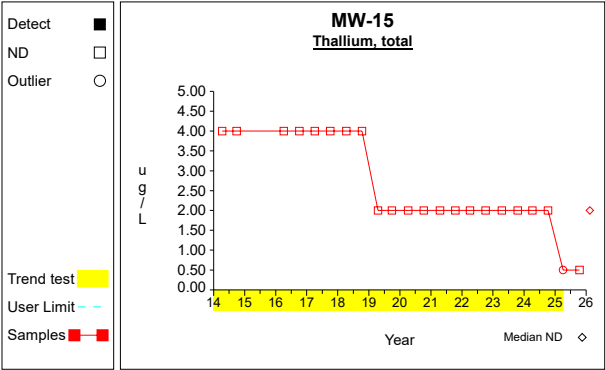
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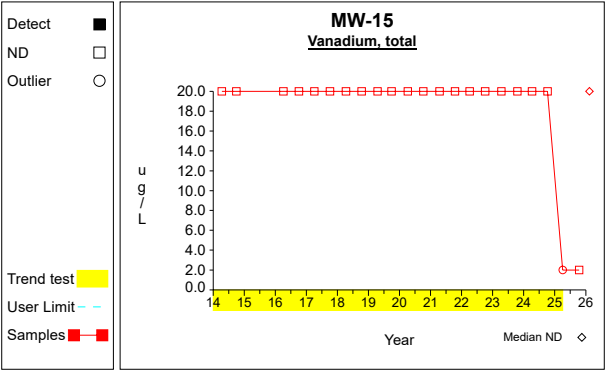
Graph 86



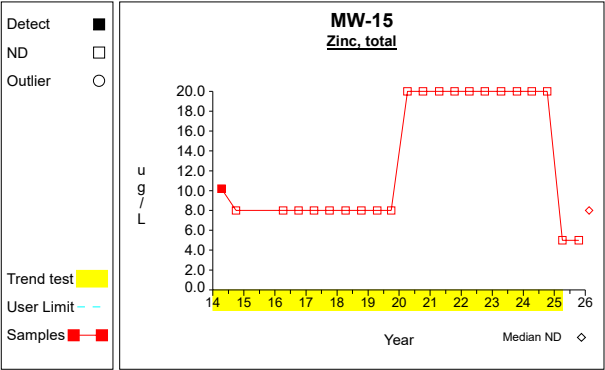
Graph 87



Graph 88

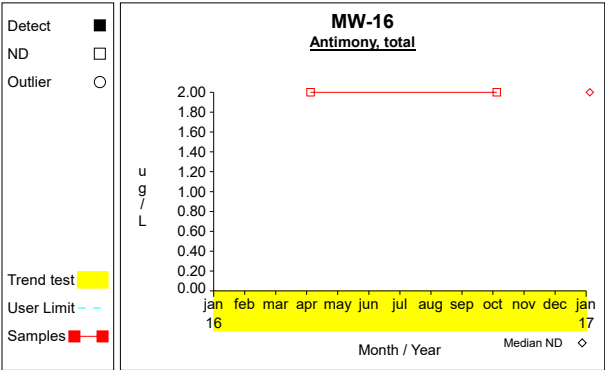


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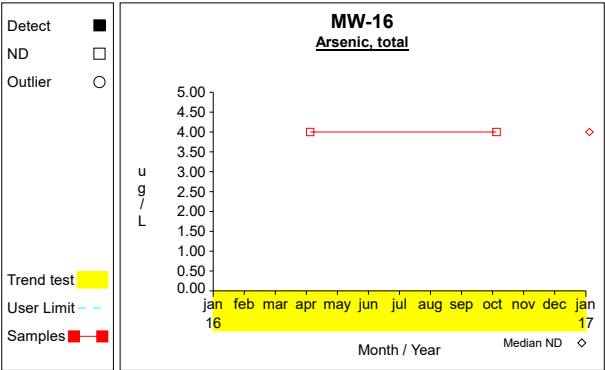


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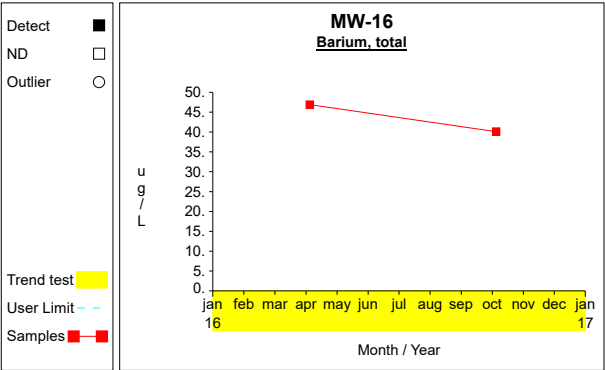
Time Series



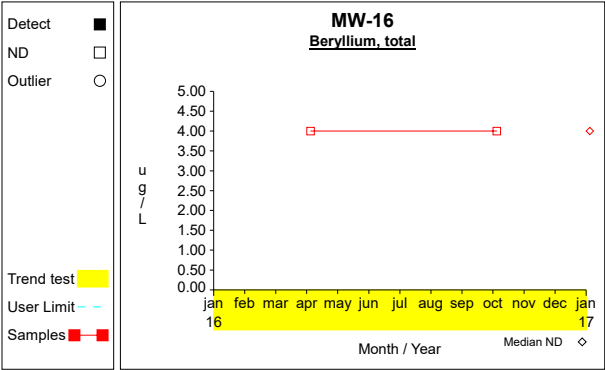
Graph 91



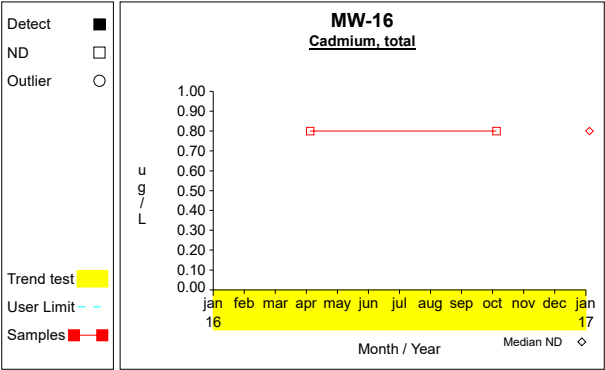
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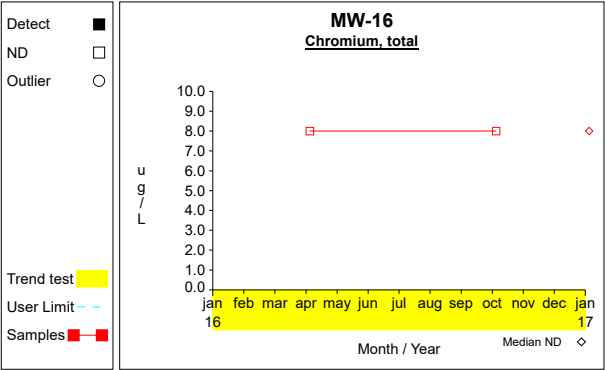
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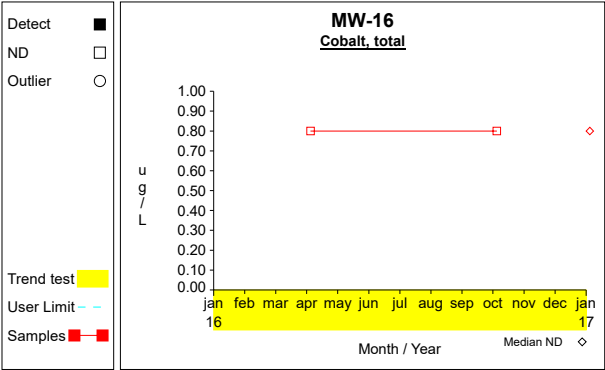
Graph 94



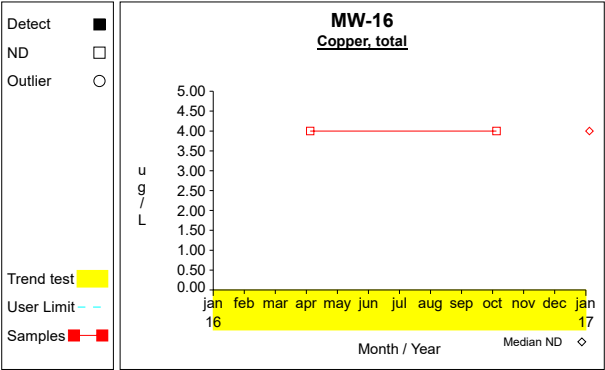
Graph 95



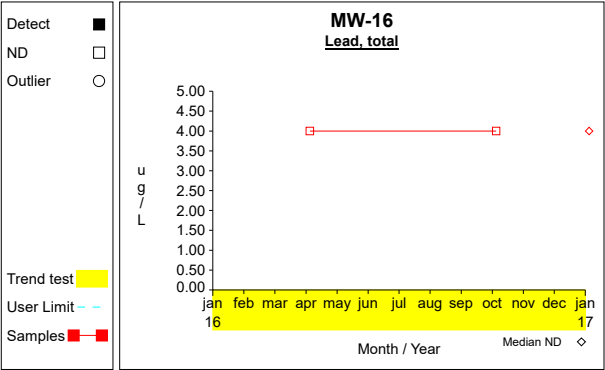
Graph 96



Graph 97

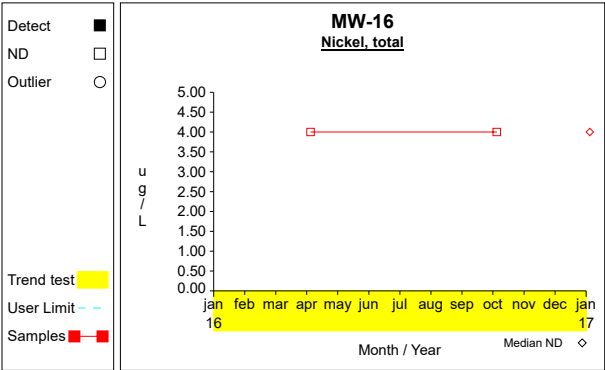


Graph 98

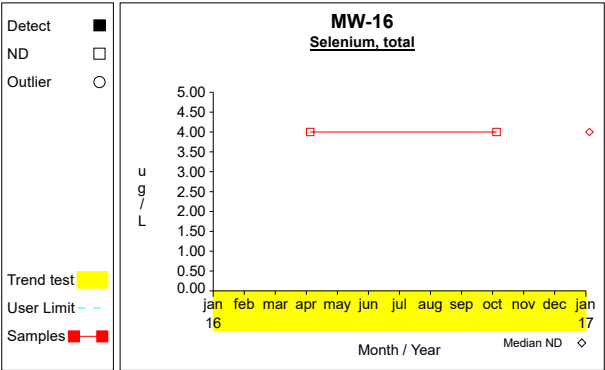


Graph 99

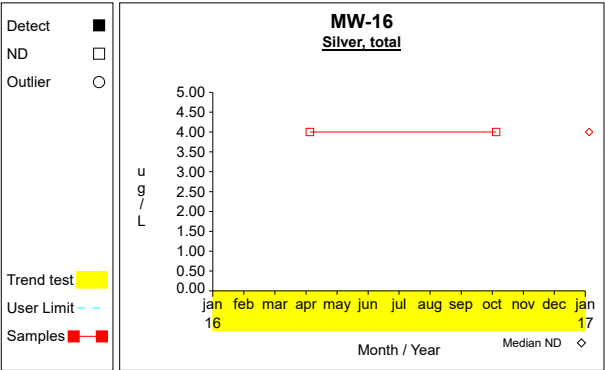
Time Series



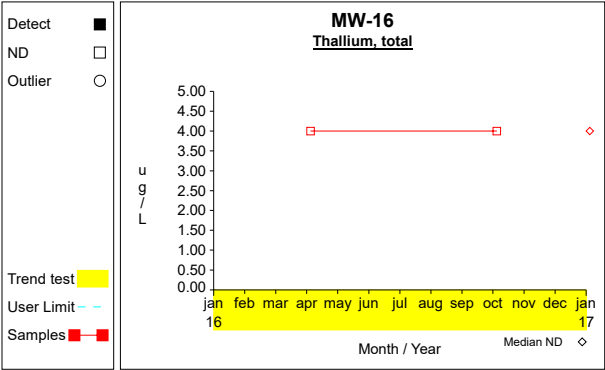
Graph 100



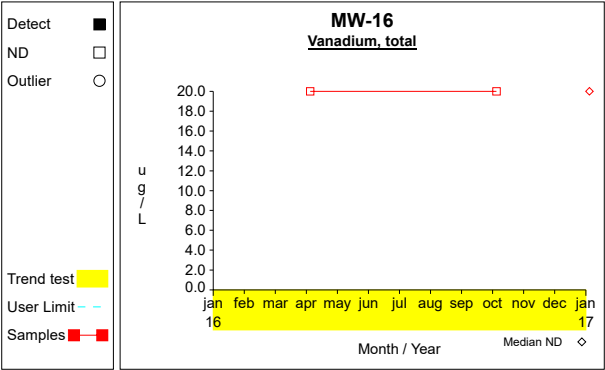
Graph 101



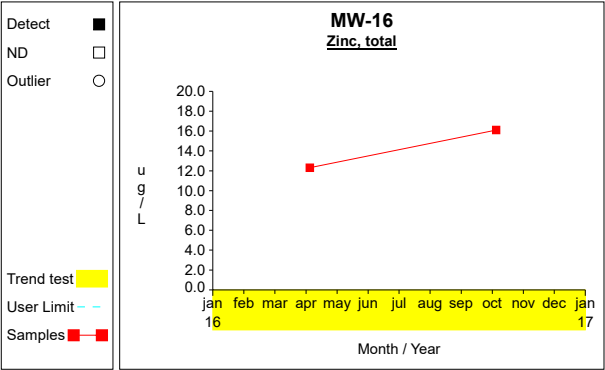
Graph 102



Graph 103

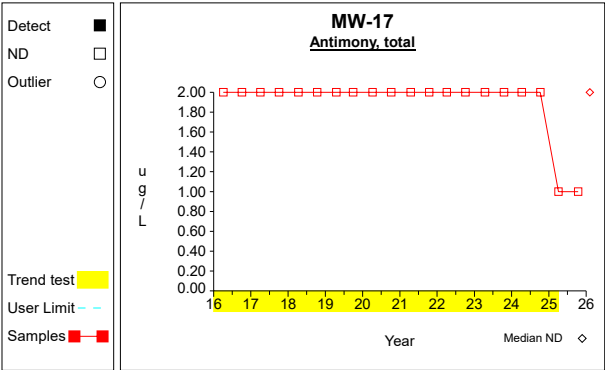


Graph 104

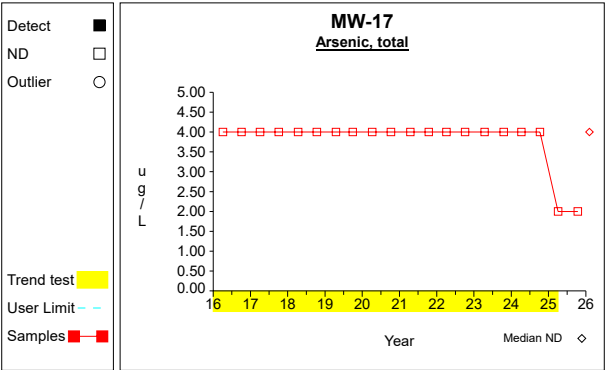


Graph 105

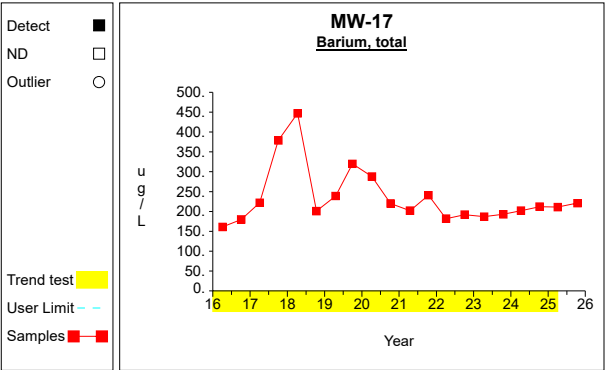
Time Series



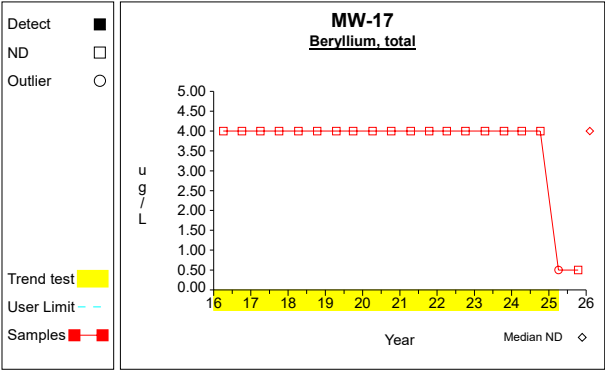
Graph 106



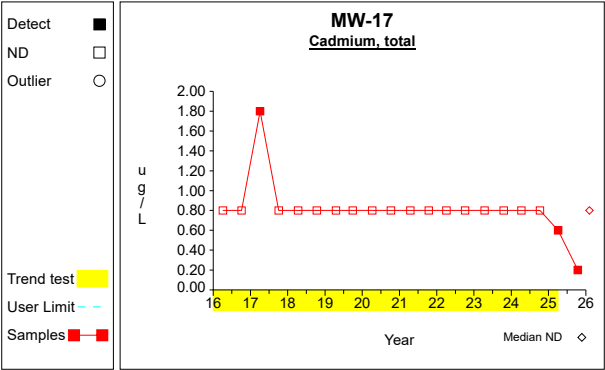
Graph 107



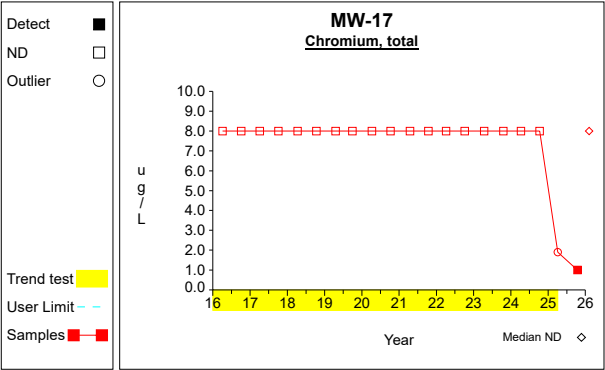
Graph 108



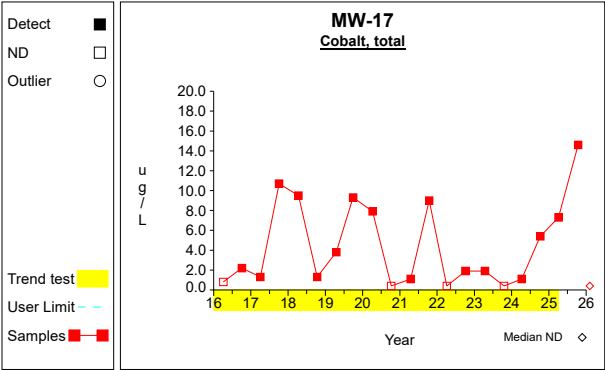
Graph 109



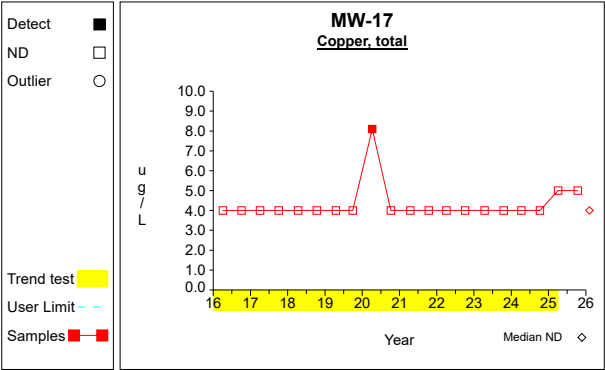
Graph 110



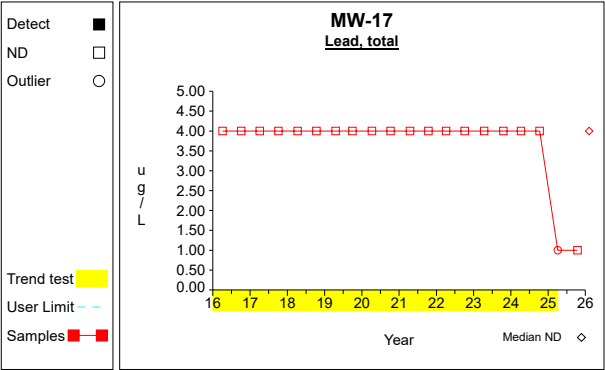
Graph 111



Graph 112

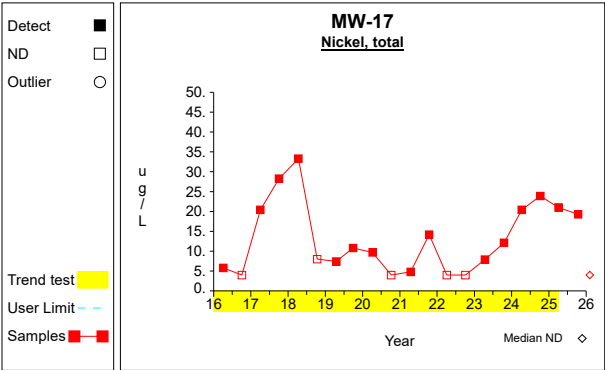


Graph 113

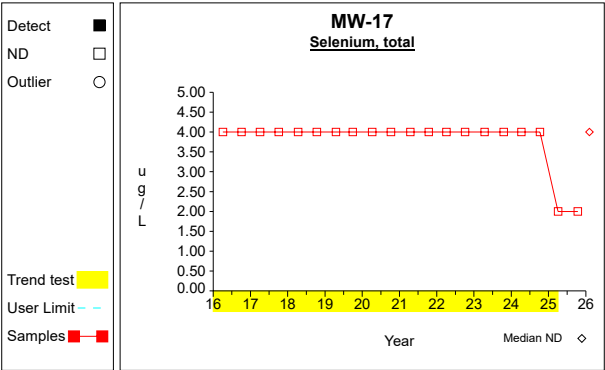


Graph 114

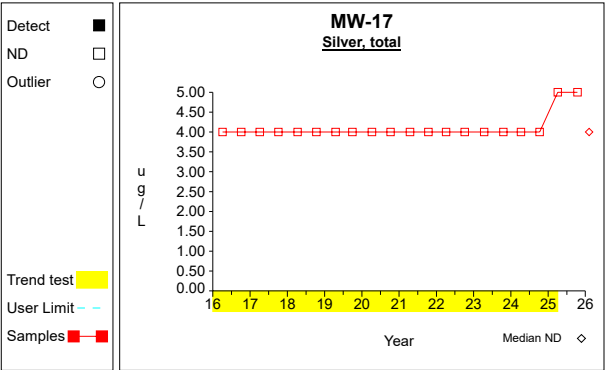
Time Series



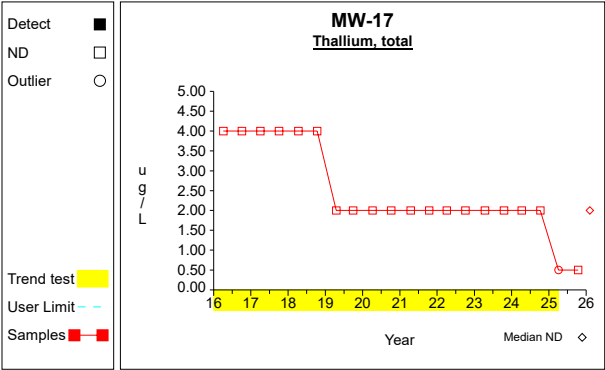
Graph 115



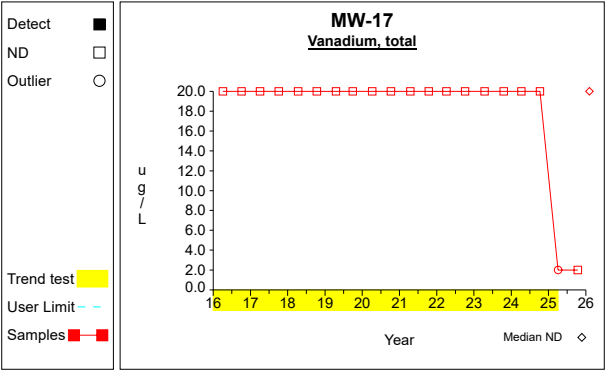
Graph 116



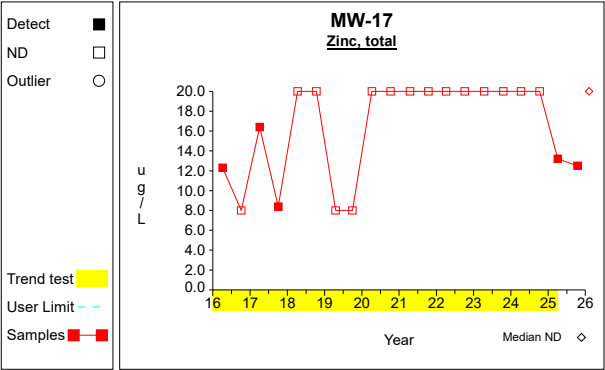
Graph 117



Graph 118

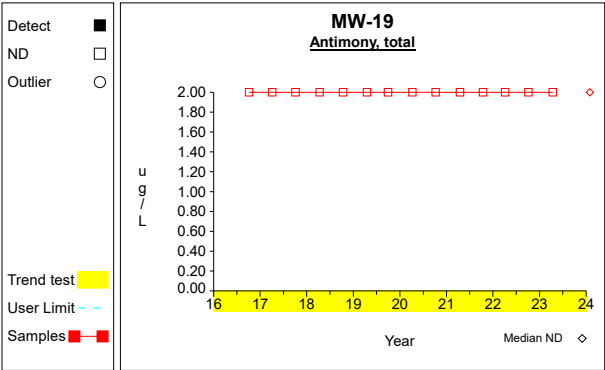


Graph 119

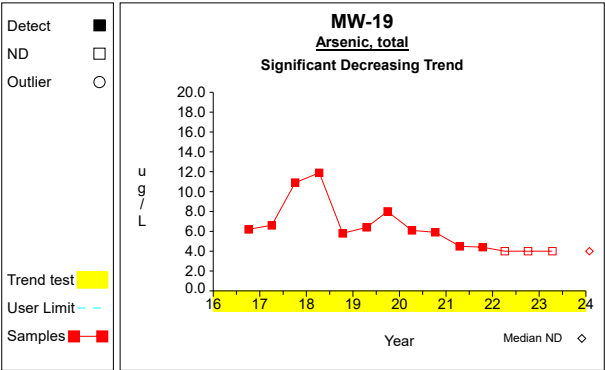


Graph 120

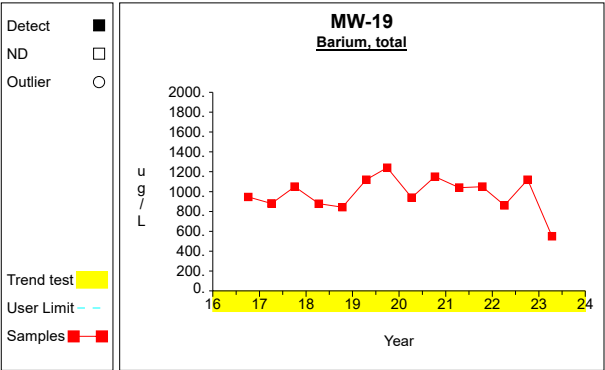
Time Series



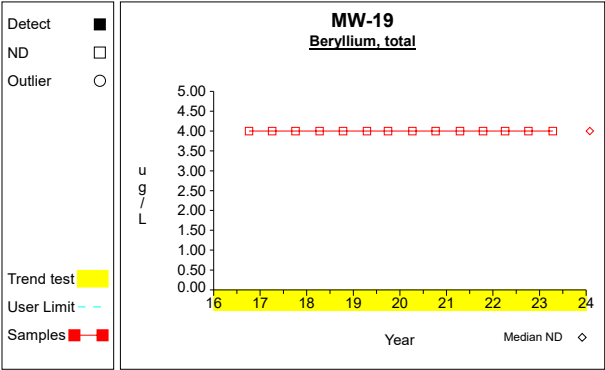
Graph 121



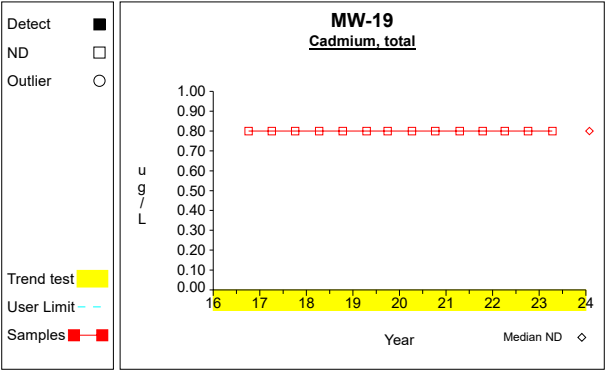
Graph 122



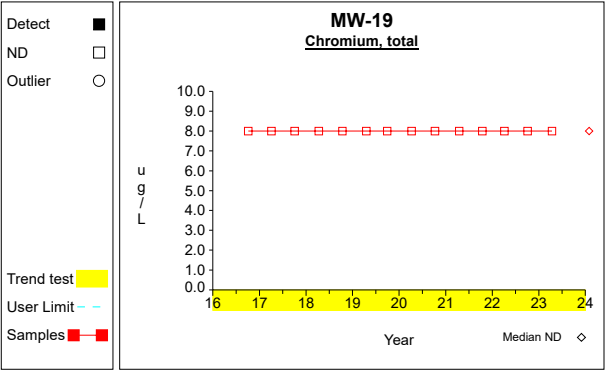
Graph 123



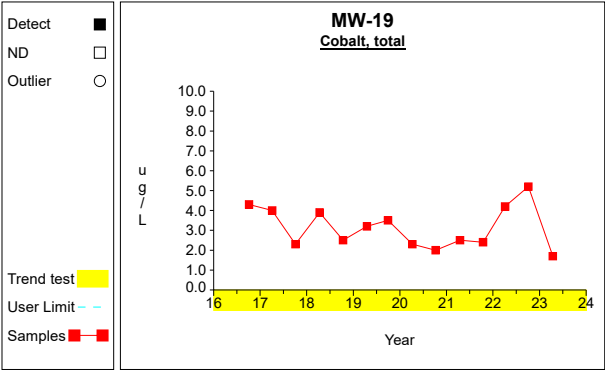
Graph 124



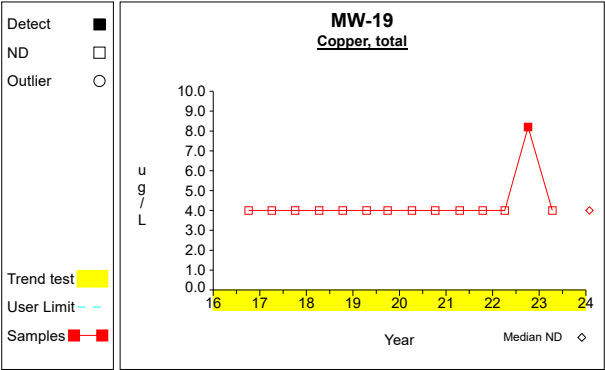
Graph 125



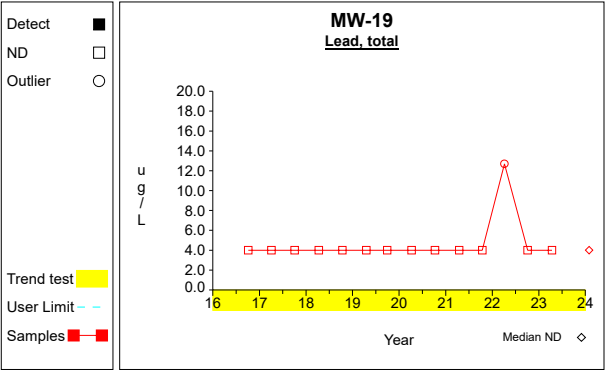
Graph 126



Graph 127

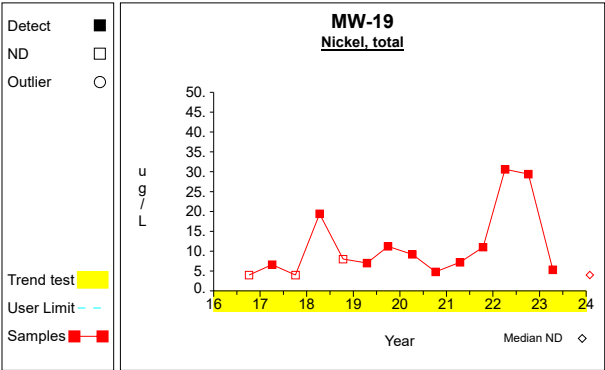


Graph 128

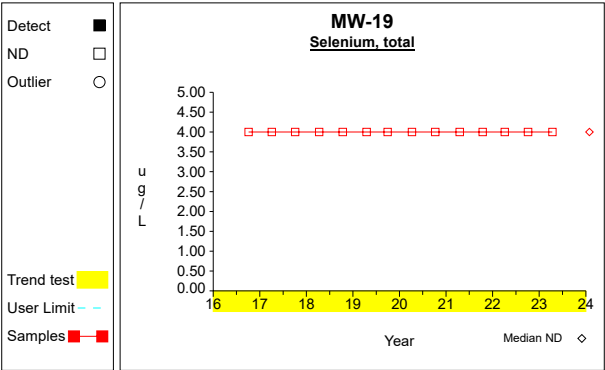


Graph 129

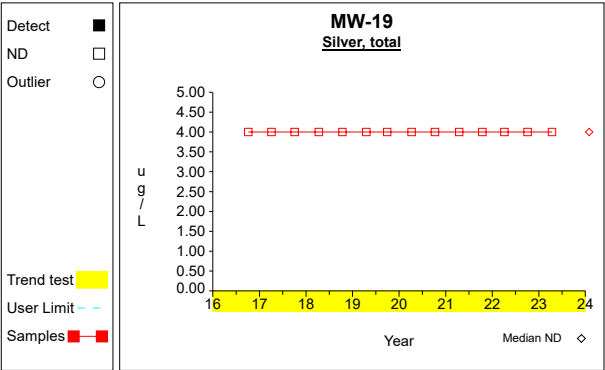
Time Series



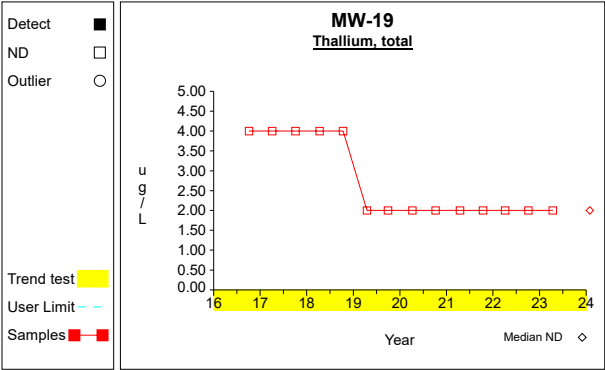
Graph 130



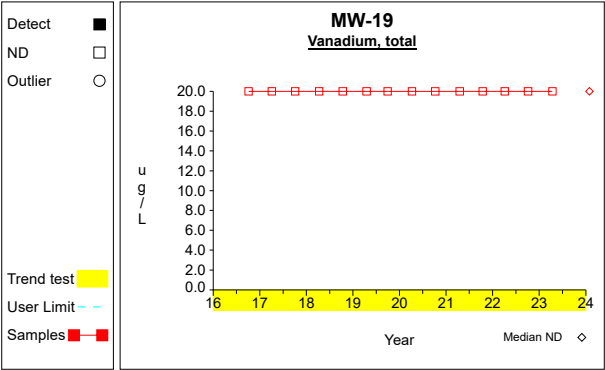
Graph 131



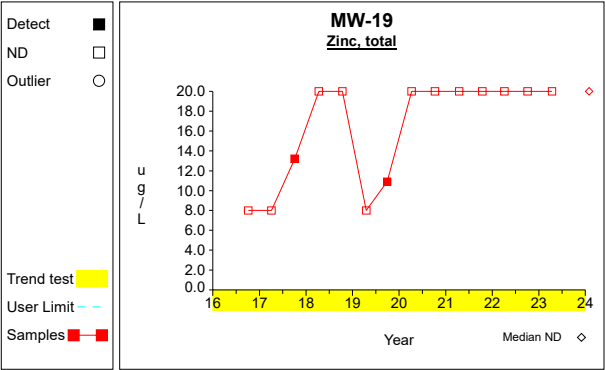
Graph 132



Graph 133

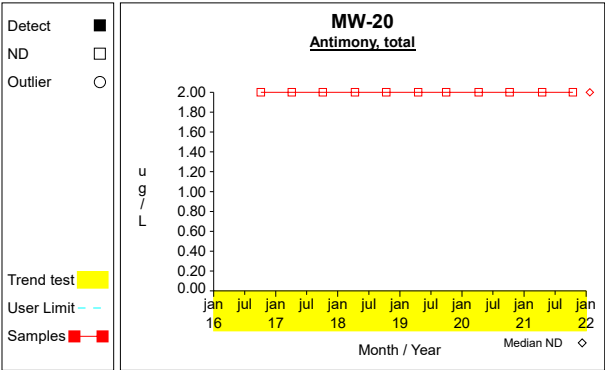


Graph 134

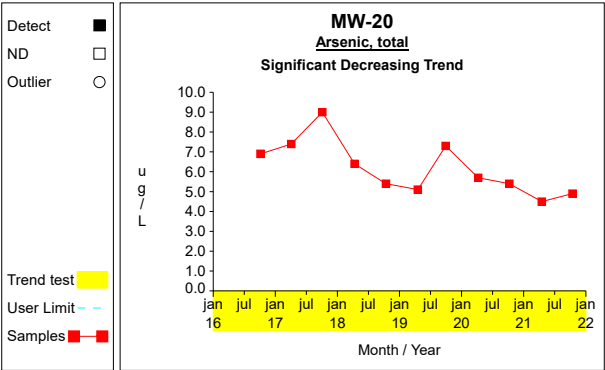


Graph 135

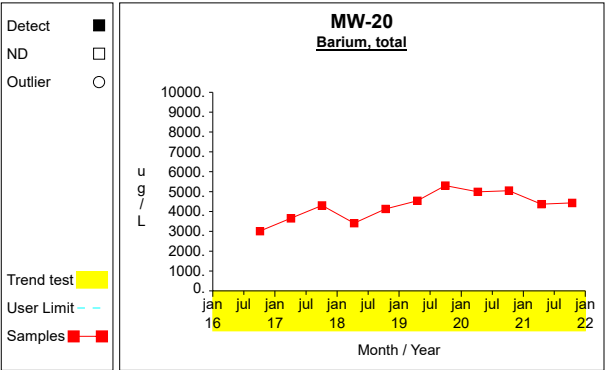
Time Series



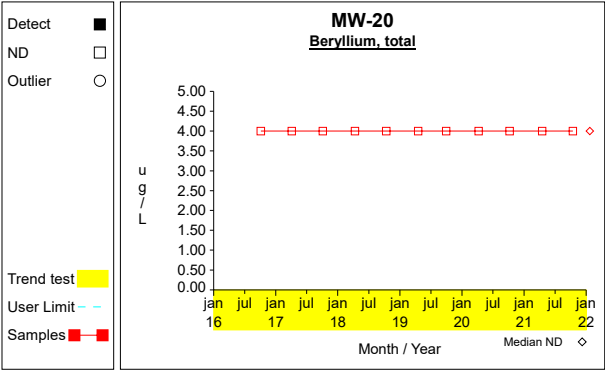
Graph 136



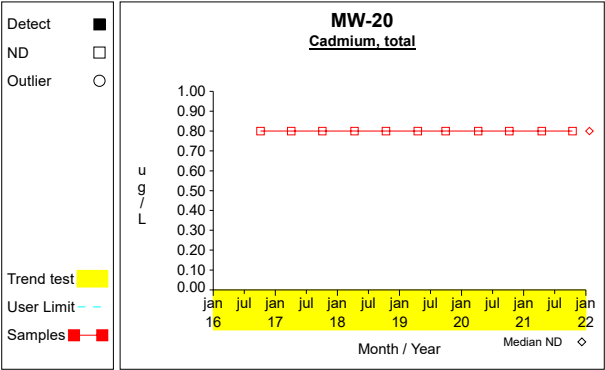
Graph 137



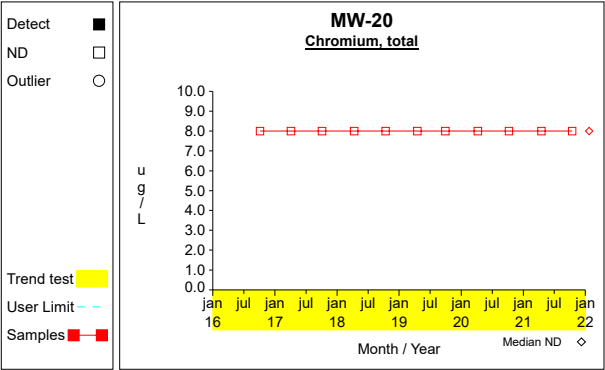
Graph 138



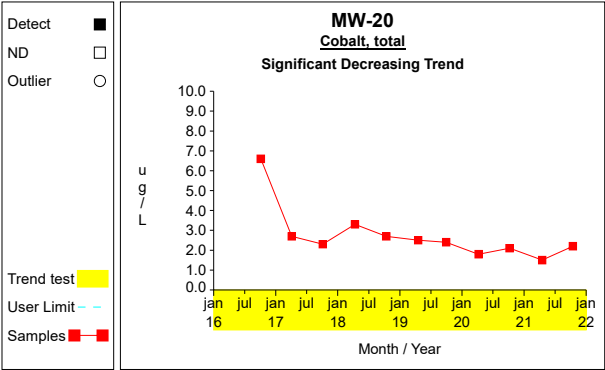
Graph 139



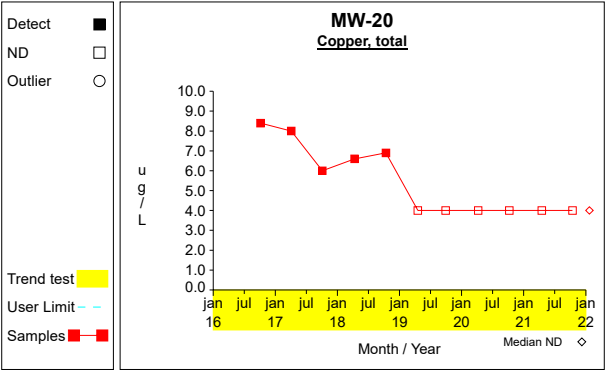
Graph 140



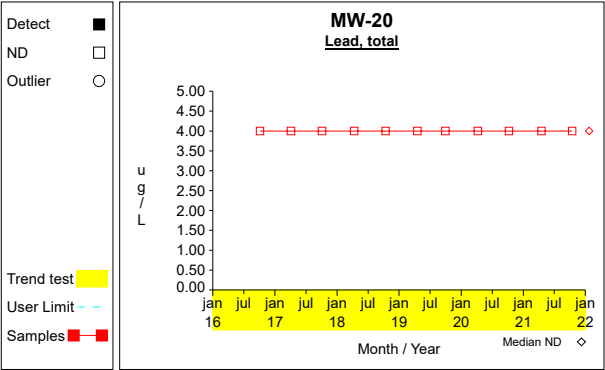
Graph 141



Graph 142

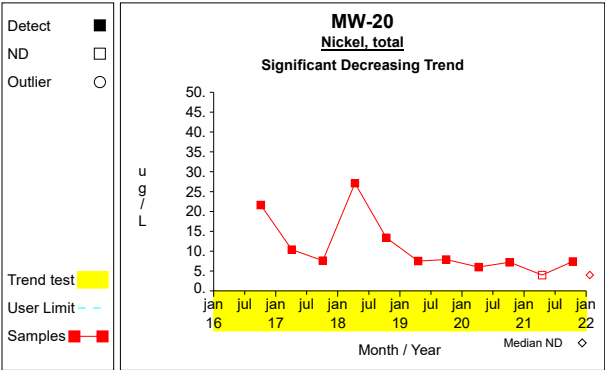


Graph 143

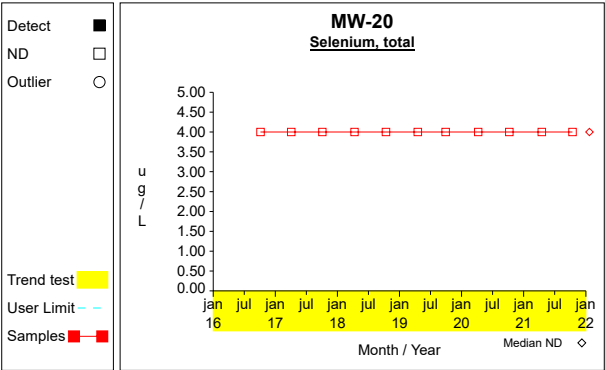


Graph 144

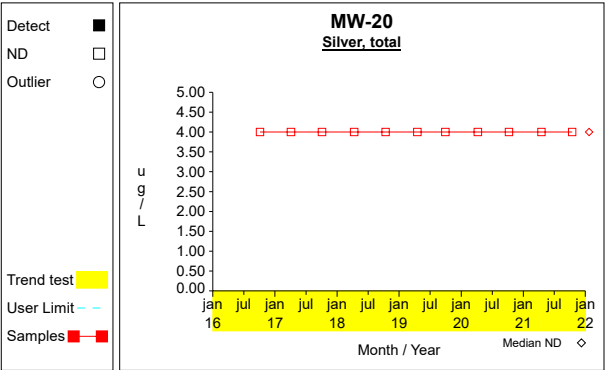
Time Series



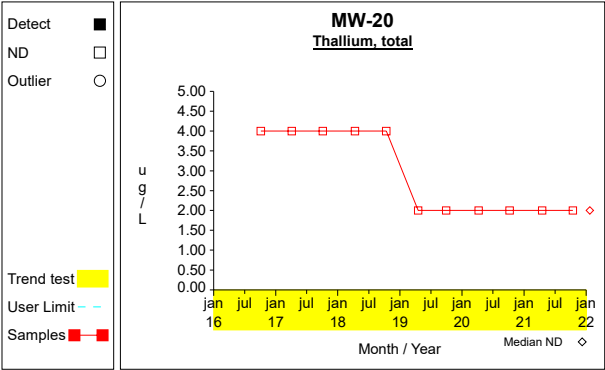
Graph 145



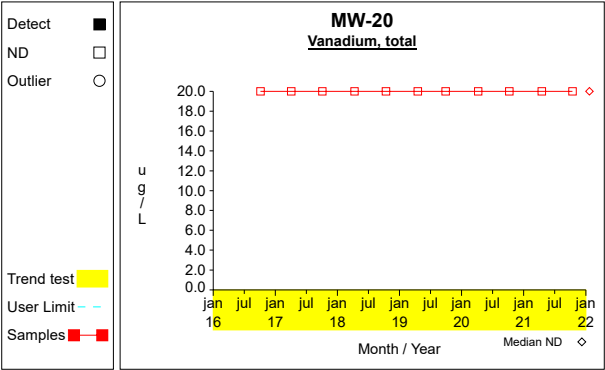
Graph 146



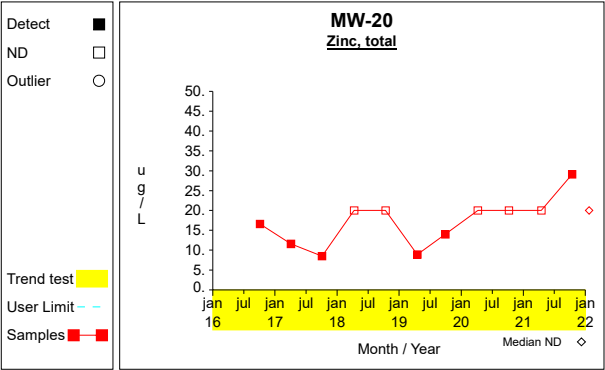
Graph 147



Graph 148

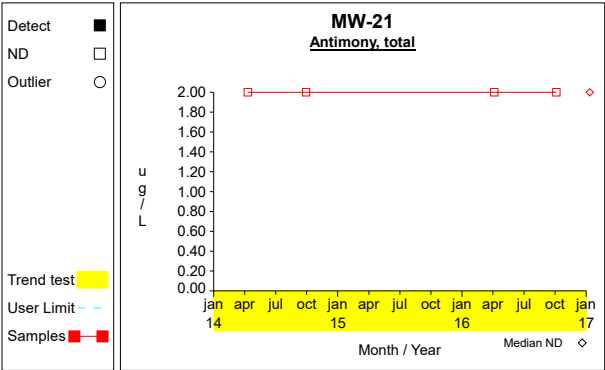


Graph 149

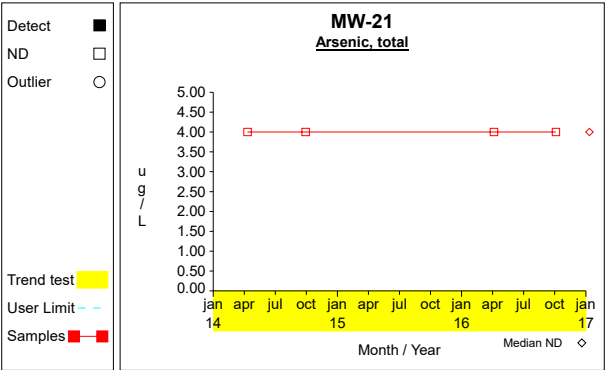


Graph 150

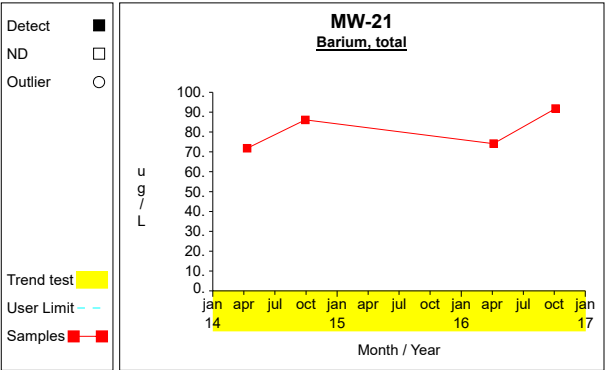
Time Series



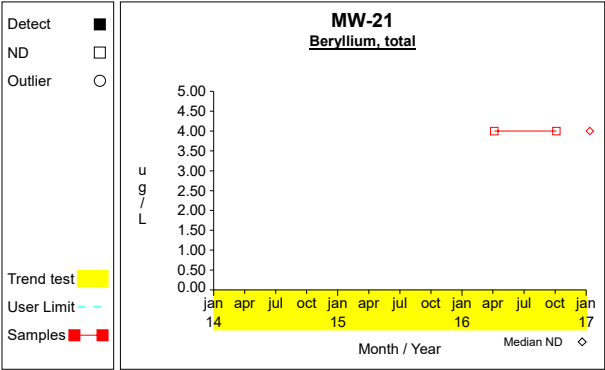
Graph 151



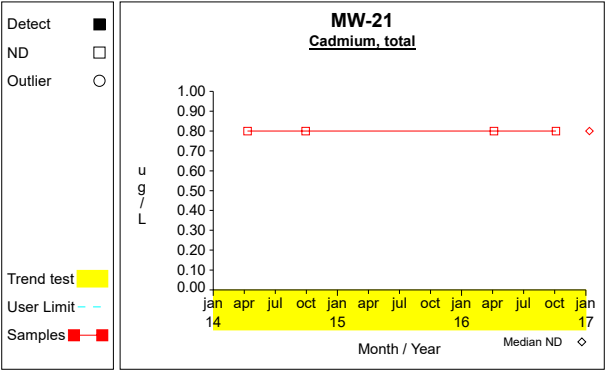
Graph 152



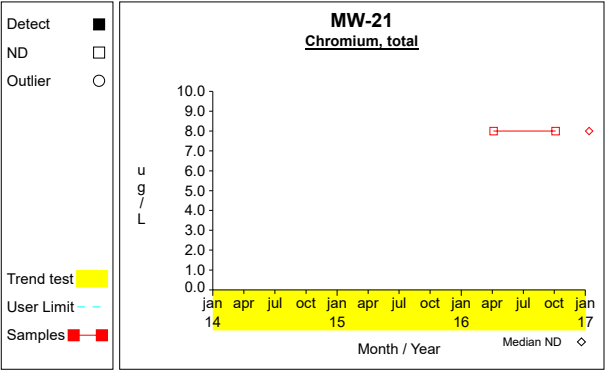
Graph 153



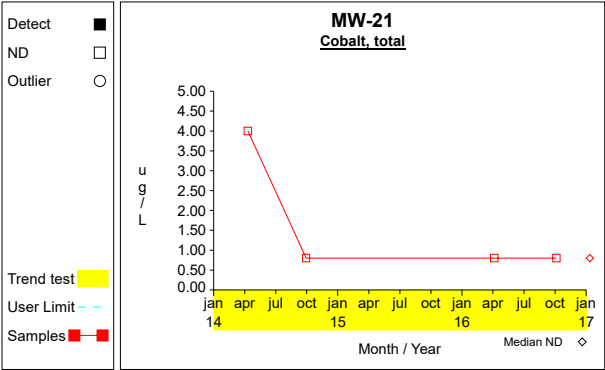
Graph 154



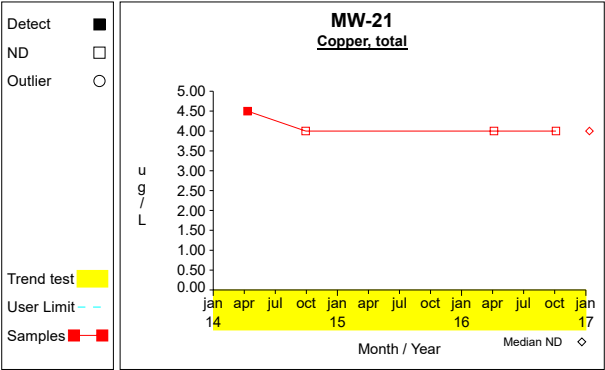
Graph 155



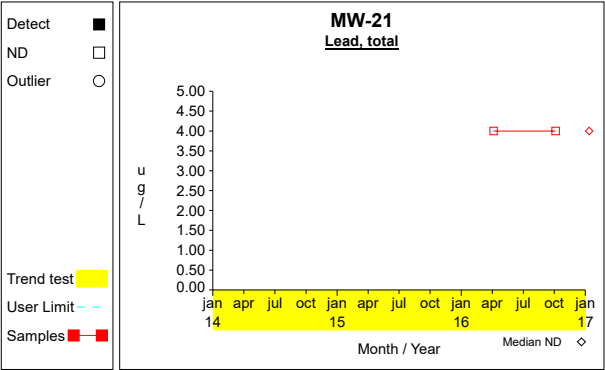
Graph 156



Graph 157

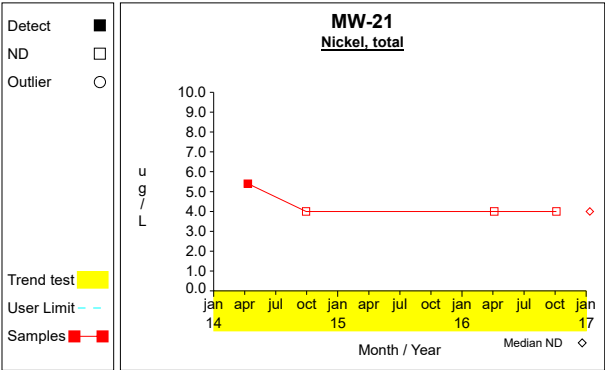


Graph 158

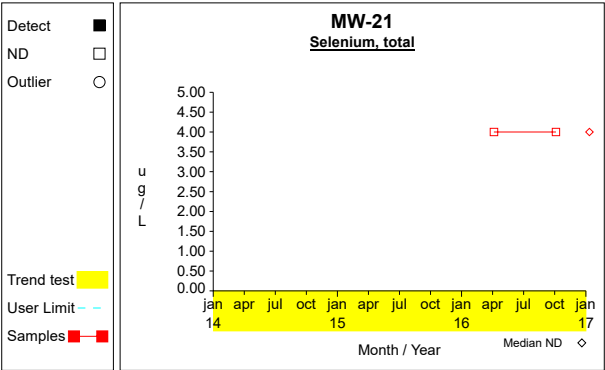


Graph 159

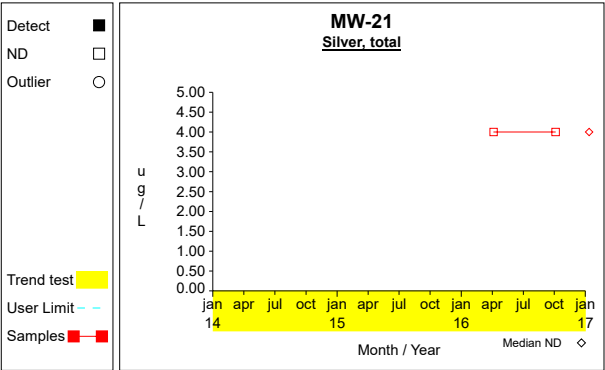
Time Series



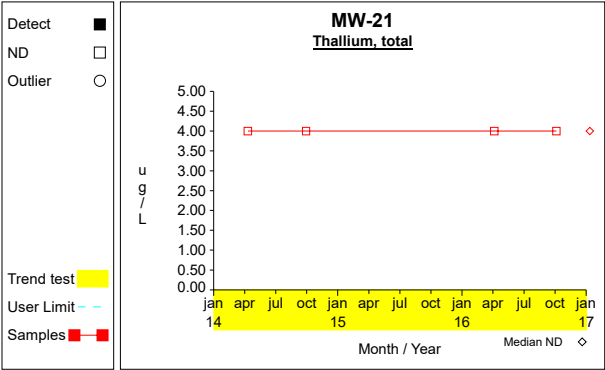
Graph 160



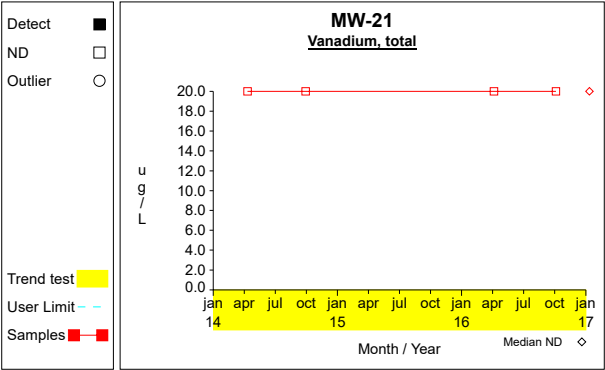
Graph 161



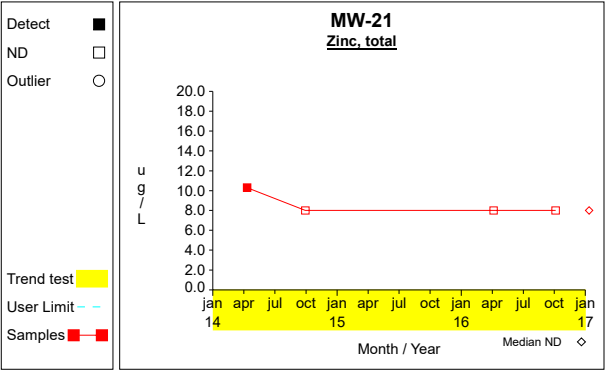
Graph 162



Graph 163



Graph 164



Graph 165

Attachment E

Statistics for Trace Metals

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Antimony, total	ug/L	MW-10	19	1	20	91.1053	6.7685	2.0000	1.0000		91.1053	2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-10	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-10	19	1	20			94.4000	90.7000			135.1006	normal		
Beryllium, total	ug/L	MW-10	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-10	18	1	20			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-10	18	1	20			1.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-10	18	1	20			0.5000	0.5000			0.5000	nonpar	.99	**
Copper, total	ug/L	MW-10	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-10	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-10	19	1	20			4.0000	5.0000			8.9000	nonpar	.99	**
Selenium, total	ug/L	MW-10	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-10	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-10	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-10	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-10	19	1	20			20.0000	5.0000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-11	19	1	20	97.2053	10.2426	2.0000	1.0000		97.2053	2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-11	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-11	19	1	20			107.0000	104.0000			163.7824	normal		
Beryllium, total	ug/L	MW-11	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-11	18	1	20			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-11	18	1	20			1.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-11	18	1	20			0.4000	0.5000			1.3000	nonpar	.99	**
Copper, total	ug/L	MW-11	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-11	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-11	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Selenium, total	ug/L	MW-11	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-11	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-11	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-11	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-11	17	1	20	18.9706	5.9611	15.0000	10.8000		18.9706	57.7177	normal		
Antimony, total	ug/L	MW-12	19	1	20	398.8421	112.2731	2.0000	1.6000		398.8421	2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-12	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Barium, total	ug/L	MW-12	19	1	20			329.0000	330.0000			1128.6173	normal		
Beryllium, total	ug/L	MW-12	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-12	18	1	20			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-12	18	1	20			1.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-12	18	1	20			1.1000	1.1000			11.4542	normal		
Copper, total	ug/L	MW-12	19	1	20			4.0000	11.8000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-12	18	1	20			1.0000	2.6000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-12	19	1	20			4.0000	5.0000			15.1707	normal		
Selenium, total	ug/L	MW-12	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-12	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-12	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-12	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-12	19	1	20			8.8000	24.4000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-13	19	1	20			2.0000	1.0000			2.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Arsenic, total	ug/L	MW-13	19	1	20	17.9789	7.3066	8.6000	10.2000		17.9789	65.4718	normal		
Barium, total	ug/L	MW-13	19	1	20	1981.5263	1308.6254	528.0000	562.0000		1981.5263	10487.5913	normal		
Beryllium, total	ug/L	MW-13	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-13	18	1	20			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-13	18	1	20			1.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-13	19	1	20	9.0053	3.7889	6.9000	8.2000		9.0053	33.6334	normal		
Copper, total	ug/L	MW-13	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-13	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-13	19	1	20	7.2158	5.0445	5.5000	5.5000		7.2158	40.0050	normal		
Selenium, total	ug/L	MW-13	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-13	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-13	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-13	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-13	19	1	20			20.0000	5.0000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-14	19	1	20			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-14	19	1	20	20.5737	32.0269	7.5000	5.0000		20.5737	228.7484	normal		
Barium, total	ug/L	MW-14	19	1	20	961.3158	437.9026	873.0000	849.0000		961.3158	3807.6826	normal		
Beryllium, total	ug/L	MW-14	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-14	18	1	20			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-14	18	1	20			1.0000	1.1000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-14	19	1	20	1.0684	0.8267	0.4000	0.5000		1.0684	6.4418	normal		
Copper, total	ug/L	MW-14	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-14	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-14	19	1	20			4.0000	5.0000			5.7000	nonpar	.99	**
Selenium, total	ug/L	MW-14	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-14	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-14	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-14	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-14	19	1	20			6.3000	9.0000			20.0000	nonpar	.99	**
Antimony, total	ug/L	MW-15	21	1	23			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-15	21	1	23	8.0429	6.6222	4.0000	2.0000		8.0429	51.0872	normal		
Barium, total	ug/L	MW-15	21	1	23	307.5238	82.8400	431.0000	338.0000		307.5238	845.9837	normal		
Beryllium, total	ug/L	MW-15	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-15	20	1	23			0.2000	0.2000			0.8000	nonpar	.99	**
Chromium, total	ug/L	MW-15	18	1	20			1.0000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-15	21	1	23	7.9476	4.4092	11.8000	7.8000		7.9476	36.6071	normal		
Copper, total	ug/L	MW-15	21	1	23			4.0000	5.0000			4.0000	nonpar	.99	**
Lead, total	ug/L	MW-15	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-15	20	1	23	10.2300	2.5154	12.9000	11.0000		10.2300	26.5804	normal		
Selenium, total	ug/L	MW-15	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-15	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-15	20	1	23			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-15	20	1	23			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-15	21	1	23			8.0000	5.0000			10.2000	nonpar	.99	**
Antimony, total	ug/L	MW-17	19	1	20			2.0000	1.0000			2.0000	nonpar	.99	**
Arsenic, total	ug/L	MW-17	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 1

**Summary Statistics and Intermediate Computations
for Combined Shewhart-CUSUM Control Charts**

Constituent	Units	Well	N(back)	N(mon)	N(tot)	Mean	SD	R(i-1)	R(i)	S(i-1)	S(i)	Limit	Type	Conf	
Barium, total	ug/L	MW-17	19	1	20	235.7368	73.7171	211.0000	221.0000		235.7368	714.8977	normal		
Beryllium, total	ug/L	MW-17	18	1	20			0.5000	0.5000			4.0000	nonpar	.99	**
Cadmium, total	ug/L	MW-17	19	1	20			0.6000	0.2000			1.8000	nonpar	.99	**
Chromium, total	ug/L	MW-17	18	1	20			1.9000	1.0000			8.0000	nonpar	.99	**
Cobalt, total	ug/L	MW-17	19	1	20	3.9632	3.7387	7.3000	14.6000		11.7960	28.2648	normal		
Copper, total	ug/L	MW-17	19	1	20			4.0000	5.0000			8.1000	nonpar	.99	**
Lead, total	ug/L	MW-17	18	1	20			1.0000	1.0000			4.0000	nonpar	.99	**
Nickel, total	ug/L	MW-17	19	1	20	12.6316	9.2357	21.0000	19.3000		12.6316	72.6635	normal		
Selenium, total	ug/L	MW-17	19	1	20			4.0000	2.0000			4.0000	nonpar	.99	**
Silver, total	ug/L	MW-17	19	1	20			4.0000	5.0000			4.0000	nonpar	.99	**
Thallium, total	ug/L	MW-17	18	1	20			0.5000	0.5000			2.0000	nonpar	.99	**
Vanadium, total	ug/L	MW-17	18	1	20			2.0000	2.0000			20.0000	nonpar	.99	**
Zinc, total	ug/L	MW-17	19	1	20			13.2000	12.5000			20.0000	nonpar	.99	**

N(back) and N(mon) = Non-outlier measurements in the background and monitoring periods.

N(tot) = All independent measurements for that constituent and well.

For transformed data, mean and SD in transformed units and control limit in original units.

Conf = confidence level for passing initial test or one verification resample (nonparametric test only).

* - Insufficient Data.

** - Detection Frequency < 25%.

*** - Zero Variance.

Table 4

**Dixon's Test Outliers
1% Significance Level**

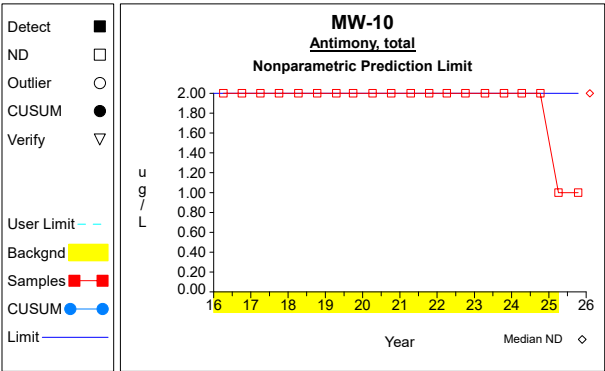
Constituent	Units	Well	Date	Result	ND Qualifier	Date Range	N	Critical Value
Beryllium, total	ug/L	MW-10	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-10	04/03/2025	0.2000	< 0.2000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-10	04/03/2025	1.0000		04/04/2016-04/03/2025	19	0.5503
Cobalt, total	ug/L	MW-10	10/04/2022	2.0000		04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-10	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-10	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-10	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503
Beryllium, total	ug/L	MW-11	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-11	04/03/2025	0.2000	< 0.2000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-11	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Cobalt, total	ug/L	MW-11	10/04/2022	2.1000		04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-11	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-11	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-11	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503
Zinc, total	ug/L	MW-11	04/04/2016	73.0000		04/04/2016-04/03/2025	19	0.5643
Zinc, total	ug/L	MW-11	10/04/2016	135.0000		04/04/2016-04/03/2025	19	0.5643
Beryllium, total	ug/L	MW-12	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-12	04/03/2025	0.2000	< 0.2000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-12	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Cobalt, total	ug/L	MW-12	04/03/2017	13.7000		04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-12	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-12	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-12	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503
Beryllium, total	ug/L	MW-13	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-13	04/03/2025	0.2000	< 0.2000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-13	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-13	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-13	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-13	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503
Beryllium, total	ug/L	MW-14	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-14	04/03/2025	0.2000	< 0.2000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-14	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-14	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-14	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-14	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503
Beryllium, total	ug/L	MW-15	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Cadmium, total	ug/L	MW-15	04/03/2025	0.2000	< 0.2000	04/10/2014-04/03/2025	21	0.5263
Chromium, total	ug/L	MW-15	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-15	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Nickel, total	ug/L	MW-15	04/10/2014	31.1000		04/10/2014-04/03/2025	21	0.5263
Thallium, total	ug/L	MW-15	04/03/2025	0.5000	< 0.5000	04/10/2014-04/03/2025	21	0.5263
Vanadium, total	ug/L	MW-15	04/03/2025	2.0000	< 2.0000	04/10/2014-04/03/2025	21	0.5263
Beryllium, total	ug/L	MW-17	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Chromium, total	ug/L	MW-17	04/03/2025	1.9000		04/04/2016-04/03/2025	19	0.5503
Lead, total	ug/L	MW-17	04/03/2025	1.0000	< 1.0000	04/04/2016-04/03/2025	19	0.5503
Thallium, total	ug/L	MW-17	04/03/2025	0.5000	< 0.5000	04/04/2016-04/03/2025	19	0.5503
Vanadium, total	ug/L	MW-17	04/03/2025	2.0000	< 2.0000	04/04/2016-04/03/2025	19	0.5503

N = Total number of independent measurements in background at each well.

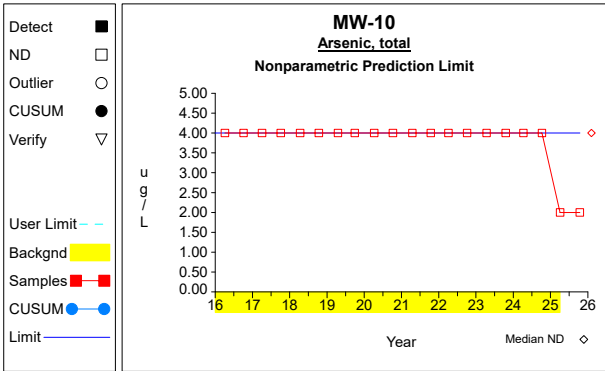
Date Range = Dates of the first and last measurements included in background at each well.

Critical Value depends on the significance level and on N-1 when the two most extreme values are tested or N for the most extreme value.

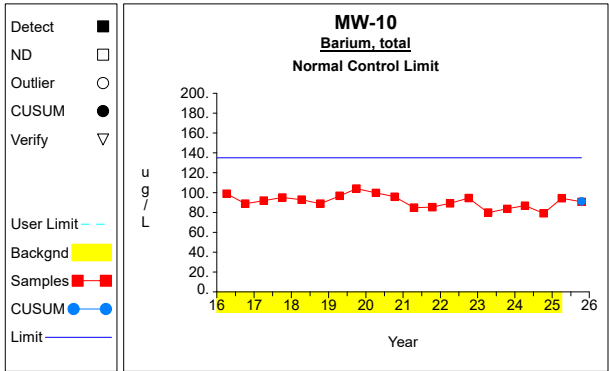
Intra-Well Control Charts / Prediction Limits



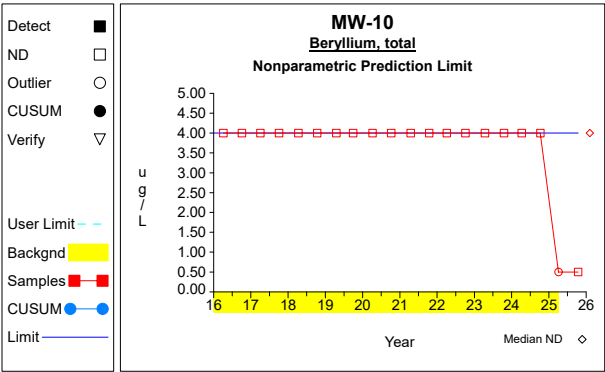
Graph 1



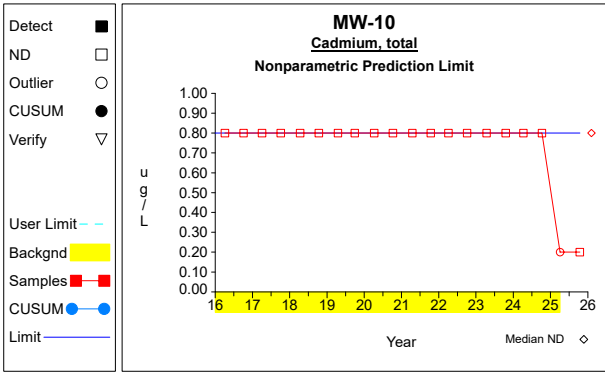
Graph 2



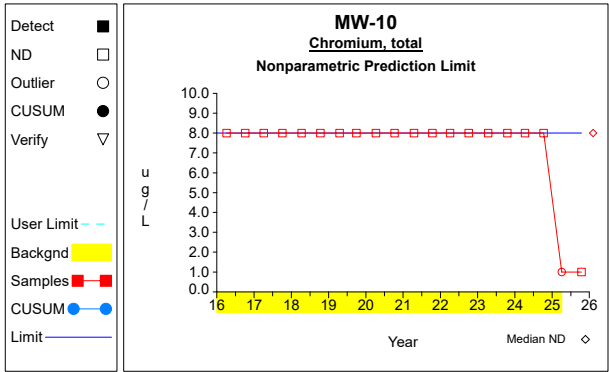
Graph 3



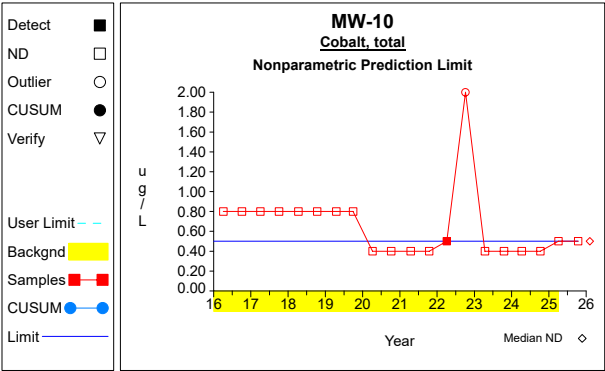
Graph 4



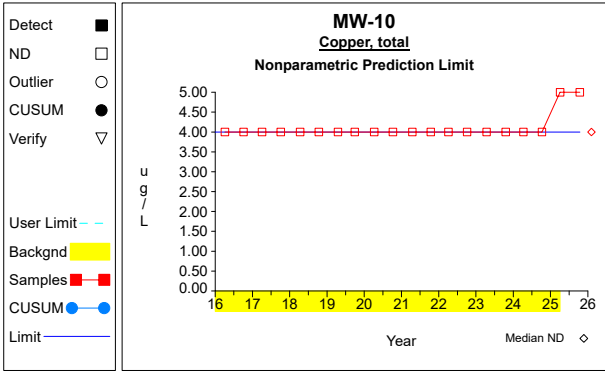
Graph 5



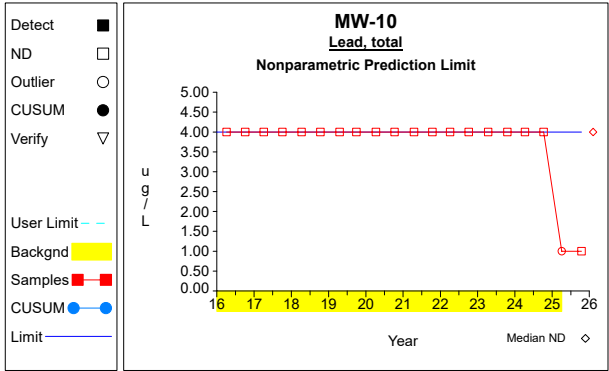
Graph 6



Graph 7

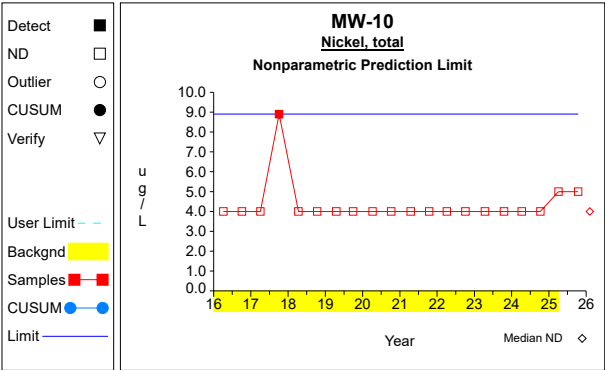


Graph 8

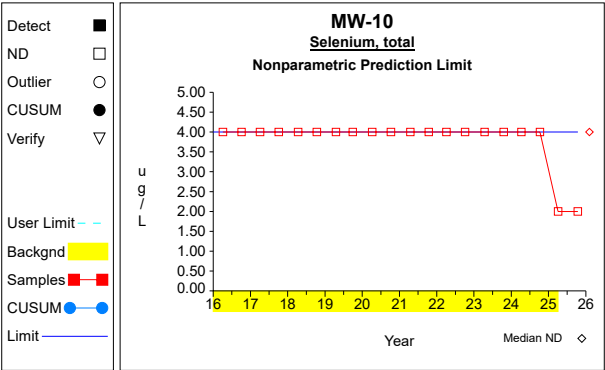


Graph 9

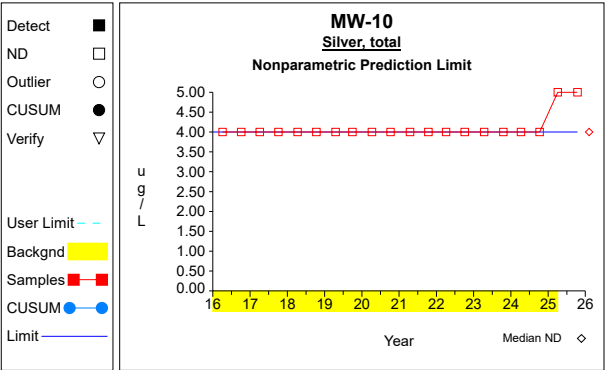
Intra-Well Control Charts / Prediction Limits



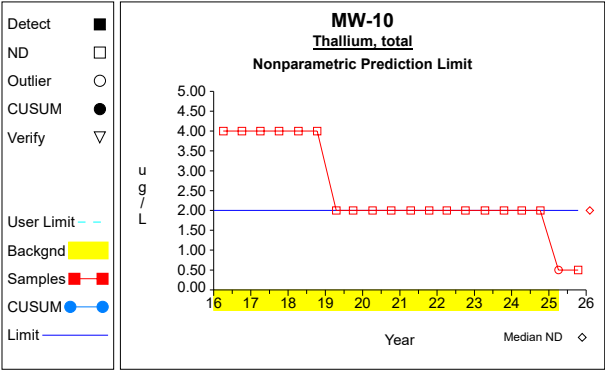
Graph 10



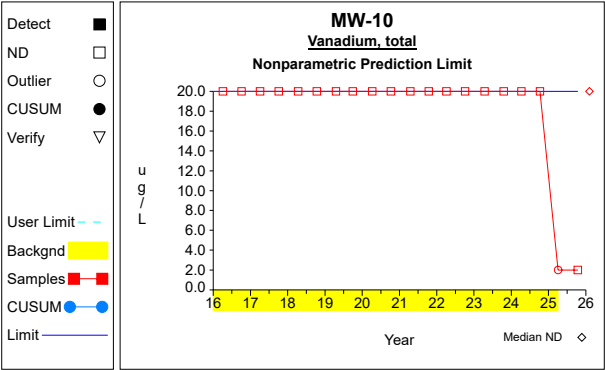
Graph 11



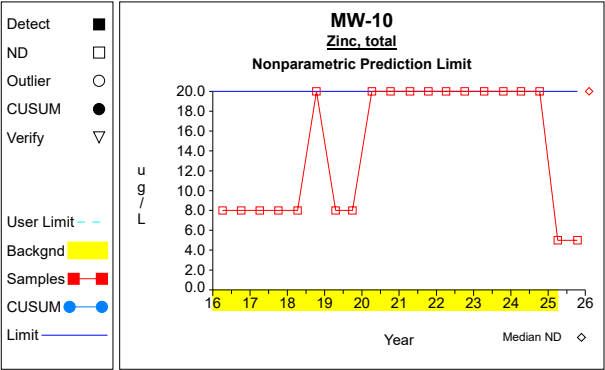
Graph 12



Graph 13

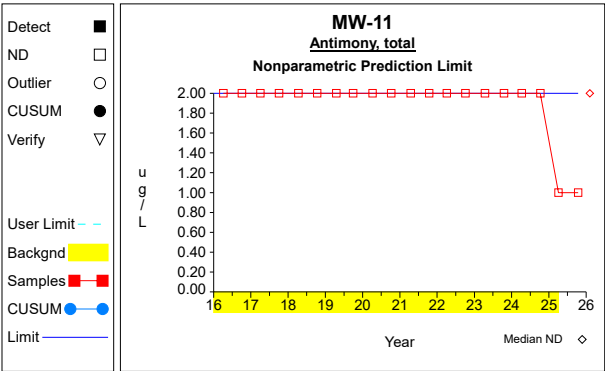


Graph 14

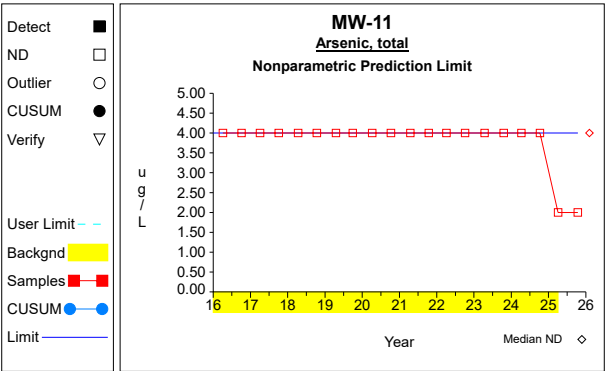


Graph 15

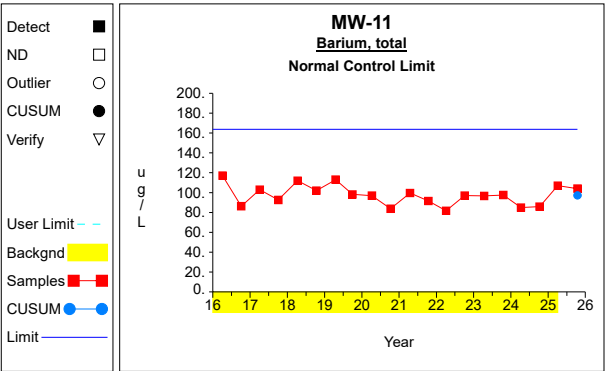
Intra-Well Control Charts / Prediction Limits



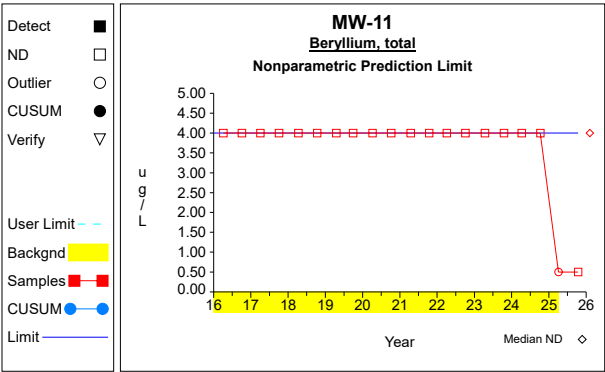
Graph 16



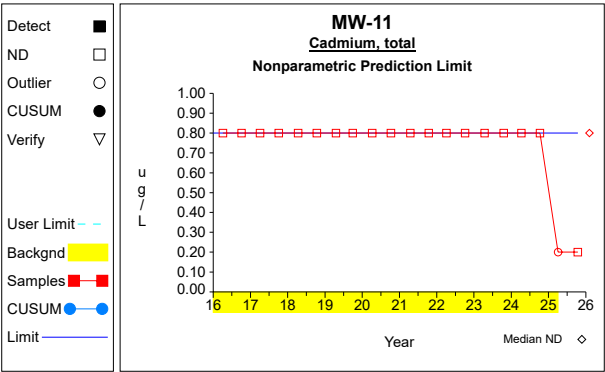
Graph 17



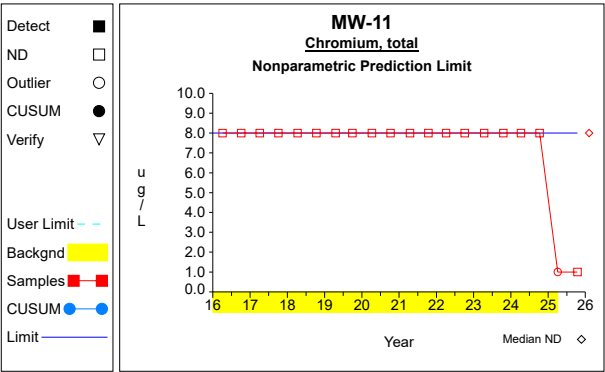
Graph 18



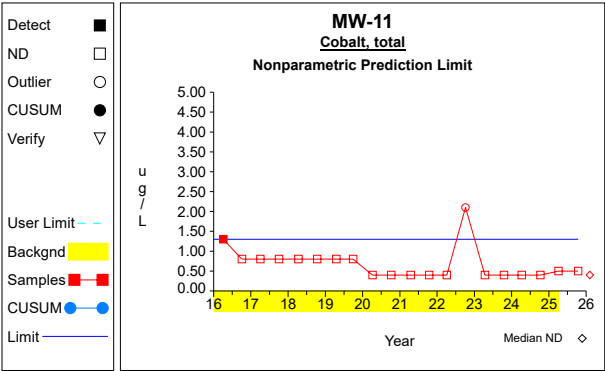
Graph 19



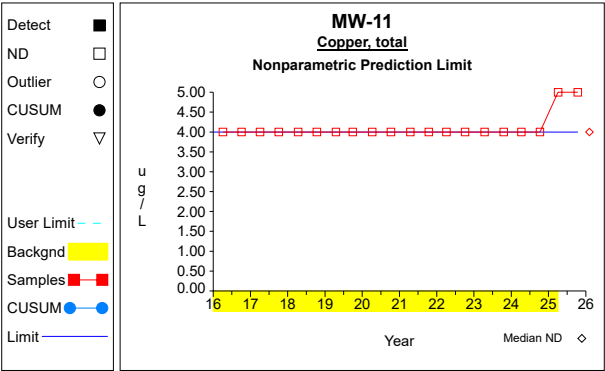
Graph 20



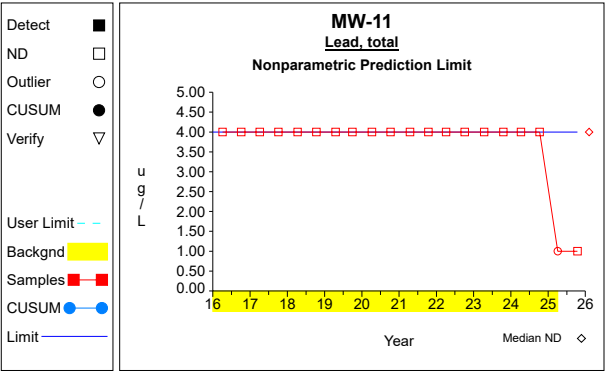
Graph 21



Graph 22

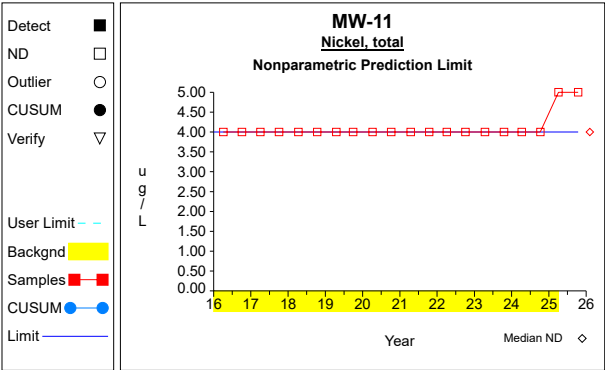


Graph 23

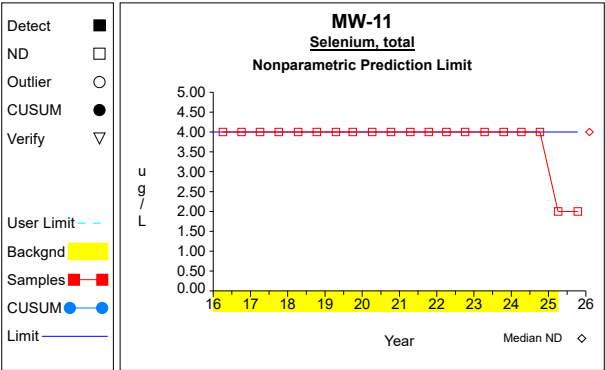


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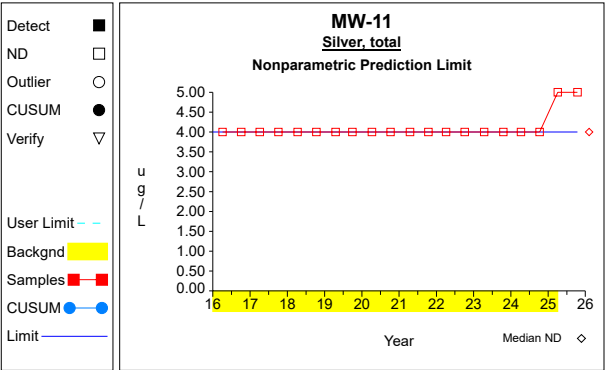
Intra-Well Control Charts / Prediction Limits



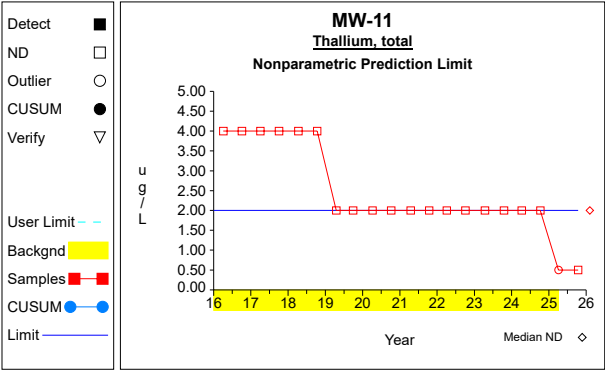
Graph 25



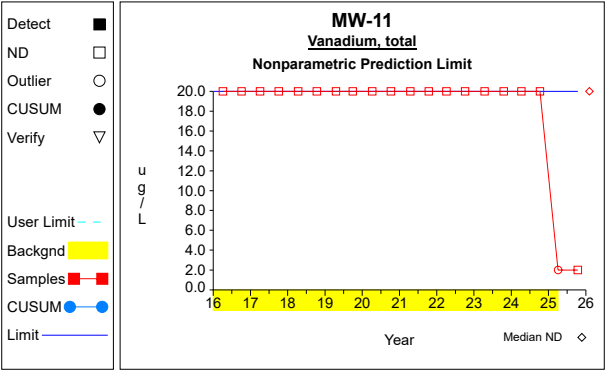
Graph 26



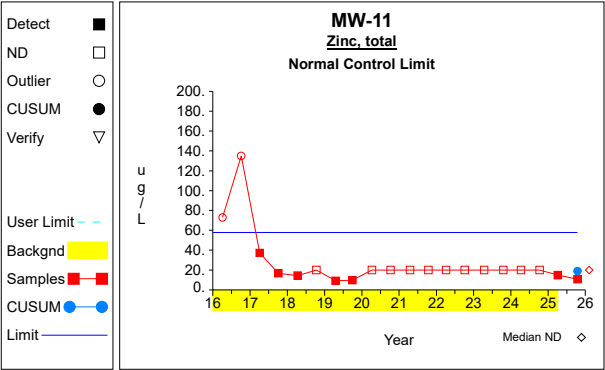
Graph 27



Graph 28

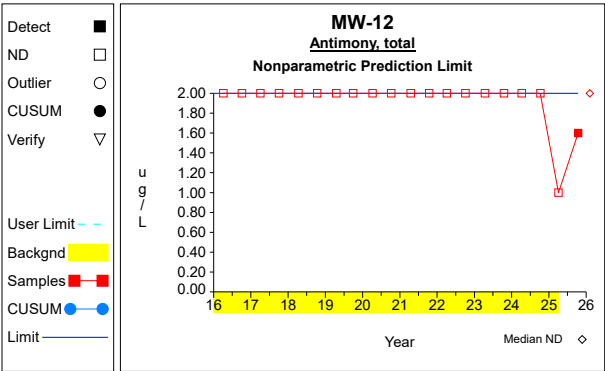


Graph 29

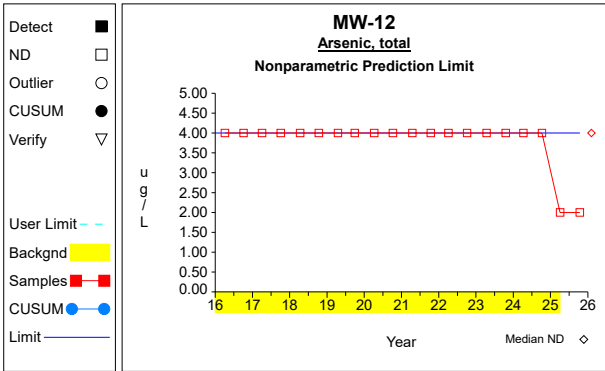


Graph 30

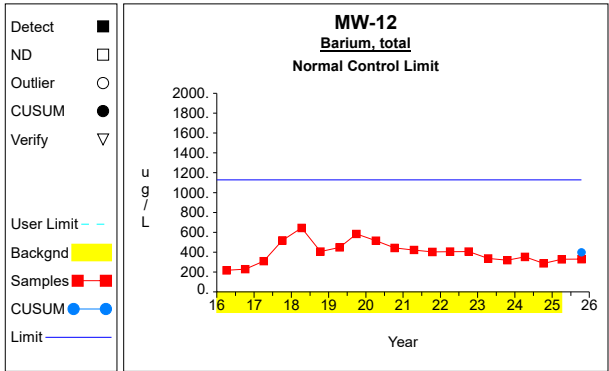
Intra-Well Control Charts / Prediction Limits



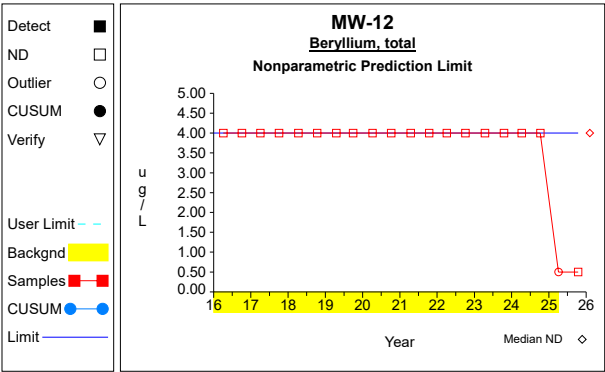
Graph 31



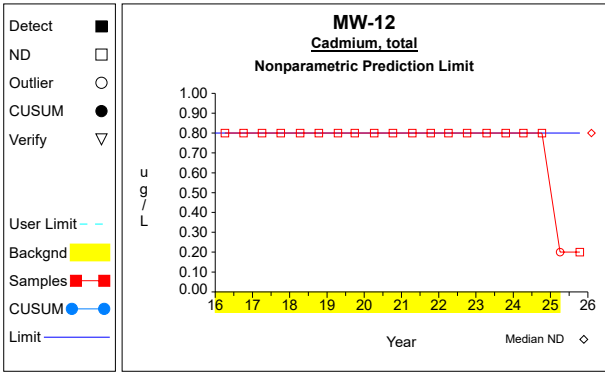
Graph 32



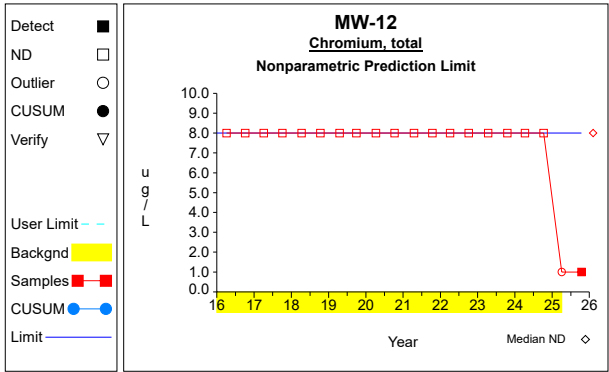
Graph 33



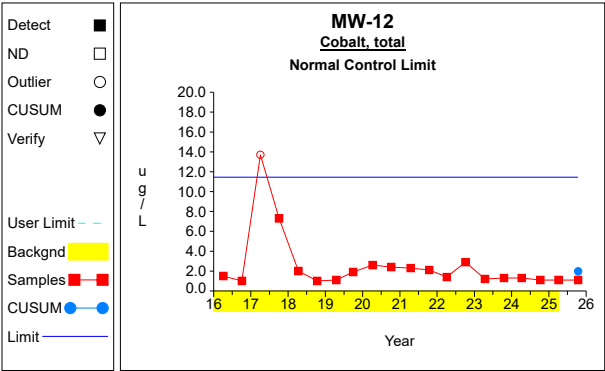
Graph 34



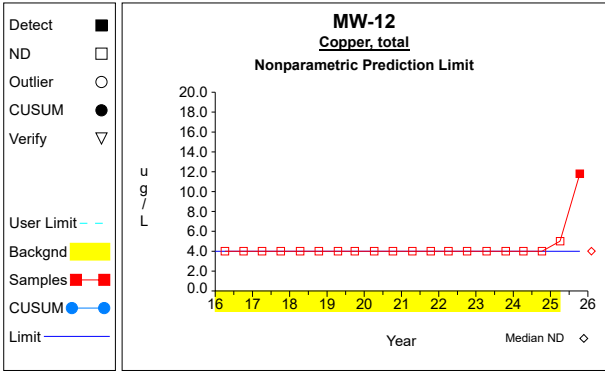
Graph 35



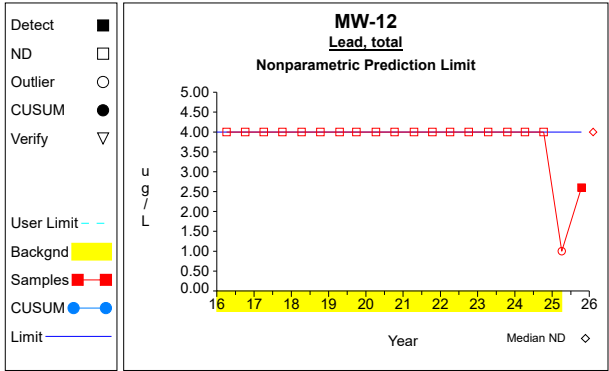
Graph 36



Graph 37

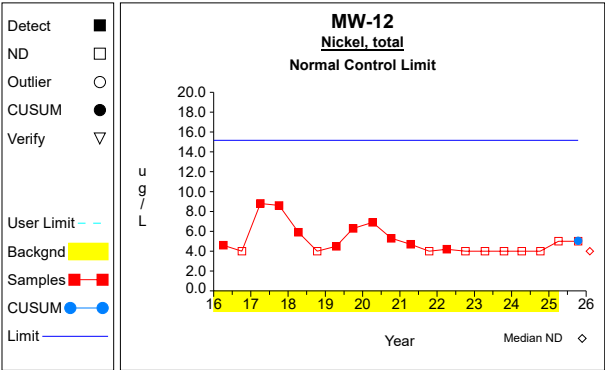


Graph 38

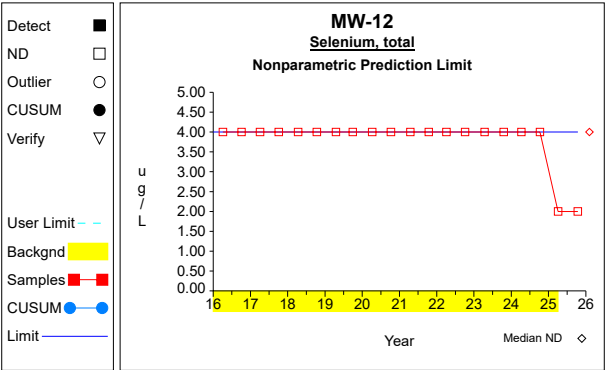


Graph 39

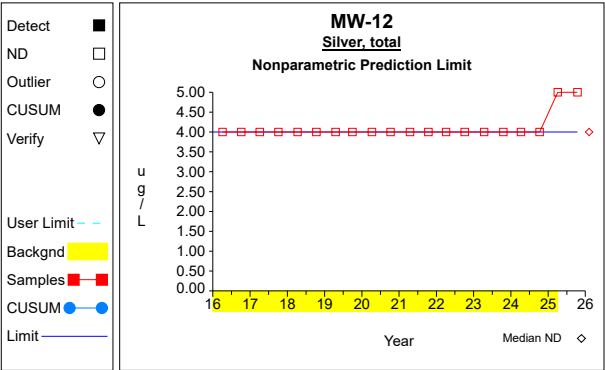
Intra-Well Control Charts / Prediction Limits



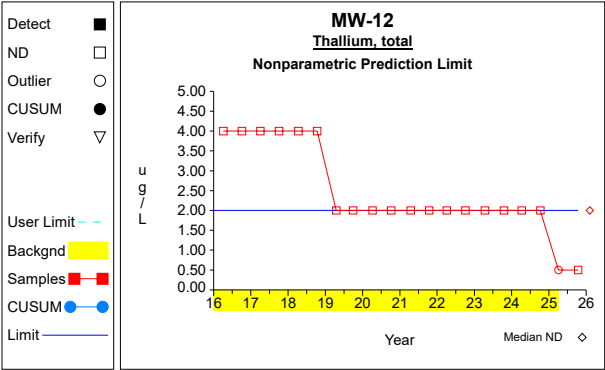
Graph 40



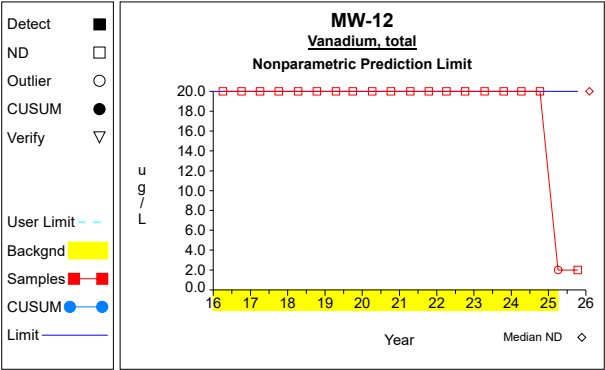
Graph 41



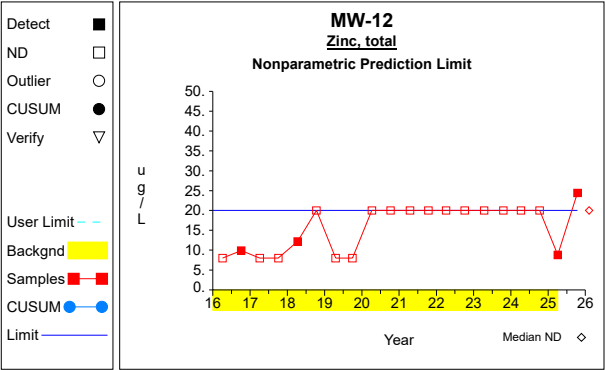
Graph 42



Graph 43

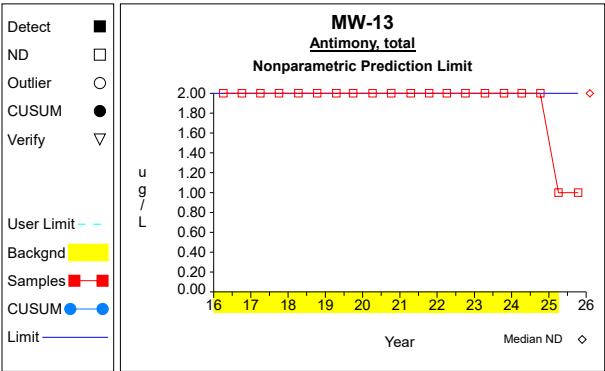


Graph 44

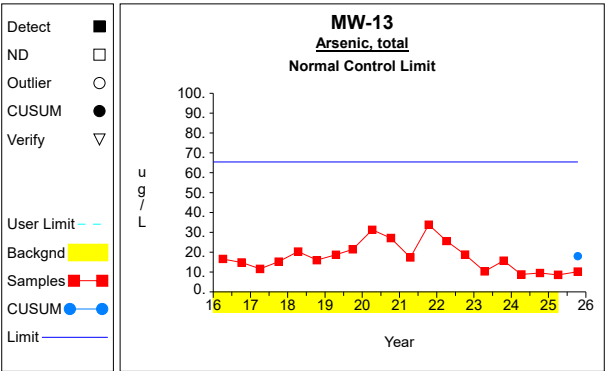


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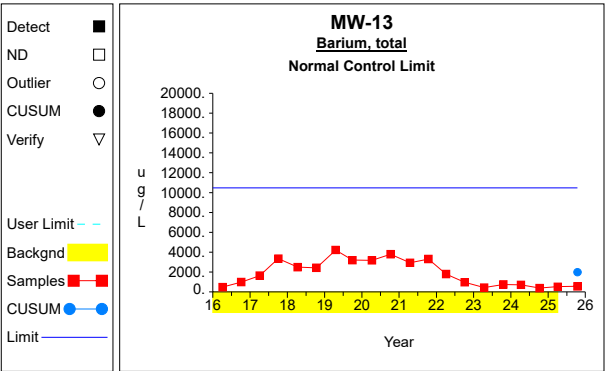
Intra-Well Control Charts / Prediction Limits



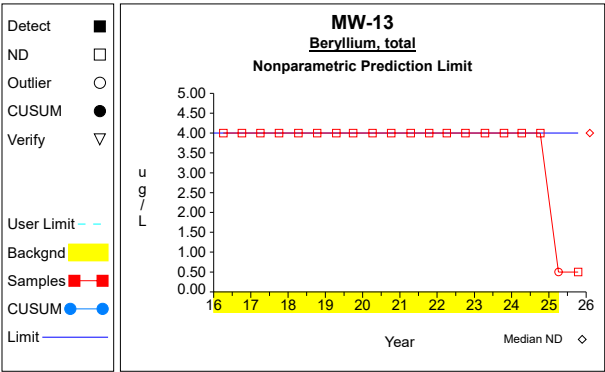
Graph 46



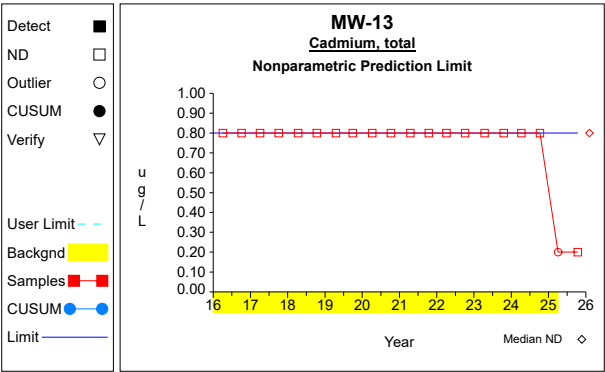
Graph 47



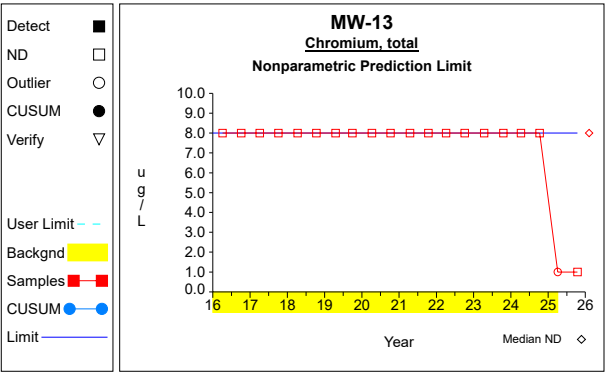
Graph 48



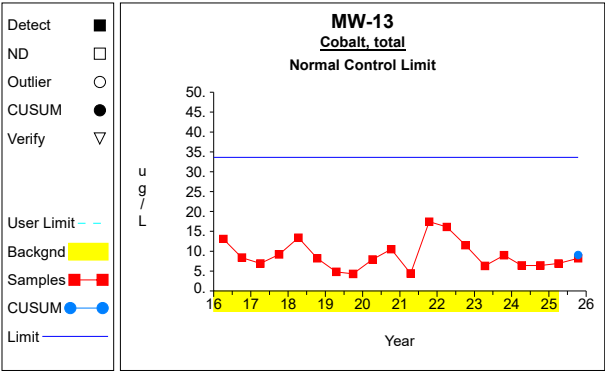
Graph 49



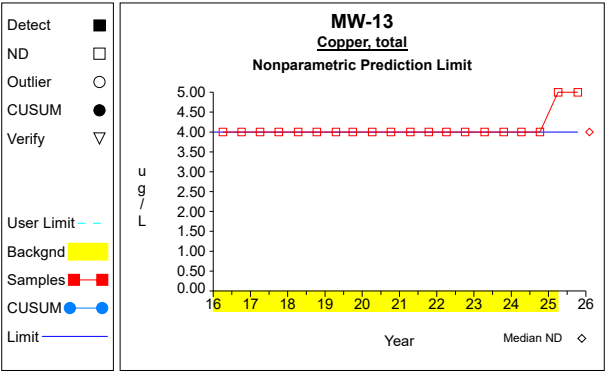
Graph 50



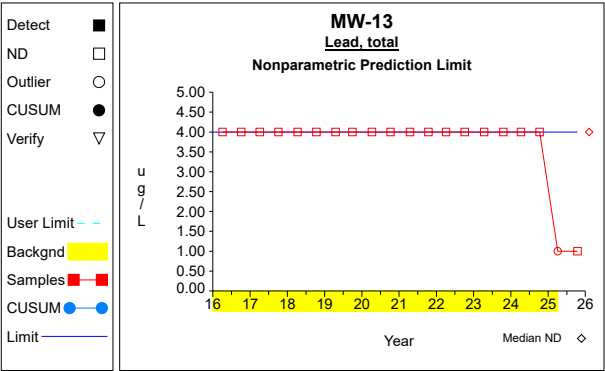
Graph 51



Graph 52

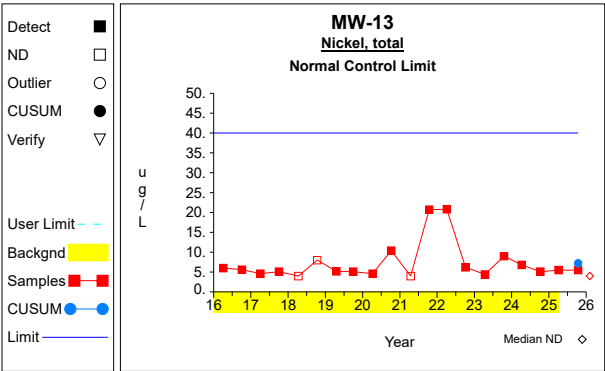


Graph 53

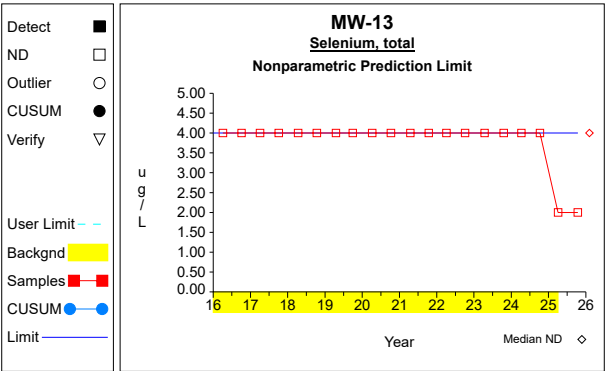


Graph 54

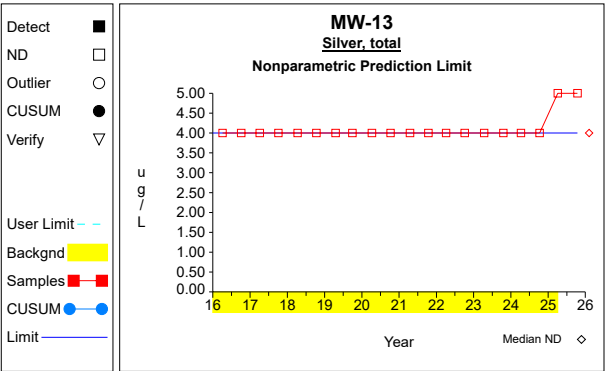
Intra-Well Control Charts / Prediction Limits



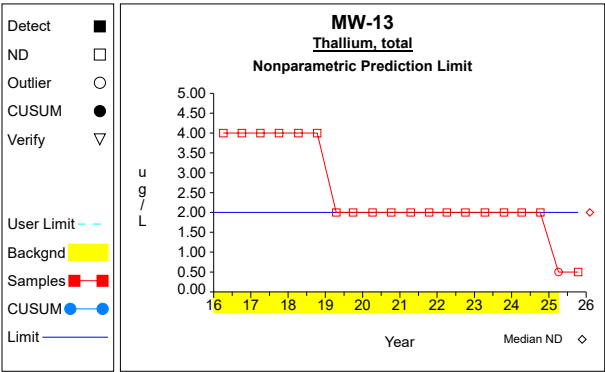
Graph 55



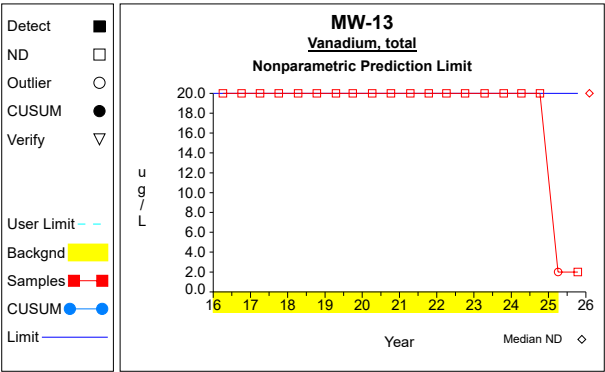
Graph 56



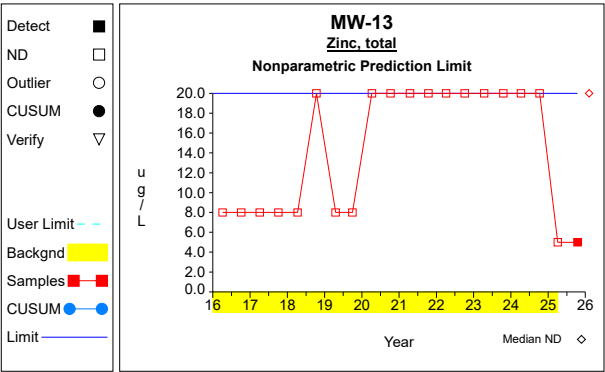
Graph 57



Graph 58

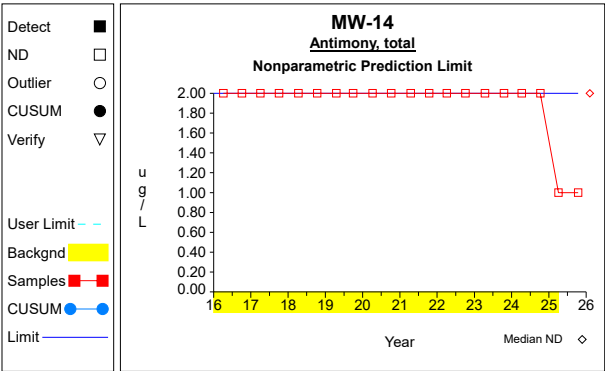


Graph 59

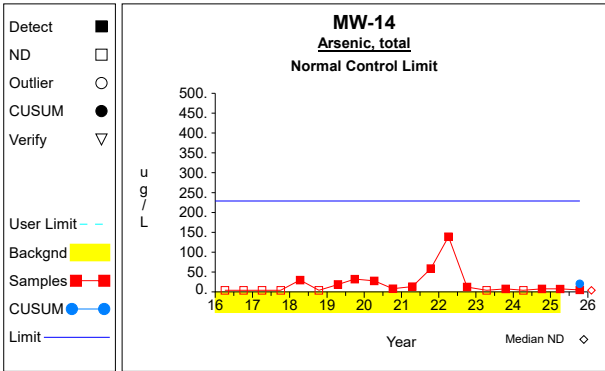


Graph 60

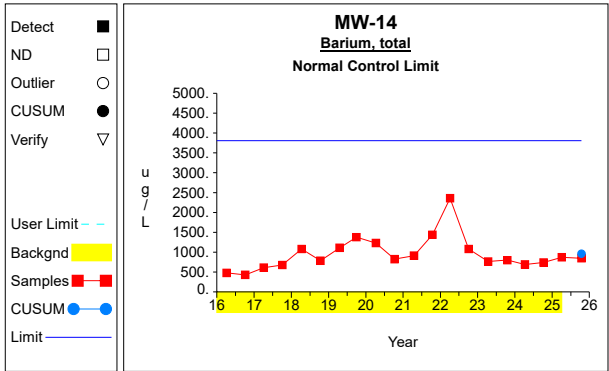
Intra-Well Control Charts / Prediction Limits



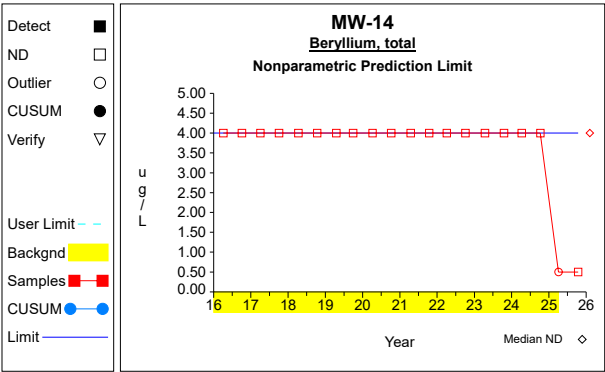
Graph 61



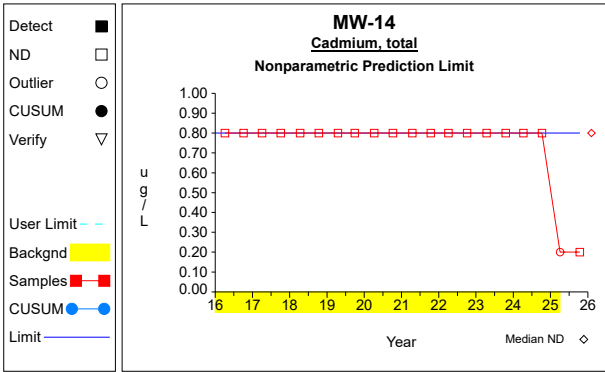
Graph 62



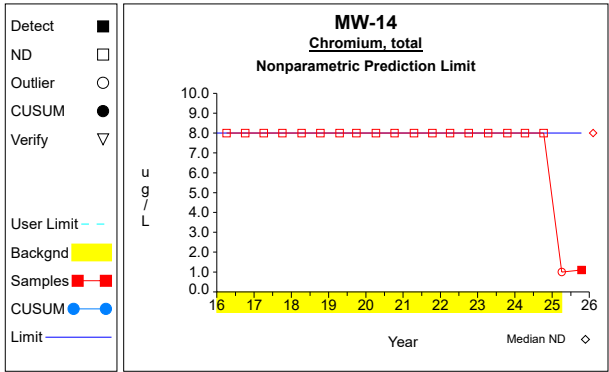
Graph 63



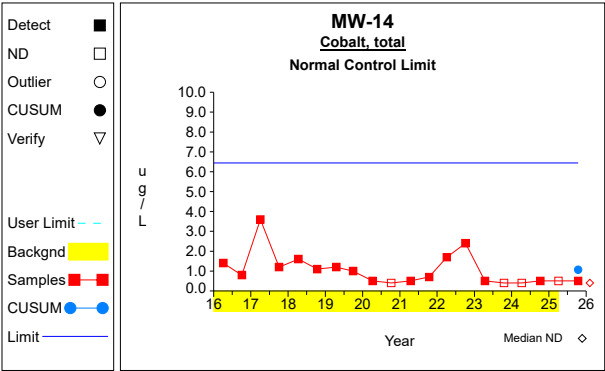
Graph 64



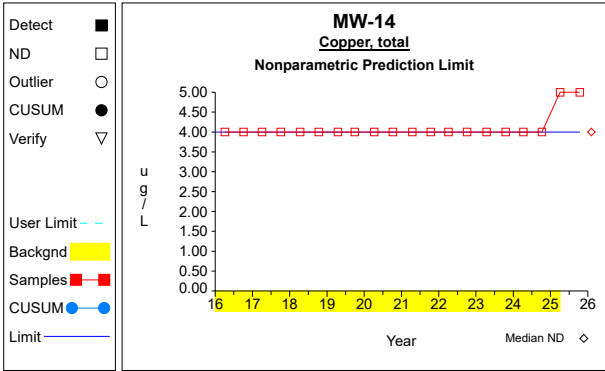
Graph 65



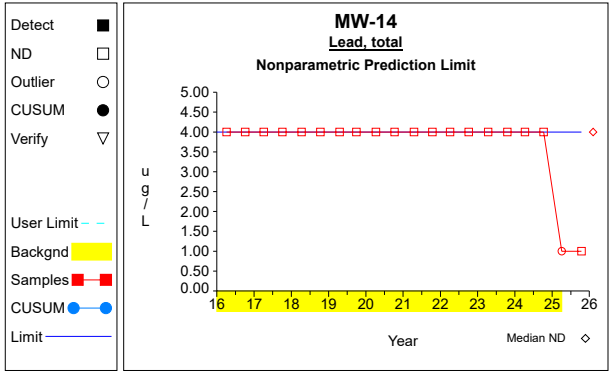
Graph 66



Graph 67

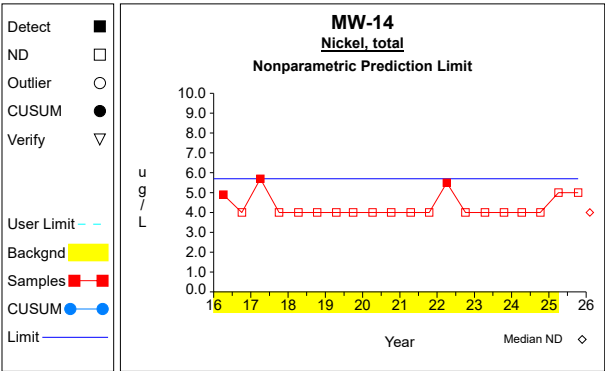


Graph 68

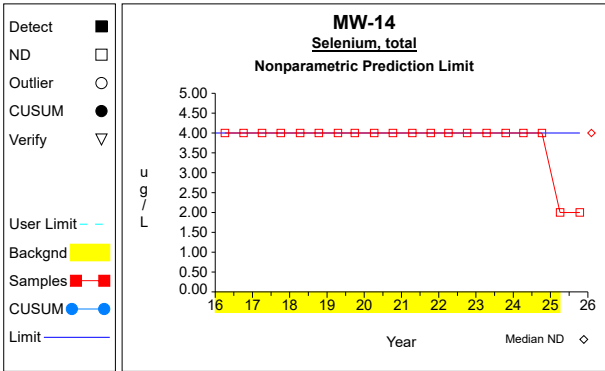


Graph 69

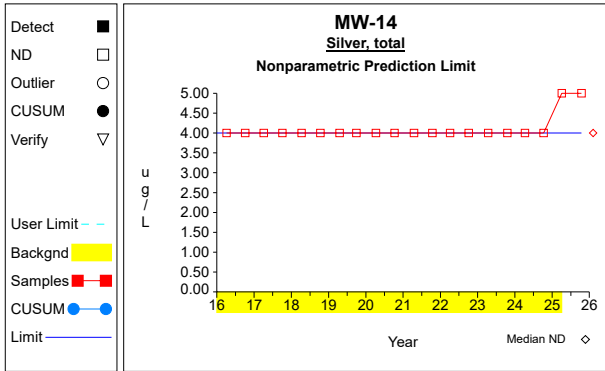
Intra-Well Control Charts / Prediction Limits



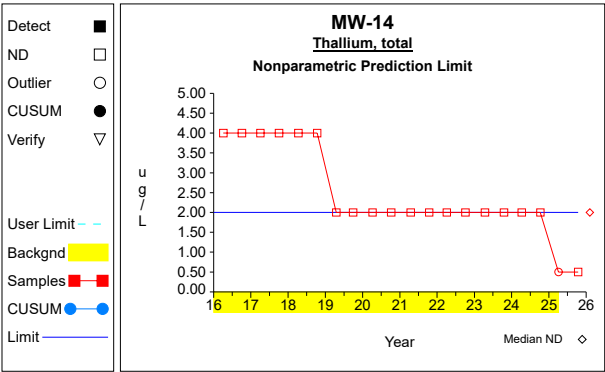
Graph 70



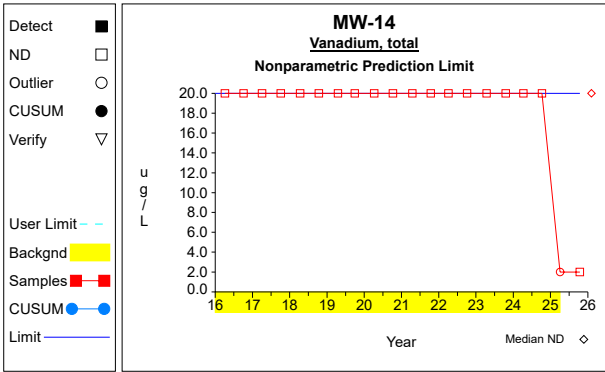
Graph 71



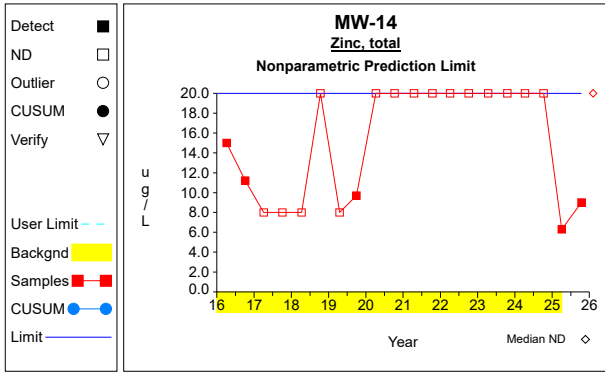
Graph 72



Graph 73

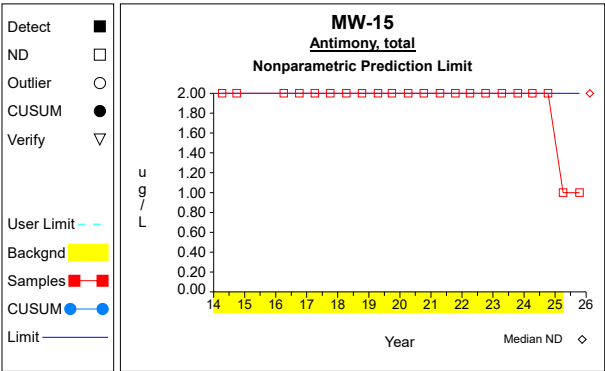


Graph 74

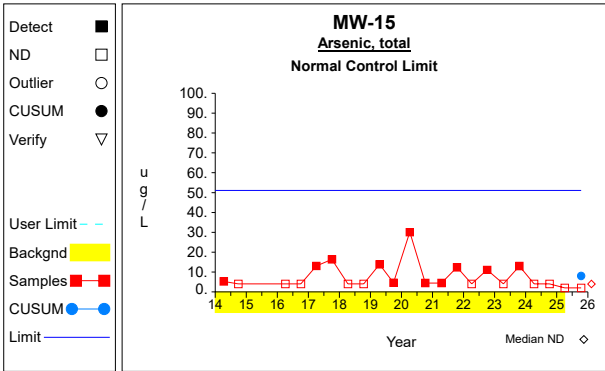


Graph 75

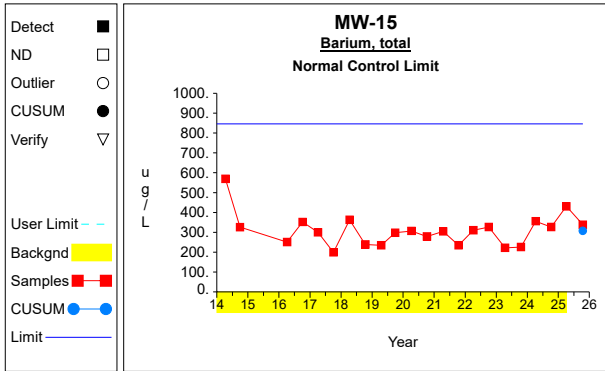
Intra-Well Control Charts / Prediction Limits



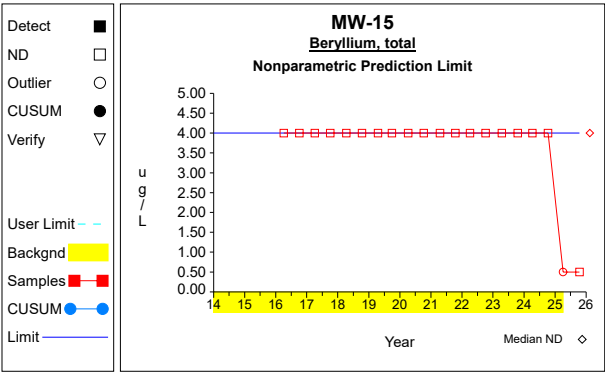
Graph 76



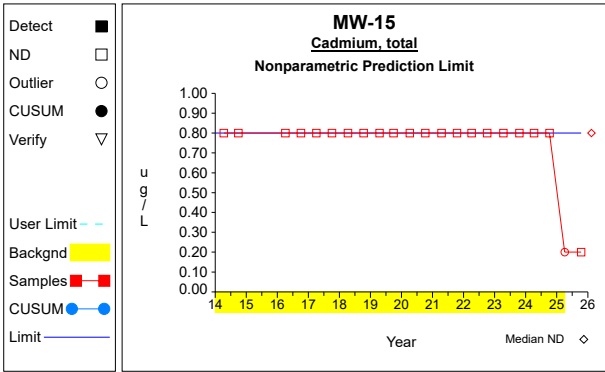
Graph 77



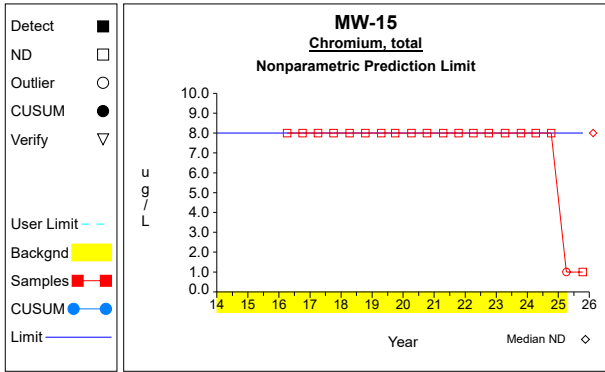
Graph 78



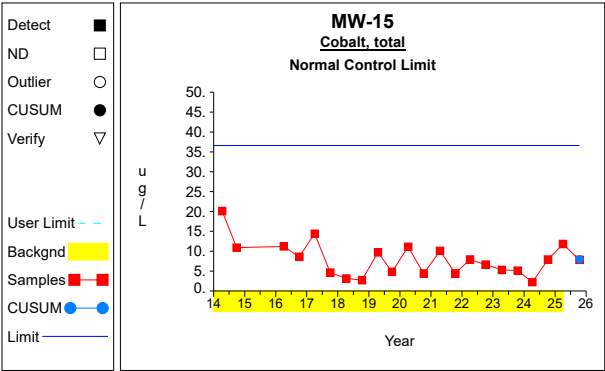
Graph 79



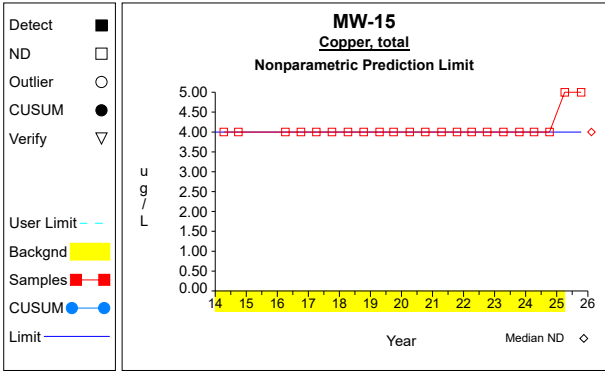
Graph 80



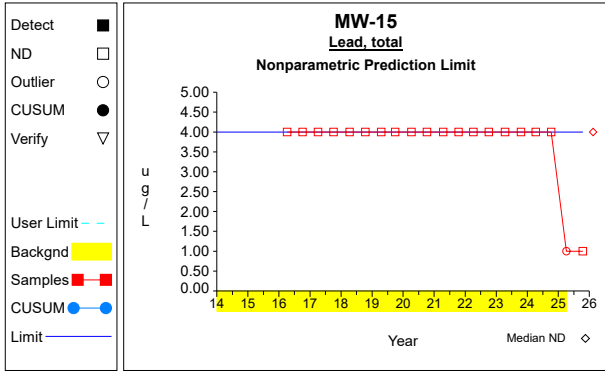
Graph 81



Graph 82

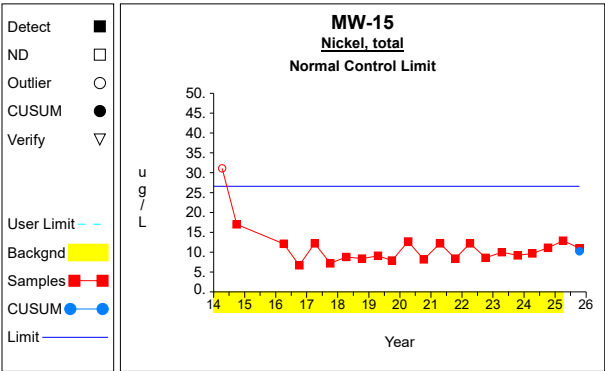


Graph 83

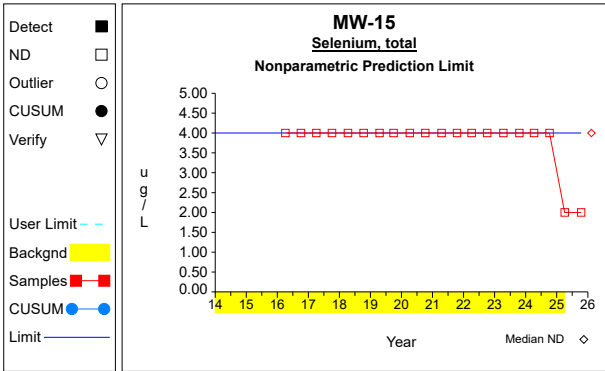


Graph 84

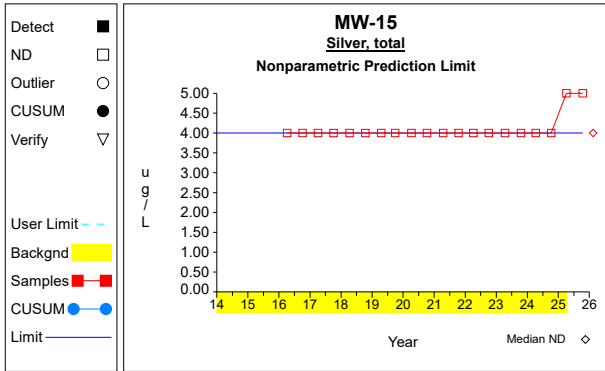
Intra-Well Control Charts / Prediction Limits



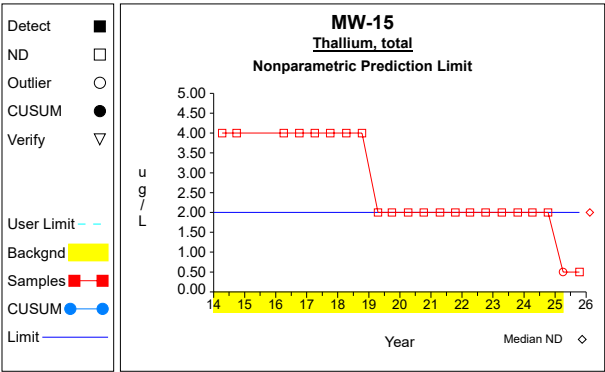
Graph 85



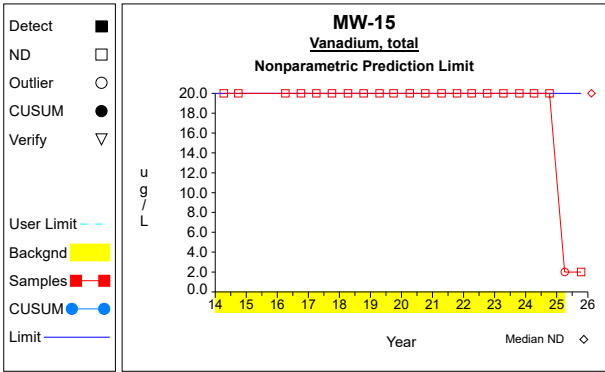
Graph 86



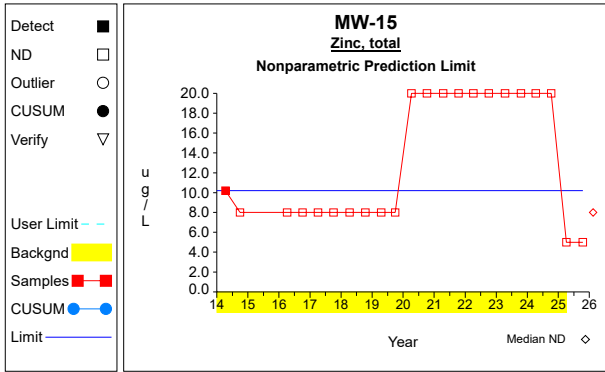
Graph 87



Graph 88

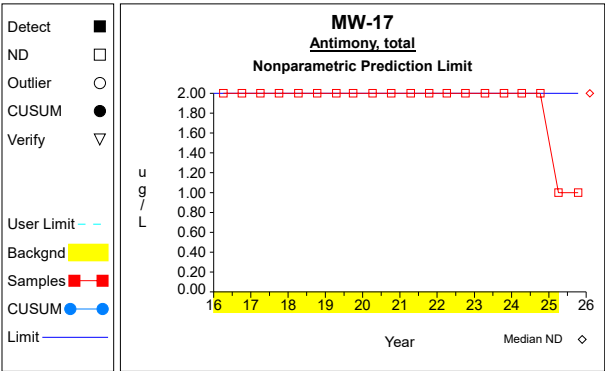


Graph 89

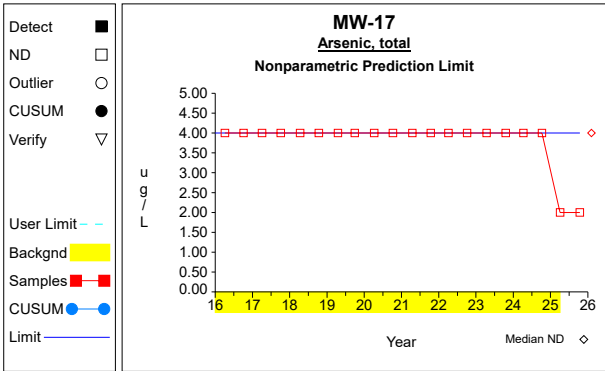


Graph 90

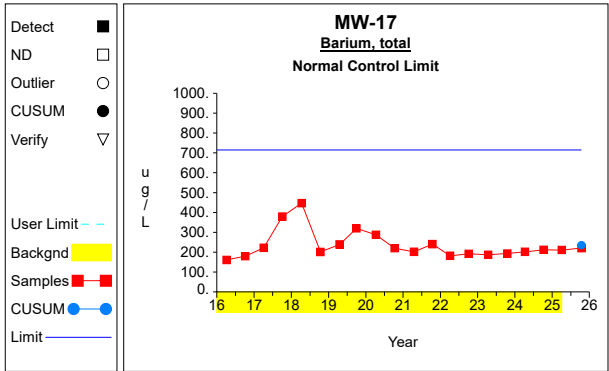
Intra-Well Control Charts / Prediction Limits



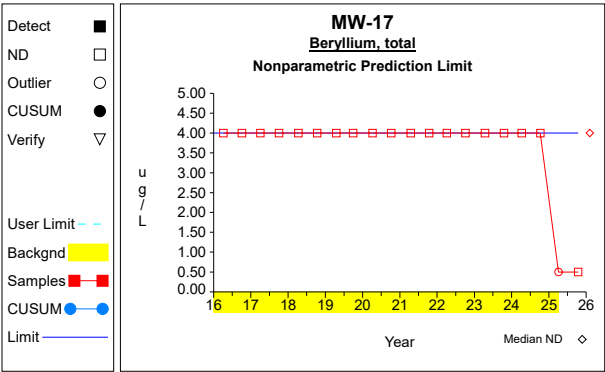
Graph 91



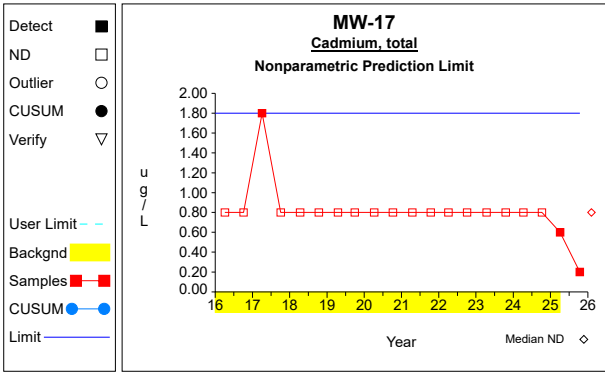
Graph 92



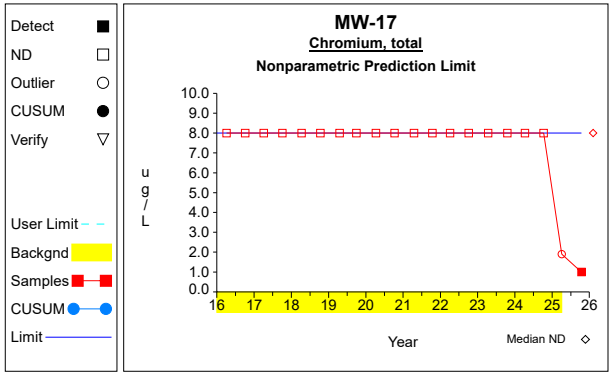
Graph 93



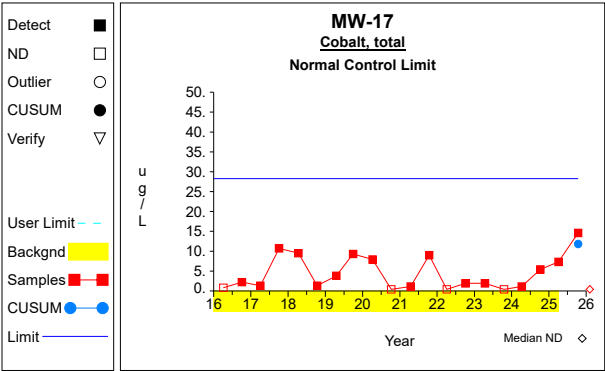
Graph 94



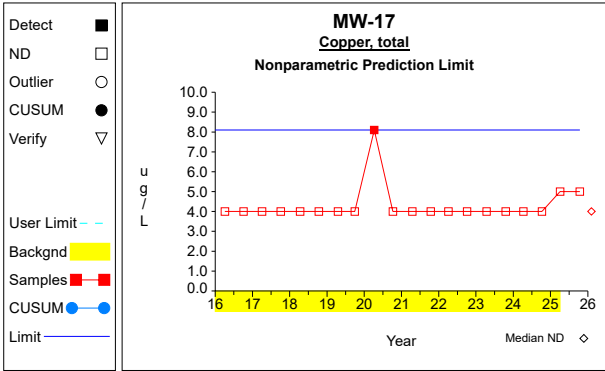
Graph 95



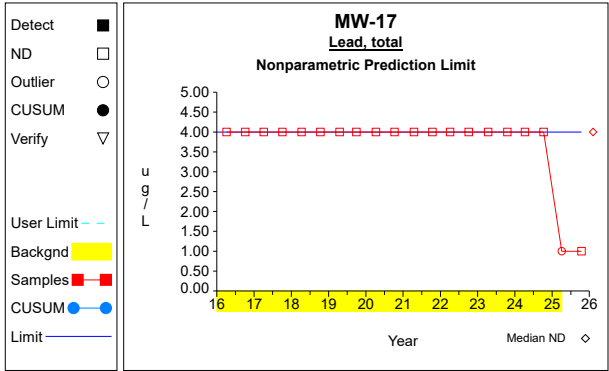
Graph 96



Graph 97

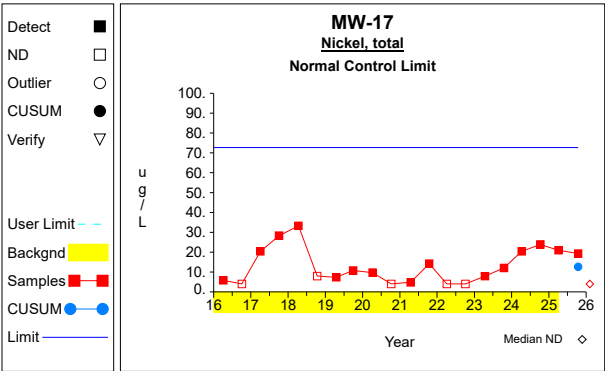


Graph 98

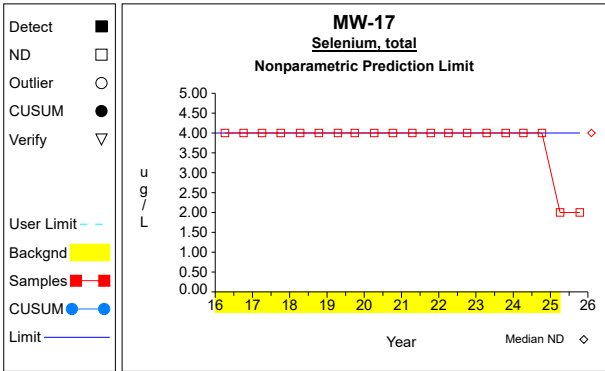


Graph 99

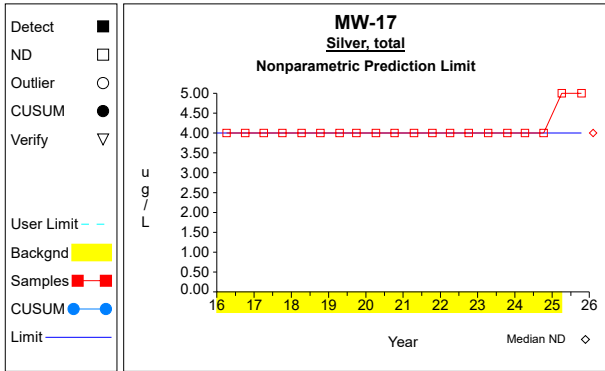
Intra-Well Control Charts / Prediction Limits



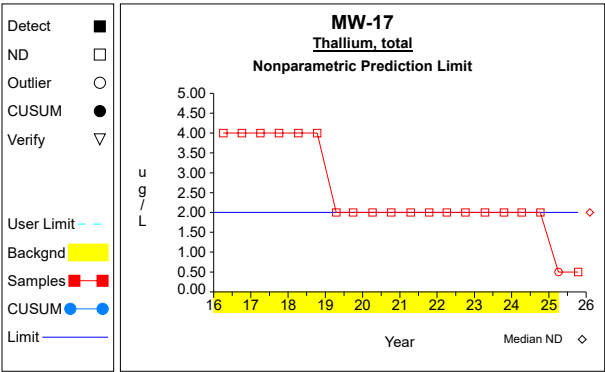
Graph 100



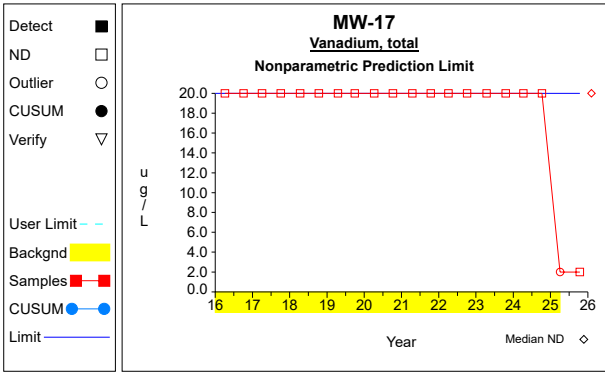
Graph 101



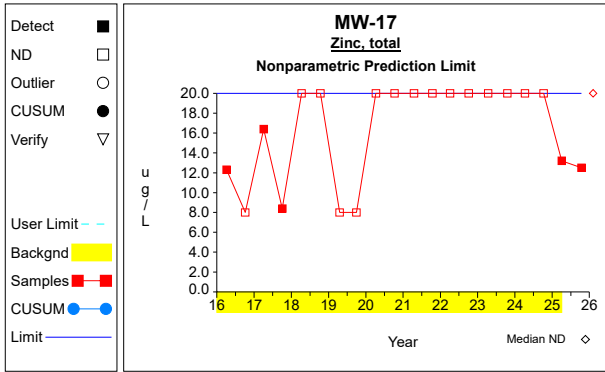
Graph 102



Graph 103

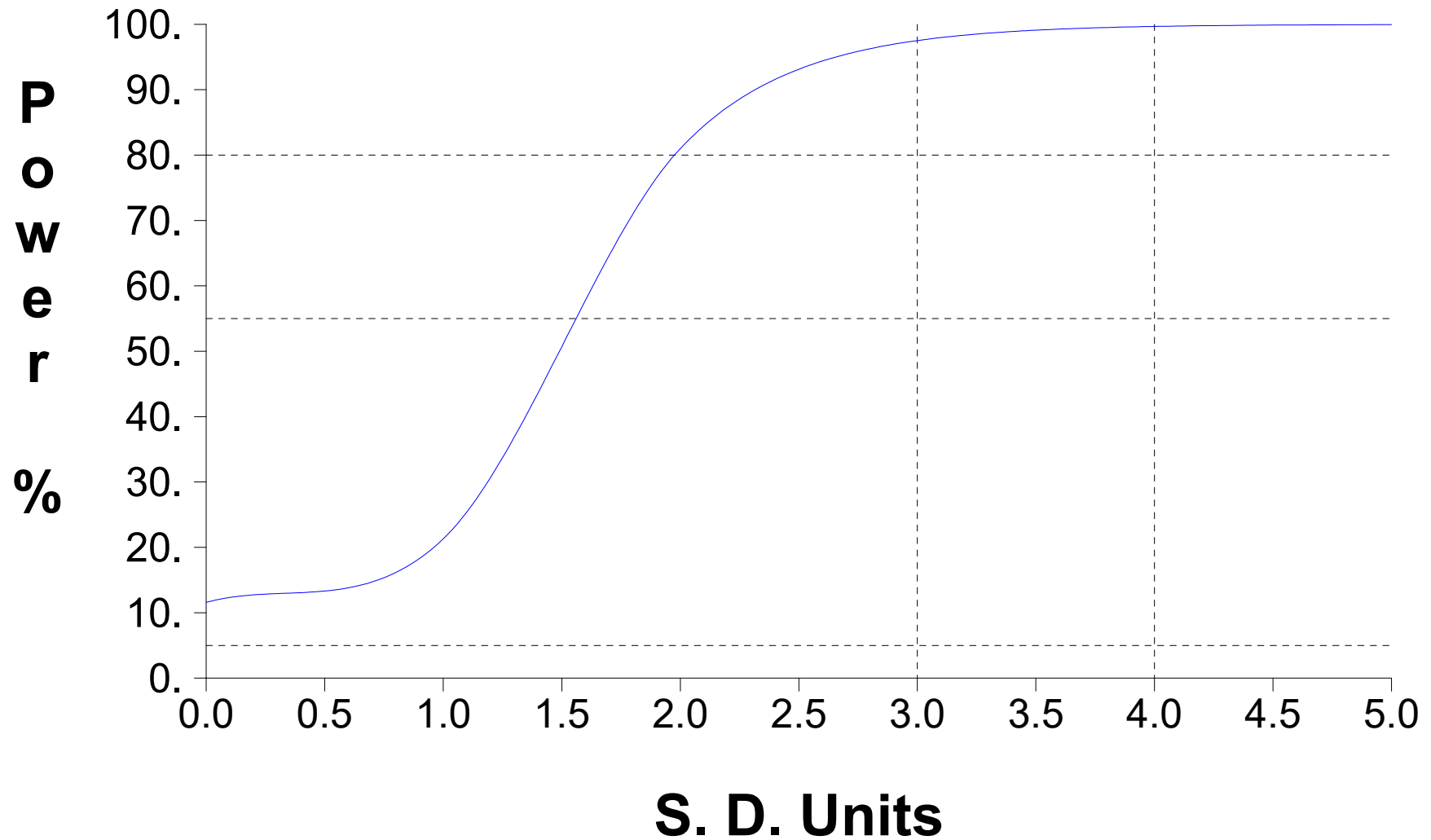


Graph 104



Graph 105

False Positive and False Negative Rates for Current Intra-Well Control Charts Monitoring Program



Attachment F

Assessment Statistics for Trace Metals

Table 1

**Confidence Intervals for Comparing the Mean of the Last
4 Measurements to an Assessment Monitoring Standard**

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	
Arsenic, total	ug/L	MW-12	4	2.000	0.000	1.176	2.000	2.000	10.000	
Barium, total	ug/L	MW-12	4	324.750	27.500	1.176	292.402	357.098	2000.000	
Cobalt, total	ug/L	MW-12	4	1.150	0.100	1.176	1.032	1.268	2.100	
Nickel, total	ug/L	MW-12	4	2.000	0.000	1.176	2.000	2.000	100.000	
Arsenic, total	ug/L	MW-13	4	9.275	0.727	1.176	8.419	10.131	10.000	
Barium, total	ug/L	MW-13	4	549.000	133.079	1.176	392.461	705.539	2000.000	
Cobalt, total	ug/L	MW-13	4	6.975	0.850	1.176	5.975	7.975	2.100	**
Nickel, total	ug/L	MW-13	4	5.725	0.741	1.176	4.853	6.597	100.000	
Arsenic, total	ug/L	MW-14	4	5.525	2.640	1.176	2.420	8.630	10.000	
Barium, total	ug/L	MW-14	4	788.250	86.908	1.176	686.022	890.478	2000.000	
Cobalt, total	ug/L	MW-14	4	0.350	0.173	1.176	0.146	0.554	2.100	
Nickel, total	ug/L	MW-14	4	2.000	0.000	1.176	2.000	2.000	100.000	
Arsenic, total	ug/L	MW-15	4	2.000	0.000	1.176	2.000	2.000	10.000	
Barium, total	ug/L	MW-15	4	363.000	46.883	1.176	307.852	418.148	2000.000	
Cobalt, total	ug/L	MW-15	4	7.425	3.950	1.176	2.779	12.071	2.100	**
Nickel, total	ug/L	MW-15	4	11.175	1.315	1.176	9.628	12.722	100.000	
Arsenic, total	ug/L	MW-17	4	2.000	0.000	1.176	2.000	2.000	10.000	
Barium, total	ug/L	MW-17	4	211.500	7.767	1.176	202.363	220.637	2000.000	
Cobalt, total	ug/L	MW-17	4	7.100	5.633	1.176	0.474	13.726	2.100	
Nickel, total	ug/L	MW-17	4	21.150	1.964	1.176	18.840	23.460	100.000	

* - Insufficient Data

** - Significant Exceedance

LCL = Lower Confidence Limit

UCL = Upper Confidence Limit

MW-12
Arsenic, total

u g / L

Year

Median ND/2

Detect

ND

User Limit

Trend test

Samples

95% LCL

Standard

Year	u g / L
16	4.0
17	4.0
18	4.0
19	4.0
20	4.0
21	4.0
22	4.0
23	4.0
24	4.0
25	4.0
26	2.0

MW-12
Barium, total

Legend:

- Detect (Black square)
- ND (White square)
- User Limit (Dashed blue line)
- Trend test (Yellow shaded area)
- Samples (Red line with square markers)
- 95% LCL (Blue shaded area)
- Standard (Solid blue line)

Year	Barium (ug/L)
16	220
17	250
18	500
19	420
20	580
21	450
22	400
23	400
24	320
25	320
26	320

Detect
ND

User Limit
Trend test
Samples
95% LCL
Standard

MW-12
Cobalt, total

Year	Cobalt Concentration (ug/L)
16	1.5
17	1.0
18	14.0
19	7.5
20	2.0
21	2.5
22	2.0
23	1.5
24	2.5
25	1.5
26	1.5

MW-12
Nickel, total

u g / L

100.

10.0

1.00

16 17 18 19 20 21 22 23 24 25 26

Year

Median ND/2 ◇

Detect ■

ND □

User Limit - - -

Trend test

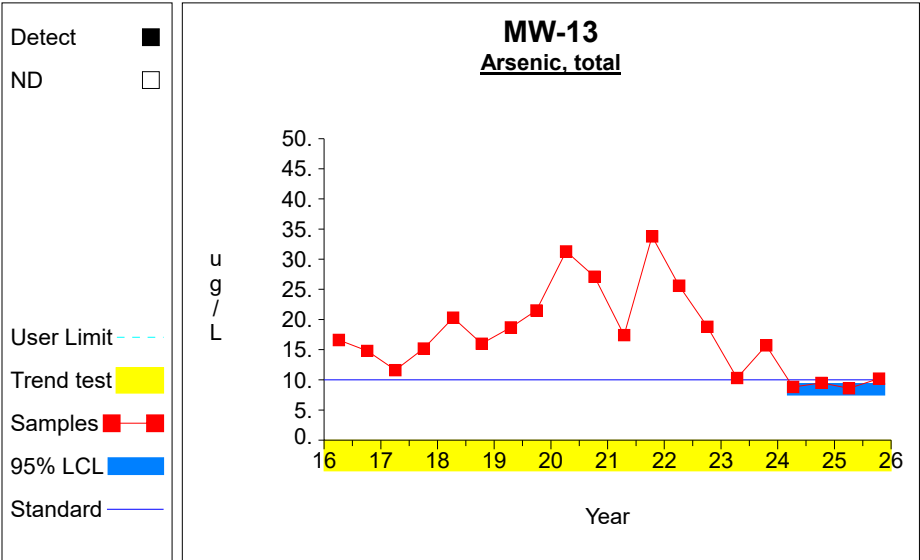
Samples ■—■

95% LCL

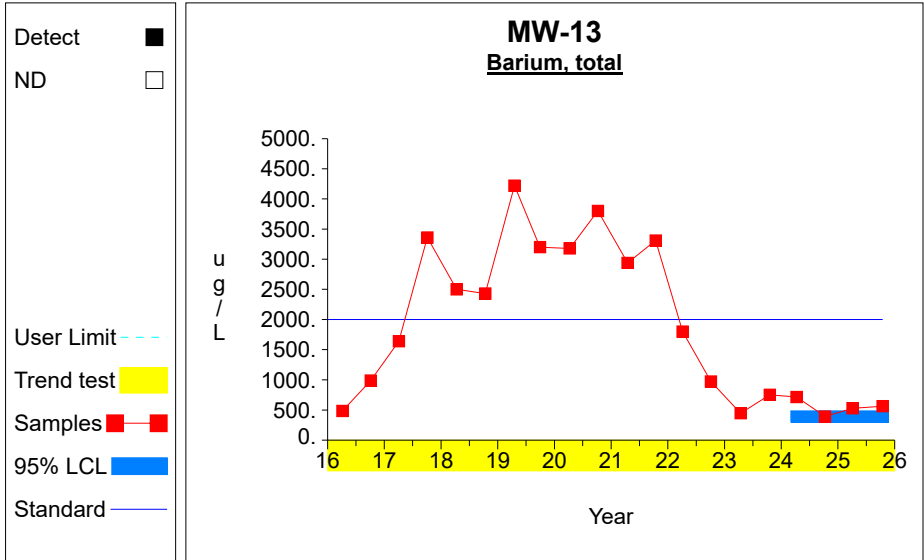
Standard —

Prepared by: Otter Creek Environmental

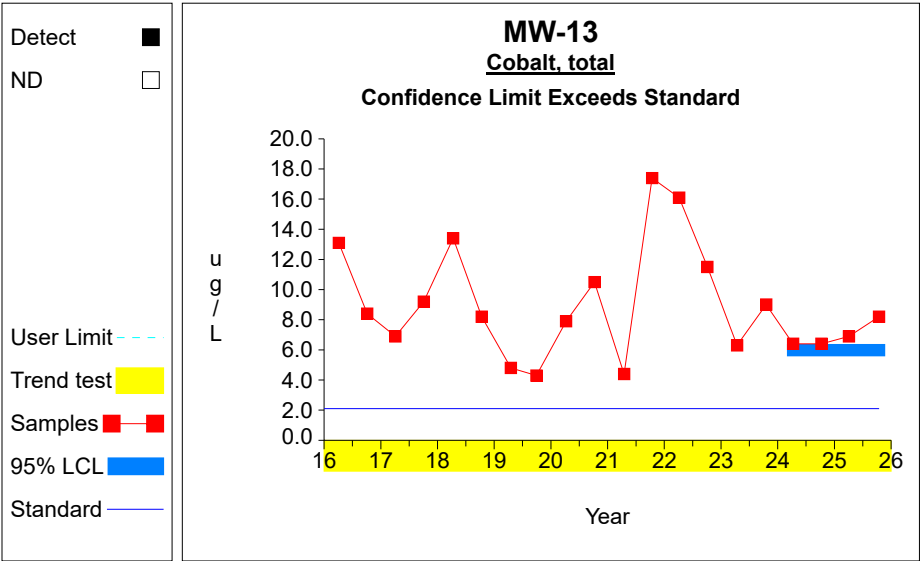
Confidence Limits (Assessment)



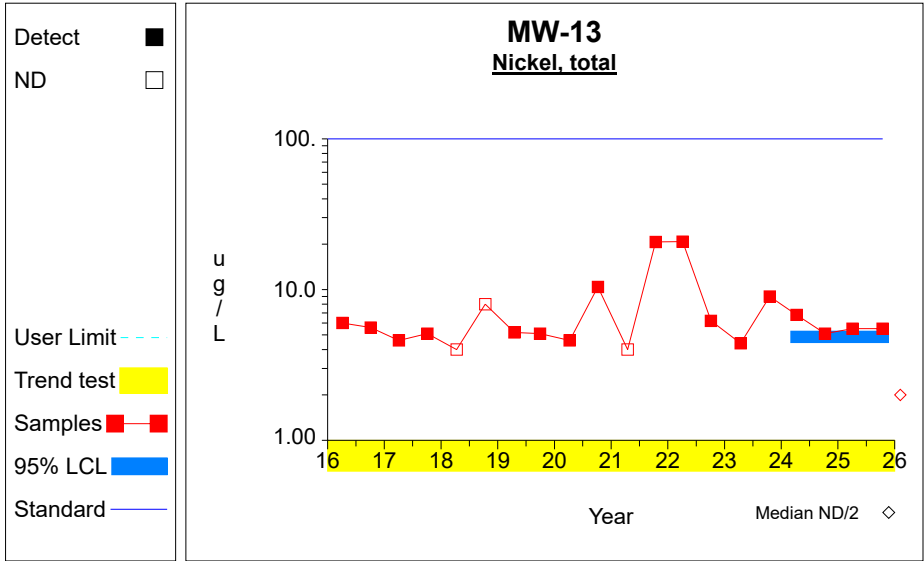
Graph 5



Graph 6



Graph 7



Graph 8

MW-14
Arsenic, total

u g / L

Year

Median ND/2

Detect

ND

User Limit

Trend test

Samples

95% LCL

Standard

MW-14
Barium, total

Y-axis: ug / L

X-axis: Year

Legend:

- Detect (Red square)
- ND (White square)
- User Limit (Blue dashed line)
- Trend test (Yellow shaded area)
- Samples (Red square)
- 95% LCL (Blue shaded area)
- Standard (Blue solid line)

Year	Concentration (ug/L)
16	500
17	450
18	650
19	800
20	1100
21	850
22	2400
23	1100
24	750
25	850
26	850

MW-14
Cobalt, total

Legend:

- Detect: ■
- ND: □
- User Limit: —
- Trend test: ■
- Samples: ■ — ■
- 95% LCL: ■
- Standard: —

Y-axis: ug / L

X-axis: Year

Median ND/2: ◇

Year	Concentration (ug/L)	Category
1996	1.5	Detect
1997	0.8	Detect
1998	3.5	Detect
1999	1.2	Detect
2000	1.8	Detect
2001	1.1	Detect
2002	1.2	Detect
2003	1.0	Detect
2004	0.5	Detect
2005	0.4	ND
2006	0.5	Detect
2007	0.7	Detect
2008	1.8	Detect
2009	2.5	Detect
2010	0.5	Detect
2011	0.4	ND
2012	0.4	ND
2013	0.5	Detect
2014	0.5	Detect
2015	0.5	Detect
2016	0.5	Detect
2017	0.5	Detect
2018	0.5	Detect
2019	0.5	Detect
2020	0.5	Detect
2021	0.2	ND
2022	0.2	ND
2023	0.2	ND
2024	0.2	ND
2025	0.2	ND
2026	0.2	ND

MW-14
Nickel, total

Legend:

- Detect: ■
- ND: □
- User Limit: ---
- Trend test:
- Samples: ■ — ■
- 95% LCL:
- Standard: —

Y-axis: $\mu\text{g} / \text{L}$

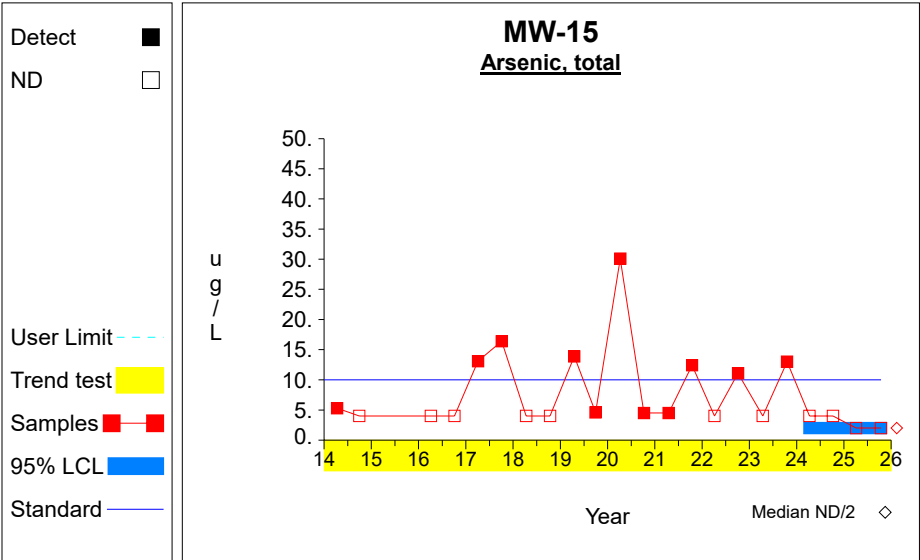
X-axis: Year

Median ND/2 ◇

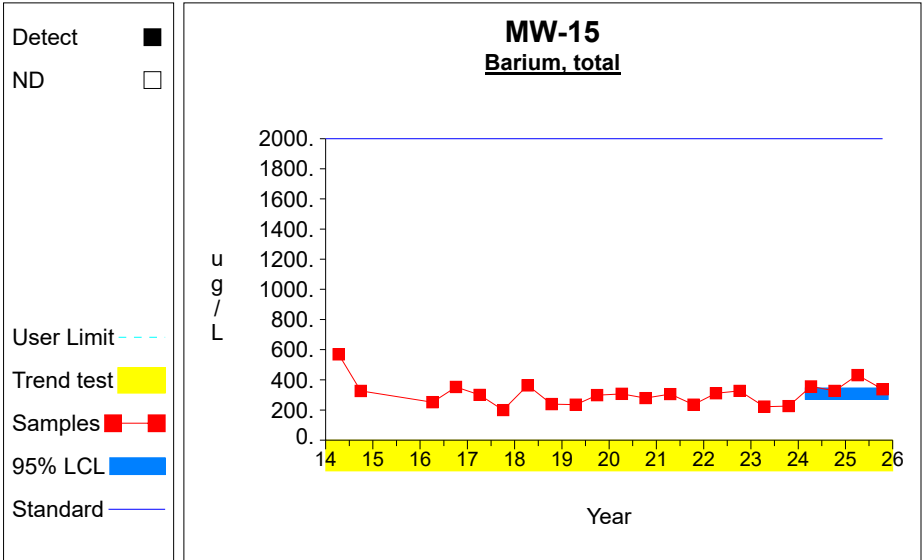
Year	Sample Value ($\mu\text{g} / \text{L}$)	Category
16	5.0	Detect
17	4.0	ND
18	6.0	Detect
19	4.0	ND
20	4.0	ND
21	4.0	ND
22	4.0	ND
23	5.0	Detect
24	4.0	ND
25	4.0	ND
26	5.0	ND

Prepared by: Otter Creek Environmental

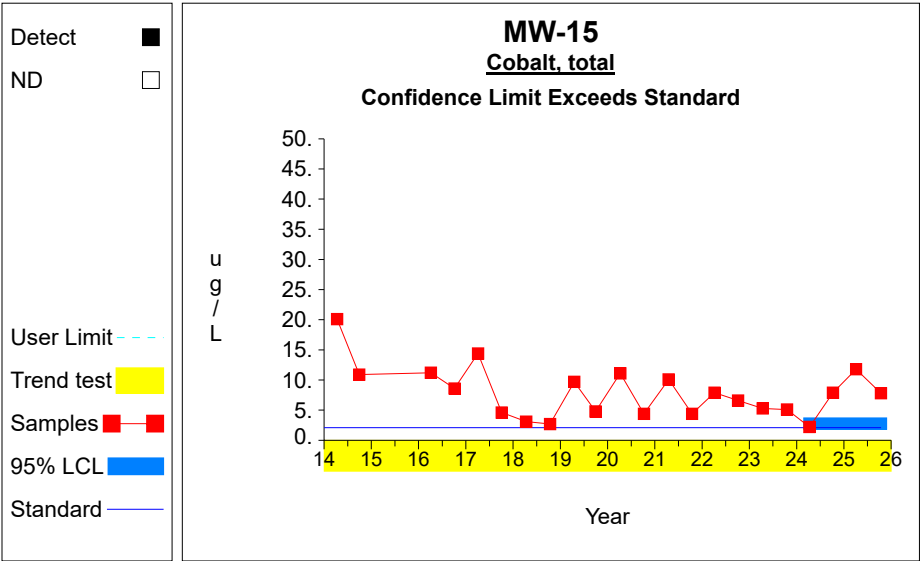
Confidence Limits (Assessment)



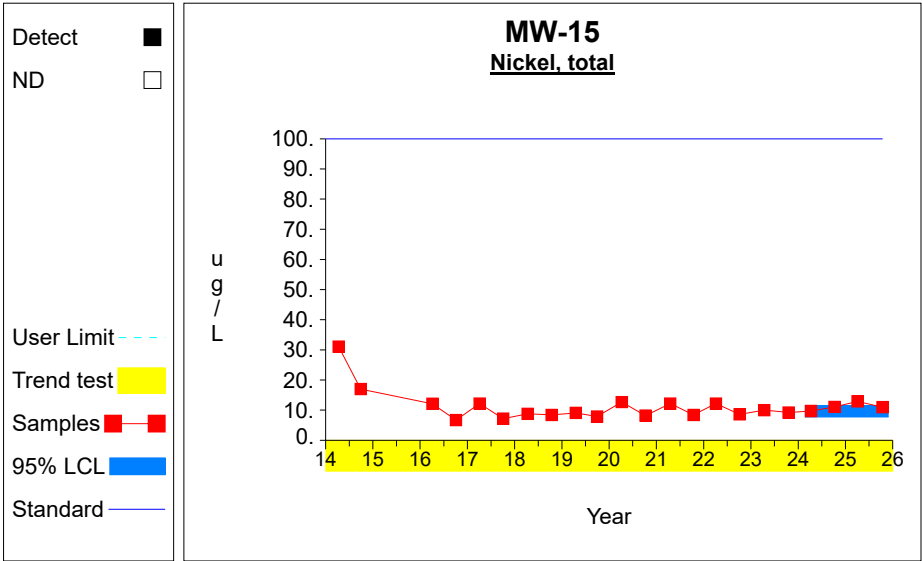
Graph 13



Graph 14

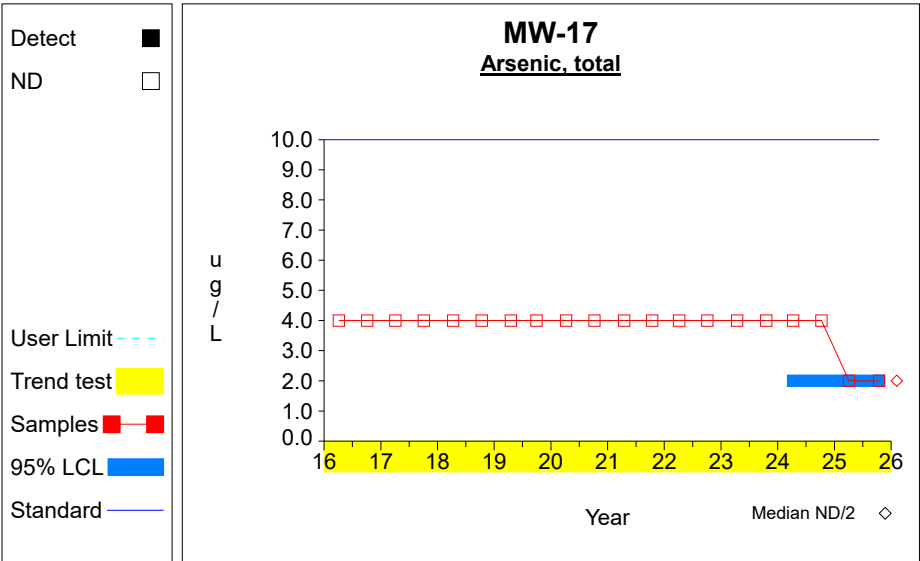


Graph 15

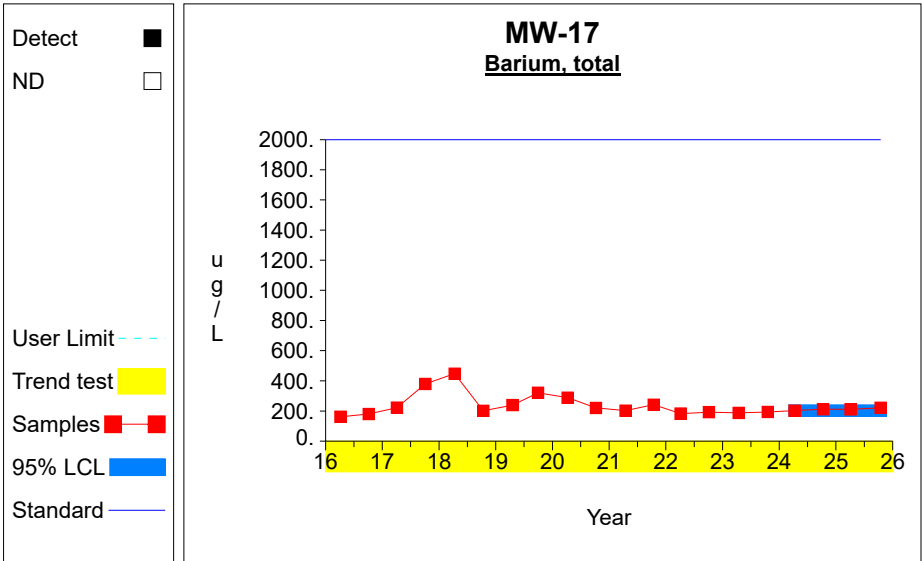


Graph 16

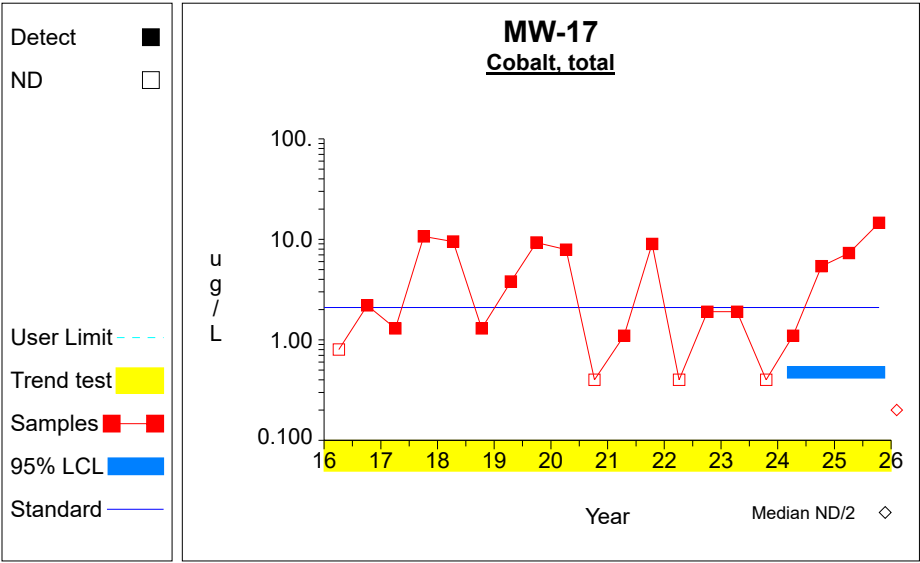
Confidence Limits (Assessment)



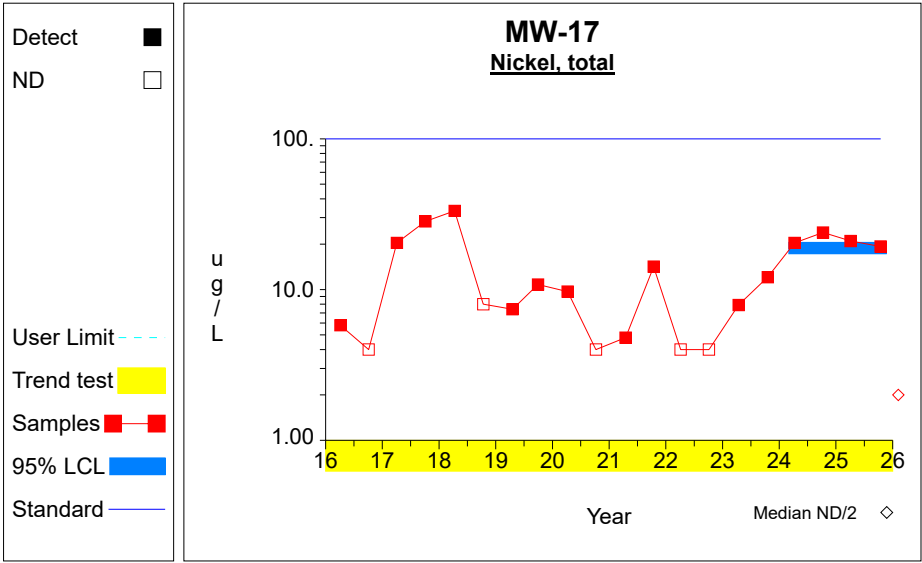
Graph 17



Graph 18



Graph 19



Graph 20

ATTACHMENT D

Ongoing Confidence Limit Evaluation versus GWPS

Well	Date	Compound	Result (ug/L)	Prediction Limit (ug/L)	95% LCL (ug/L)	95% UCL (ug/L)	GWPS (ug/L)
MW-11	10/5/2015	PCE	NT	1.0	---	---	5.0
MW-11	4/4/2016	PCE	<1.0	1.0	---	---	5.0
MW-11	10/4/2016	PCE	1.4	1.0	---	---	5.0
MW-11	4/3/2017	PCE	<1.0	1.0	---	---	5.0
MW-11	10/3/2017	PCE	2.3	1.0	---	---	5.0
MW-11	4/10/2018	PCE	<1.0	1.0	---	---	5.0
MW-11	10/12/2018	PCE	3.1	1.0	0.057	3.143	5.0
MW-11	4/17/2019	PCE	<1.0	1.0	0.057	3.143	5.0
MW-11	9/30/2019	PCE	2.0	1.0	0.036	3.014	5.0
MW-11	4/7/2020	PCE	<1.0	1.0	0.036	3.014	5.0
MW-11	10/7/2020	PCE	<1.0	1.0	0.000	1.757	5.0
MW-11	4/16/2021	PCE	1.4	1.0	0.236	1.964	5.0
MW-11	10/14/2021	PCE	1.4	1.0	0.339	1.561	5.0
MW-11	4/4/2022	PCE	<1.0	1.0	0.339	1.561	5.0
MW-11	10/4/2022	PCE	<1.0	1.0	0.339	1.561	5.0
MW-11	4/13/2023	PCE	2.0	1.0	0.236	1.964	5.0
MW-11	10/18/2023	PCE	1.3	1.0	0.225	1.925	5.0
MW-11	4/8/2024	PCE	<1.0	1.0	0.225	1.925	5.0
MW-11	10/8/2024	PCE	1.1	1.0	0.498	1.952	5.0
MW-11	4/3/2025	PCE	2.0	1.0	0.498	1.952	5.0
MW-11	10/14/2025	PCE	2.1	1.0	0.527	2.323	5.0

Well	Date	Compound	Result (ug/L)	Prediction Limit (ug/L)	95% LCL (ug/L)	95% UCL (ug/L)	GWPS (ug/L)
MW-12	10/5/2015	cis-1,2-dichloroethene	1.2	1.0	---	---	70.0
MW-12	4/4/2016	cis-1,2-dichloroethene	1.4	1.0	---	---	70.0
MW-12	10/4/2016	cis-1,2-dichloroethene	1.1	1.0	---	---	70.0
MW-12	4/3/2017	cis-1,2-dichloroethene	1.8	1.0	---	---	70.0
MW-12	10/3/2017	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-12	4/10/2018	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-12	10/12/2018	cis-1,2-dichloroethene	2.8	1.0	0.087	2.713	70.0
MW-12	4/17/2019	cis-1,2-dichloroethene	1.0	1.0	0.000	2.485	70.0
MW-12	9/30/2019	cis-1,2-dichloroethene	1.1	1.0	0.172	2.528	70.0
MW-12	4/7/2020	cis-1,2-dichloroethene	<1.0	1.0	0.172	2.528	70.0
MW-12	10/7/2020	cis-1,2-dichloroethene	<1.0	1.0	0.398	1.152	70.0
MW-12	4/16/2021	cis-1,2-dichloroethene	<1.0	1.0	0.297	1.003	70.0
MW-12	10/14/2021	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	4/4/2022	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	10/4/2022	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	4/13/2023	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	10/18/2023	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	4/8/2024	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	10/8/2024	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	4/3/2025	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	10/14/2025	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-12	10/5/2015	TCE	3.3	1.0	---	---	5.0
MW-12	4/4/2016	TCE	5.0	1.0	---	---	5.0
MW-12	10/4/2016	TCE	3.8	1.0	---	---	5.0
MW-12	4/3/2017	TCE	4.5	1.0	---	---	5.0
MW-12	10/3/2017	TCE	5.6	1.0	---	---	5.0
MW-12	4/10/2018	TCE	4.9	1.0	---	---	5.0
MW-12	10/12/2018	TCE	5.1	1.0	4.487	5.563	5.0
MW-12	4/17/2019	TCE	3.9	1.0	4.036	5.714	5.0
MW-12	9/30/2019	TCE	2.4	1.0	2.264	5.526	5.0
MW-12	4/7/2020	TCE	3.5	1.0	2.414	5.036	5.0
MW-12	10/7/2020	TCE	2.6	1.0	2.257	3.943	5.0
MW-12	4/16/2021	TCE	2.7	1.0	2.232	3.368	5.0
MW-12	10/14/2021	TCE	2.2	1.0	2.109	3.391	5.0
MW-12	4/4/2022	TCE	2.5	1.0	2.246	2.754	5.0
MW-12	10/4/2022	TCE	3.0	1.0	2.204	2.996	5.0
MW-12	4/13/2023	TCE	2.2	1.0	2.031	2.919	5.0
MW-12	10/18/2023	TCE	2.1	1.0	1.975	2.925	5.0
MW-12	4/8/2024	TCE	<1.0	1.0	0.718	3.182	5.0
MW-12	10/8/2024	TCE	2.2	1.0	0.768	2.732	5.0
MW-12	4/3/2025	TCE	1.8	1.0	0.726	2.574	5.0

MW-12	10/14/2025	TCE	3.1	1.0	0.629	3.171	5.0
MW-12	10/5/2015	PCE	<1.0	1.0	---	---	5.0
MW-12	4/4/2016	PCE	<1.0	1.0	---	---	5.0
MW-12	10/4/2016	PCE	<1.0	1.0	---	---	5.0
MW-12	4/3/2017	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/3/2017	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/10/2018	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/12/2018	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/17/2019	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	9/30/2019	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/7/2020	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/7/2020	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/16/2021	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/14/2021	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/4/2022	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/4/2022	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/13/2023	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	10/18/2023	PCE	<1.0	1.0	0.500	0.500	5.0
MW-12	4/8/2024	PCE	1.8	1.0	0.060	1.590	5.0
MW-12	10/8/2024	PCE	<1.0	1.0	0.060	1.590	5.0
MW-12	4/3/2025	PCE	<1.0	1.0	0.060	1.590	5.0
MW-12	10/14/2025	PCE	<1.0	1.0	0.060	1.590	5.0

Well	Date	Compound	Result (ug/L)	Prediction Limit (ug/L)	95% LCL (ug/L)	95% UCL (ug/L)	GWPS (ug/L)
MW-17	10/5/2015	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-17	4/4/2016	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-17	10/4/2016	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-17	4/3/2017	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-17	10/3/2017	cis-1,2-dichloroethene	1.0	1.0	---	---	70.0
MW-17	4/10/2018	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-17	10/12/2018	cis-1,2-dichloroethene	3.1	1.0	0.000	2.733	70.0
MW-17	4/17/2019	cis-1,2-dichloroethene	<1.0	1.0	0.000	2.733	70.0
MW-17	9/30/2019	cis-1,2-dichloroethene	1.1	1.0	0.000	2.750	70.0
MW-17	4/7/2020	cis-1,2-dichloroethene	<1.0	1.0	0.000	2.750	70.0
MW-17	10/7/2020	cis-1,2-dichloroethene	<1.0	1.0	0.297	1.003	70.0
MW-17	4/16/2021	cis-1,2-dichloroethene	<1.0	1.0	0.297	1.003	70.0
MW-17	10/14/2021	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	4/4/2022	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	10/4/2022	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	4/13/2023	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	10/18/2023	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	4/8/2024	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	10/8/2024	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	4/3/2025	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	10/14/2025	cis-1,2-dichloroethene	<1.0	1.0	0.500	0.500	70.0
MW-17	10/5/2015	PCE	1.7	1.0	---	---	5.0
MW-17	4/4/2016	PCE	1.1	1.0	---	---	5.0
MW-17	10/4/2016	PCE	1.2	1.0	---	---	5.0
MW-17	4/3/2017	PCE	1.6	1.0	---	---	5.0
MW-17	10/3/2017	PCE	1.7	1.0	---	---	5.0
MW-17	4/10/2018	PCE	<1.0	1.0	---	---	5.0
MW-17	10/12/2018	PCE	2.3	1.0	0.643	2.407	5.0
MW-17	4/17/2019	PCE	1.2	1.0	0.527	2.323	5.0
MW-17	9/30/2019	PCE	1.0	1.0	0.357	2.143	5.0
MW-17	4/7/2020	PCE	1.4	1.0	0.800	2.150	5.0
MW-17	10/7/2020	PCE	<1.0	1.0	0.571	1.479	5.0
MW-17	4/16/2021	PCE	1.2	1.0	0.571	1.479	5.0
MW-17	10/14/2021	PCE	<1.0	1.0	0.348	1.452	5.0
MW-17	4/4/2022	PCE	1.2	1.0	0.375	1.325	5.0
MW-17	10/4/2022	PCE	<1.0	1.0	0.375	1.325	5.0
MW-17	4/13/2023	PCE	1.2	1.0	0.375	1.325	5.0
MW-17	10/18/2023	PCE	<1.0	1.0	0.375	1.325	5.0
MW-17	4/8/2024	PCE	1.2	1.0	0.375	1.325	5.0
MW-17	10/8/2024	PCE	<1.0	1.0	0.375	1.325	5.0
MW-17	4/3/2025	PCE	1.2	1.0	0.375	1.325	5.0
MW-17	10/14/2025	PCE	1.3	1.0	0.615	1.485	5.0

Well	Date	Compound	Result (ug/L)	Prediction Limit (ug/L)	95% LCL (ug/L)	95% UCL (ug/L)	GWPS (ug/L)
MW-19	10/5/2015	chloroethane	dry	1.0	---	---	2,800
MW-19	4/4/2016	chloroethane	dry	1.0	---	---	2,800
MW-19	10/4/2016	chloroethane	3.2	1.0	---	---	2,800
MW-19	4/3/2017	chloroethane	2.4	1.0	---	---	2,800
MW-19	10/3/2017	chloroethane	2.2	1.0	---	---	2,800
MW-19	4/10/2018	chloroethane	3.5	1.0	---	---	2,800
MW-19	10/12/2018	chloroethane	2.7	1.0	2.028	3.372	2,800
MW-19	4/17/2019	chloroethane	2.8	1.0	2.170	3.430	2,800
MW-19	9/30/2019	chloroethane	3.2	1.0	2.615	3.485	2,800
MW-19	4/7/2020	chloroethane	2.6	1.0	2.516	3.134	2,800
MW-19	10/7/2020	chloroethane	4.0	1.0	2.422	3.878	2,800
MW-19	4/16/2021	chloroethane	2.1	1.0	2.013	3.937	2,800
MW-19	10/14/2021	chloroethane	2.0	1.0	1.591	3.759	2,800
MW-19	4/4/2022	chloroethane	<1.0	1.0	0.463	3.837	2,800
MW-19	10/4/2022	chloroethane	1.7	1.0	0.709	2.441	2,800
MW-19	4/13/2023	chloroethane	<1.0	1.0	0.247	2.103	2,800
MW-19	10/18/2023	chloroethane	dry	1.0	0.247	2.103	2,800
MW-19	4/8/2024	chloroethane	dry	1.0	0.247	2.103	2,800
MW-19	10/8/2024	chloroethane	dry	1.0	0.247	2.103	2,800
MW-19	4/3/2025	chloroethane	dry	1.0	0.247	2.103	2,800
MW-19	10/14/2025	chloroethane	dry	1.0	0.247	2.103	2,800
MW-19	10/5/2015	acetone	dry	10.0	---	---	6,300
MW-19	4/4/2016	acetone	dry	10.0	---	---	6,300
MW-19	10/4/2016	acetone	19.0	10.0	---	---	6,300
MW-19	4/3/2017	acetone	49.6	10.0	---	---	6,300
MW-19	10/3/2017	acetone	<10.0	10.0	---	---	6,300
MW-19	4/10/2018	acetone	<10.0	10.0	---	---	6,300
MW-19	10/12/2018	acetone	13.0	10.0	0.000	43.209	6,300
MW-19	4/17/2019	acetone	<10.0	10.0	2.295	11.705	6,300
MW-19	9/30/2019	acetone	<10.0	10.0	2.295	11.705	6,300
MW-19	4/7/2020	acetone	<10.0	10.0	2.295	11.705	6,300
MW-19	10/7/2020	acetone	<10.0	10.0	5.000	5.000	6,300
MW-19	4/16/2021	acetone	<10.0	10.0	5.000	5.000	6,300
MW-19	10/14/2021	acetone	<10.0	10.0	5.000	5.000	6,300
MW-19	4/4/2022	acetone	35.2	10.0	0.000	30.312	6,300
MW-19	10/4/2022	acetone	17.0	10.0	3.193	27.907	6,300
MW-19	4/13/2023	acetone	<10.0	10.0	0.000	32.335	6,300
MW-19	10/18/2023	acetone	dry	10.0	0.000	32.335	6,300
MW-19	4/8/2024	acetone	dry	10.0	0.000	32.335	6,300
MW-19	10/8/2024	acetone	dry	10.0	0.000	32.335	6,300
MW-19	4/3/2025	acetone	dry	10.0	0.000	32.335	6,300

MW-19	10/14/2025	acetone	dry	10.0	0.000	32.335	6,300
MW-19	10/5/2015	1,1--dichloroethane	dry	1.0	---	---	140.0
MW-19	4/4/2016	1,1--dichloroethane	dry	1.0	---	---	140.0
MW-19	10/4/2016	1,1--dichloroethane	3.2	1.0	---	---	140.0
MW-19	4/3/2017	1,1--dichloroethane	6.3	1.0	---	---	140.0
MW-19	10/3/2017	1,1--dichloroethane	3.1	1.0	---	---	140.0
MW-19	4/10/2018	1,1--dichloroethane	3.6	1.0	---	---	140.0
MW-19	10/12/2018	1,1--dichloroethane	4.2	1.0	2.645	5.955	140.0
MW-19	4/17/2019	1,1--dichloroethane	5.2	1.0	2.963	5.087	140.0
MW-19	9/30/2019	1,1--dichloroethane	6.4	1.0	3.408	6.292	140.0
MW-19	4/7/2020	1,1--dichloroethane	5.4	1.0	4.239	6.361	140.0
MW-19	10/7/2020	1,1--dichloroethane	9.3	1.0	4.351	8.799	140.0
MW-19	4/16/2021	1,1--dichloroethane	3.7	1.0	3.438	8.962	140.0
MW-19	10/14/2021	1,1--dichloroethane	3.8	1.0	2.470	8.630	140.0
MW-19	4/4/2022	1,1--dichloroethane	1.3	1.0	0.541	8.509	140.0
MW-19	10/4/2022	1,1--dichloroethane	2.4	1.0	1.405	4.195	140.0
MW-19	4/13/2023	1,1--dichloroethane	<1.0	1.0	0.317	3.683	140.0
MW-19	10/18/2023	1,1--dichloroethane	dry	1.0	0.317	3.683	140.0
MW-19	4/8/2024	1,1--dichloroethane	dry	1.0	0.317	3.683	140.0
MW-19	10/8/2024	1,1--dichloroethane	dry	1.0	0.317	3.683	140.0
MW-19	4/3/2025	1,1--dichloroethane	dry	1.0	0.317	3.683	140.0
MW-19	10/14/2025	1,1--dichloroethane	dry	1.0	0.317	3.683	140.0
MW-19	10/5/2015	cis-1,2-dichloroethene	dry	1.0	---	---	70.0
MW-19	4/4/2016	cis-1,2-dichloroethene	dry	1.0	---	---	70.0
MW-19	10/4/2016	cis-1,2-dichloroethene	23.4	1.0	---	---	70.0
MW-19	4/3/2017	cis-1,2-dichloroethene	4.5	1.0	---	---	70.0
MW-19	10/3/2017	cis-1,2-dichloroethene	36.0	1.0	---	---	70.0
MW-19	4/10/2018	cis-1,2-dichloroethene	46.2	1.0	---	---	70.0
MW-19	10/12/2018	cis-1,2-dichloroethene	34.7	1.0	9.195	51.505	70.0
MW-19	4/17/2019	cis-1,2-dichloroethene	43.1	1.0	33.481	46.519	70.0
MW-19	9/30/2019	cis-1,2-dichloroethene	39.9	1.0	35.198	46.752	70.0
MW-19	4/7/2020	cis-1,2-dichloroethene	54.4	1.0	33.219	52.831	70.0
MW-19	10/7/2020	cis-1,2-dichloroethene	98.0	1.0	27.289	90.411	70.0
MW-19	4/16/2021	cis-1,2-dichloroethene	23.4	1.0	16.288	91.562	70.0
MW-19	10/14/2021	cis-1,2-dichloroethene	26.8	1.0	10.087	91.213	70.0
MW-19	4/4/2022	cis-1,2-dichloroethene	6.6	1.0	0.000	86.349	70.0
MW-19	10/4/2022	cis-1,2-dichloroethene	7.6	1.0	3.758	28.442	70.0
MW-19	4/13/2023	cis-1,2-dichloroethene	1.8	1.0	0.000	23.672	70.0
MW-19	10/18/2023	cis-1,2-dichloroethene	dry	1.0	0.000	23.672	70.0
MW-19	4/8/2024	cis-1,2-dichloroethene	dry	1.0	0.000	23.672	70.0
MW-19	10/8/2024	cis-1,2-dichloroethene	dry	1.0	0.000	23.672	70.0
MW-19	4/3/2025	cis-1,2-dichloroethene	dry	1.0	0.000	23.672	70.0
MW-19	10/14/2025	cis-1,2-dichloroethene	dry	1.0	0.000	23.672	70.0
MW-19	10/5/2015	benzene	dry	1.0	---	---	5.0

MW-19	4/4/2016	benzene	dry	1.0	---	---	5.0
MW-19	10/4/2016	benzene	1.1	1.0	---	---	5.0
MW-19	4/3/2017	benzene	<1.0	1.0	---	---	5.0
MW-19	10/3/2017	benzene	<1.0	1.0	---	---	5.0
MW-19	4/10/2018	benzene	<1.0	1.0	---	---	5.0
MW-19	10/12/2018	benzene	<1.0	1.0	0.500	0.500	5.0
MW-19	4/17/2019	benzene	1.1	1.0	0.297	1.003	5.0
MW-19	9/30/2019	benzene	<1.0	1.0	0.297	1.003	5.0
MW-19	4/7/2020	benzene	1.5	1.0	0.324	1.476	5.0
MW-19	10/7/2020	benzene	3.1	1.0	0.242	2.858	5.0
MW-19	4/16/2021	benzene	1.7	1.0	0.440	2.960	5.0
MW-19	10/14/2021	benzene	<1.0	1.0	0.440	2.960	5.0
MW-19	4/4/2022	benzene	<1.0	1.0	0.000	2.905	5.0
MW-19	10/4/2022	benzene	<1.0	1.0	0.094	1.506	5.0
MW-19	4/13/2023	benzene	<1.0	1.0	0.500	.500	5.0
MW-19	10/18/2023	benzene	dry	1.0	0.500	.500	5.0
MW-19	4/8/2024	benzene	dry	1.0	0.500	.500	5.0
MW-19	10/8/2024	benzene	dry	1.0	0.500	.500	5.0
MW-19	4/3/2025	benzene	dry	1.0	0.500	.500	5.0
MW-19	10/14/2025	benzene	dry	1.0	0.500	.500	5.0
MW-19	10/5/2015	TCE	dry	1.0	---	---	5.0
MW-19	4/4/2016	TCE	dry	1.0	---	---	5.0
MW-19	10/4/2016	TCE	2.8	1.0	---	---	5.0
MW-19	4/3/2017	TCE	7.9	1.0	---	---	5.0
MW-19	10/3/2017	TCE	<1.0	1.0	---	---	5.0
MW-19	4/10/2018	TCE	<1.0	1.0	---	---	5.0
MW-19	10/12/2018	TCE	5.1	1.0	0.000	7.791	5.0
MW-19	4/17/2019	TCE	3.9	1.0	0.000	5.277	5.0
MW-19	9/30/2019	TCE	11.8	1.0	0.000	10.896	5.0
MW-19	4/7/2020	TCE	2.2	1.0	0.804	10.696	5.0
MW-19	10/7/2020	TCE	2.0	1.0	0.000	10.420	5.0
MW-19	4/16/2021	TCE	10.6	1.0	0.442	12.858	5.0
MW-19	10/14/2021	TCE	3.6	1.0	0.000	9.379	5.0
MW-19	4/4/2022	TCE	2.1	1.0	0.000	9.378	5.0
MW-19	10/4/2022	TCE	5.1	1.0	0.988	9.712	5.0
MW-19	4/13/2023	TCE	2.3	1.0	1.644	4.906	5.0
MW-19	10/18/2023	TCE	dry	1.0	1.644	4.906	5.0
MW-19	4/8/2024	TCE	dry	1.0	1.644	4.906	5.0
MW-19	10/8/2024	TCE	dry	1.0	1.644	4.906	5.0
MW-19	4/3/2025	TCE	dry	1.0	1.644	4.906	5.0
MW-19	10/14/2025	TCE	dry	1.0	1.644	4.906	5.0
MW-19	10/5/2015	PCE	dry	1.0	---	---	5.0
MW-19	4/4/2016	PCE	dry	1.0	---	---	5.0
MW-19	10/4/2016	PCE	6.6	1.0	---	---	5.0

MW-19	4/3/2017	PCE	43.2	1.0	---	---	5.0
MW-19	10/3/2017	PCE	<1.0	1.0	---	---	5.0
MW-19	4/10/2018	PCE	<1.0	1.0	---	---	5.0
MW-19	10/12/2018	PCE	2.8	1.0	0.000	36.446	5.0
MW-19	4/17/2019	PCE	1.9	1.0	0.096	2.754	5.0
MW-19	9/30/2019	PCE	<1.0	1.0	0.096	2.754	5.0
MW-19	4/7/2020	PCE	<1.0	1.0	0.096	2.754	5.0
MW-19	10/7/2020	PCE	<1.0	1.0	0.027	1.673	5.0
MW-19	4/16/2021	PCE	<1.0	1.0	0.500	0.500	5.0
MW-19	10/14/2021	PCE	1.0	1.0	0.331	0.919	5.0
MW-19	4/4/2022	PCE	<1.0	1.0	0.331	0.919	5.0
MW-19	10/4/2022	PCE	<1.0	1.0	0.331	0.919	5.0
MW-19	4/13/2023	PCE	<1.0	1.0	0.331	0.919	5.0
MW-19	10/18/2023	PCE	dry	1.0	0.331	0.919	5.0
MW-19	4/8/2024	PCE	dry	1.0	0.331	0.919	5.0
MW-19	10/8/2024	PCE	dry	1.0	0.331	0.919	5.0
MW-19	4/3/2025	PCE	dry	1.0	0.331	0.919	5.0
MW-19	10/14/2025	PCE	dry	1.0	0.331	0.919	5.0

Well	Date	Compound	Result (ug/L)	Prediction Limit (ug/L)	95% LCL (ug/L)	95% UCL (ug/L)	GWPS (ug/L)
MW-20	10/5/2015	acetone	dry	10.0	---	---	6,300
MW-20	4/4/2016	acetone	dry	10.0	---	---	6,300
MW-20	10/4/2016	acetone	72.9	10.0	---	---	6,300
MW-20	4/3/2017	acetone	10.4	10.0	---	---	6,300
MW-20	10/3/2017	acetone	34.0	10.0	---	---	6,300
MW-20	4/10/2018	acetone	32.9	10.0	---	---	6,300
MW-20	10/12/2018	acetone	28.7	10.0	13.592	39.408	6,300
MW-20	4/17/2019	acetone	27.2	10.0	26.859	34.541	6,300
MW-20	9/30/2019	acetone	<10.0	10.0	8.706	38.194	6,300
MW-20	4/7/2020	acetone	<10.0	10.0	0.872	32.078	6,300
MW-20	10/7/2020	acetone	<10.0	10.0	0.000	23.607	6,300
MW-20	4/16/2021	acetone	<10.0	10.0	5.000	5.000	6,300
MW-20	10/14/2021	acetone	180.0	10.0	0.000	151.675	6,300
MW-20	4/4/2022	acetone	dry	10.0	0.000	151.675	6,300
MW-20	10/4/2022	acetone	dry	10.0	0.000	151.675	6,300
MW-20	4/13/2023	acetone	dry	10.0	0.000	151.675	6,300
MW-20	10/18/2023	acetone	dry	10.0	0.000	151.675	6,300
MW-20	4/8/2024	acetone	dry	10.0	0.000	151.675	6,300
MW-20	10/8/2024	acetone	dry	10.0	0.000	151.675	6,300
MW-20	4/3/2025	acetone	dry	10.0	0.000	151.675	6,300
MW-20	10/14/2025	acetone	dry	10.0	0.000	151.675	6,300
MW-20	10/5/2015	cis-1,2-dichloroethene	dry	1.0	---	---	70.0
MW-20	4/4/2016	cis-1,2-dichloroethene	dry	1.0	---	---	70.0
MW-20	10/4/2016	cis-1,2-dichloroethene	1.0	1.0	---	---	70.0
MW-20	4/3/2017	cis-1,2-dichloroethene	1.1	1.0	---	---	70.0
MW-20	10/3/2017	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-20	4/10/2018	cis-1,2-dichloroethene	<1.0	1.0	---	---	70.0
MW-20	10/12/2018	cis-1,2-dichloroethene	6.0	1.0	0.000	5.160	70.0
MW-20	4/17/2019	cis-1,2-dichloroethene	3.8	1.0	0.000	5.869	70.0
MW-20	9/30/2019	cis-1,2-dichloroethene	3.7	1.0	0.837	6.163	70.0
MW-20	4/7/2020	cis-1,2-dichloroethene	3.4	1.0	2.819	5.631	70.0
MW-20	10/7/2020	cis-1,2-dichloroethene	9.1	1.0	1.779	8.221	70.0
MW-20	4/16/2021	cis-1,2-dichloroethene	4.5	1.0	2.049	8.301	70.0
MW-20	10/14/2021	cis-1,2-dichloroethene	3.9	1.0	2.141	8.309	70.0
MW-20	4/4/2022	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	10/4/2022	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	4/13/2023	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	10/18/2023	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	4/8/2024	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	10/8/2024	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	4/3/2025	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0
MW-20	10/14/2025	cis-1,2-dichloroethene	dry	1.0	2.141	8.309	70.0

MW-20	10/5/2015	TCE	dry	1.0	---	---	5.0
MW-20	4/4/2016	TCE	dry	1.0	---	---	5.0
MW-20	10/4/2016	TCE	<1.0	1.0	---	---	5.0
MW-20	4/3/2017	TCE	<1.0	1.0	---	---	5.0
MW-20	10/3/2017	TCE	2.2	1.0	---	---	5.0
MW-20	4/10/2018	TCE	<1.0	1.0	---	---	5.0
MW-20	10/12/2018	TCE	1.7	1.0	0.052	3.098	5.0
MW-20	4/17/2019	TCE	3.1	1.0	0.599	3.151	5.0
MW-20	9/30/2019	TCE	<1.0	1.0	0.000	2.905	5.0
MW-20	4/7/2020	TCE	1.1	1.0	0.290	2.910	5.0
MW-20	10/7/2020	TCE	<1.0	1.0	0.274	1.626	5.0
MW-20	4/16/2021	TCE	<1.0	1.0	0.297	1.003	5.0
MW-20	10/14/2021	TCE	<1.0	1.0	0.297	1.003	5.0
MW-20	4/4/2022	TCE	dry	1.0	0.297	1.003	5.0
MW-20	10/4/2022	TCE	dry	1.0	0.297	1.003	5.0
MW-20	4/13/2023	TCE	dry	1.0	0.297	1.003	5.0
MW-20	10/18/2023	TCE	dry	1.0	0.297	1.003	5.0
MW-20	4/8/2024	TCE	dry	1.0	0.297	1.003	5.0
MW-20	10/8/2024	TCE	dry	1.0	0.297	1.003	5.0
MW-20	4/3/2025	TCE	dry	1.0	0.297	1.003	5.0
MW-20	10/14/2025	TCE	dry	1.0	0.297	1.003	5.0
MW-20	10/5/2015	toluene	dry	1.0	---	---	1,000.
MW-20	4/4/2016	toluene	dry	1.0	---	---	1,000.
MW-20	10/4/2016	toluene	6.7	1.0	---	---	1,000.
MW-20	4/3/2017	toluene	1.3	1.0	---	---	1,000.
MW-20	10/3/2017	toluene	<1.0	1.0	---	---	1,000.
MW-20	4/10/2018	toluene	<1.0	1.0	---	---	1,000.
MW-20	10/12/2018	toluene	<1.0	1.0	0.229	1.171	1,000.
MW-20	4/17/2019	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	9/30/2019	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	4/7/2020	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	10/7/2020	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	4/16/2021	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	10/14/2021	toluene	<1.0	1.0	0.500	0.500	1,000.
MW-20	4/4/2022	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	10/4/2022	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	4/13/2023	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	10/18/2023	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	4/8/2024	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	10/8/2024	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	4/3/2025	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	10/14/2025	toluene	dry	1.0	0.500	0.500	1,000.
MW-20	10/5/2015	PCE	dry	1.0	---	---	5.0
MW-20	4/4/2016	PCE	dry	1.0	---	---	5.0

MW-20	10/4/2016	PCE	<1.0	1.0	---	---	5.0
MW-20	4/3/2017	PCE	<1.0	1.0	---	---	5.0
MW-20	10/3/2017	PCE	1.7	1.0	---	---	5.0
MW-20	4/10/2018	PCE	<1.0	1.0	---	---	5.0
MW-20	10/12/2018	PCE	<1.0	1.0	0.094	1.506	5.0
MW-20	4/17/2019	PCE	<1.0	1.0	0.094	1.506	5.0
MW-20	9/30/2019	PCE	<1.0	1.0	0.500	0.500	5.0
MW-20	4/7/2020	PCE	<1.0	1.0	0.500	0.500	5.0
MW-20	10/7/2020	PCE	<1.0	1.0	0.500	0.500	5.0
MW-20	4/16/2021	PCE	<1.0	1.0	0.500	0.500	5.0
MW-20	10/14/2021	PCE	<1.0	1.0	0.500	0.500	5.0
MW-20	4/4/2022	PCE	dry	1.0	0.500	0.500	5.0
MW-20	4/4/2022	PCE	dry	1.0	0.500	0.500	5.0
MW-20	4/13/2023	PCE	dry	1.0	0.500	0.500	5.0
MW-20	10/18/2023	PCE	dry	1.0	0.500	0.500	5.0
MW-20	4/8/2024	PCE	dry	1.0	0.500	0.500	5.0
MW-20	10/8/2024	PCE	dry	1.0	0.500	0.500	5.0
MW-20	4/3/2025	PCE	dry	1.0	0.500	0.500	5.0
MW-20	10/14/2025	PCE	dry	1.0	0.500	0.500	5.0

ATTACHMENT E

Water Elevation Data

Table 8.--- Water-level data, Jackson County Sanitary Landfill. TOC, top of casing.

Monitor Well/ TOC Elev. (ft)	Screened Interval Depth (ft)	Elev. (ft)	Water Level	9/29/94	12/27/94	4/6/95	7/28/95	4/17/96	10/14/96	4/22/97	9/25/97
90MW-10 919.16	104.7	814.5	Depth (ft)	89.67	91.59	93.27	91.40	94.30	93.00	94.10	94.0
	114.7	804.5	Elev. (ft)	829.49	827.57	825.89	827.76	824.86	826.16	825.06	825.16
90MW-12 898.17	104.9	793.3	Depth (ft)	89.86	91.01	92.40	92.67	93.80	93.50	93.40	94.10
	109.9	788.3	Elev. (ft)	808.31	807.16	805.77	805.50	804.37	804.67	804.77	804.07
90MW-13 882.02	37.1	844.9	Depth (ft)	36.27	36.62	36.96	35.93	36.75	35.90	36.00	35.75
	47.1	834.9	Elev. (ft)	845.75	845.40	845.06	846.09	845.27	846.12	846.02	846.27
90MW-14 849.18	49.2	800.0	Depth (ft)	42.39	44.13	45.38	43.56	46.80	45.30	46.20	45.80
	69.2	780.0	Elev. (ft)	806.79	805.05	803.80	805.62	802.38	803.88	802.98	803.38
90MW-15 849.91	11.1	838.8	Depth (ft)	10.08	5.92	4.54	9.05	8.20	11.20	4.10	8.40
	21.1	828.8	Elev. (ft)	839.83	843.99	845.37	840.86	841.71	838.71	845.81	841.51
90MW-16 879.76	79.3	800.5	Depth (ft)	66.17	67.89	69.35	66.97	70.90	69.10	69.60	69.40
	89.3	790.5	Elev. (ft)	813.59	811.87	810.41	812.79	808.86	810.66	810.16	810.4
90MW-17 879.05	34.8	844.3	Depth (ft)	30.02	30.40	30.66	28.19	30.38	29.15	30.30	29.65
	44.8	834.3	Elev. (ft)	849.03	848.65	848.39	850.86	848.67	849.90	848.75	849.4
90MW-19 895.98	69.00	826.98	Depth (ft)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	79.00	816.98	Elev. (ft)	---	---	---	---	---	---	---	---
90MW-20 881.86	69.47	812.39	Depth (ft)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	79.47	802.39	Elev. (ft)	---	---	---	---	---	---	---	---
05MW-21 849.01	10.0	839.0	Depth (ft)								
	15.0	834.0	Elev. (ft)								

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval Depth (ft)	Elev. (ft)	Water Level	4/17/98	9/22/98	4/1/99	9/24/99	4/13/00	9/28/00	4/5/01	9/28/01
90MW-10	104.7	814.5	Depth (ft)	92.82	88.79	84.47	84.41	89.03	89.63	87.88	90.75
919.16	114.7	804.5	Elev. (ft)	826.34	830.37	834.69	834.75	830.13	829.53	831.28	828.41
90MW-12	104.9	793.3	Depth (ft)	95.12	92.53	88.76	87.75	90.50	91.48	92.08	91.81
898.17	109.9	788.3	Elev. (ft)	803.05	805.64	809.41	810.42	807.67	806.69	806.09	806.36
90MW-13	37.1	844.9	Depth (ft)	36.05	34.87	34.52	34.76	35.54	35.83	35.60	35.55
882.02	47.1	834.9	Elev. (ft)	845.97	847.15	847.50	847.26	846.48	846.19	846.42	846.47
90MW-14	49.2	800.0	Depth (ft)	45.30	42.40	39.03	39.26	43.59	43.73	42.64	44.25
849.18	69.2	780.0	Elev. (ft)	803.88	806.78	810.15	809.92	805.59	805.45	806.54	804.93
90MW-15	11.1	838.8	Depth (ft)	3.44	6.75	7.39	11.86	11.06	9.88	4.95	9.11
849.91	21.1	828.8	Elev. (ft)	846.47	843.16	842.52	838.05	838.85	840.03	844.96	840.80
90MW-16	79.3	800.5	Depth (ft)	65.03	83.63	62.31	63.07	66.96	66.79	63.44	67.54
879.76	89.3	790.5	Elev. (ft)	814.73	796.13	817.45	816.69	812.80	812.97	816.32	812.22
90MW-17	34.8	844.3	Depth (ft)	27.26	27.18	27.85	28.61	30.25	29.74	30.65	30.15
879.05	44.8	834.3	Elev. (ft)	851.79	851.87	851.20	850.44	848.80	849.31	848.40	848.90
90MW-19	69.00	826.98	Depth (ft)	DRY	DRY	75.75	75.15	DRY	DRY	DRY	DRY
895.98	79.00	816.98	Elev. (ft)	---	---	820.23	820.83	---	---	---	---
90MW-20	69.47	812.39	Depth (ft)	DRY	DRY	77.60	76.92	DRY	DRY	DRY	DRY
881.86	79.47	802.39	Elev. (ft)	---	---	804.26	804.94	---	---	---	---
05MW-21	10.0	839.0	Depth (ft)								
849.01	15.0	834.0	Elev. (ft)								

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval		Water Level								
	Depth (ft)	Elev. (ft)		4/18/02	9/24/02	4/10/03	9/11/03	4/6/04	9/22/04	4/8/05	9/19/05
90MW-10 919.16	104.7	814.5	Depth (ft)	92.68	91.71	93.09	93.92	93.51	91.98	92.59	94.95
	114.7	804.5	Elev. (ft)	826.48	827.45	826.07	825.24	825.65	827.18	826.57	824.21
90MW-12 898.17	104.9	793.3	Depth (ft)	93.31	93.14	93.06	93.85	94.55	92.90	93.14	93.82
	109.9	788.3	Elev. (ft)	804.86	805.03	805.11	804.32	803.62	805.27	805.03	804.35
90MW-13 882.02	37.1	844.9	Depth (ft)	35.61	35.21	35.41	35.51	35.36	34.90	35.08	35.41
	47.1	834.9	Elev. (ft)	846.41	846.81	846.61	846.51	846.66	847.12	846.94	846.61
90MW-14 849.18	49.2	800.0	Depth (ft)	45.27	44.94	45.76	46.20	45.21	44.38	44.61	46.07
	69.2	780.0	Elev. (ft)	803.91	804.24	803.42	802.98	803.97	804.80	804.57	803.11
90MW-15 849.91	11.1	838.8	Depth (ft)	3.97	10.28	7.71	11.72	4.16	11.94	5.70	13.09
	21.1	828.8	Elev. (ft)	845.94	839.63	842.20	838.19	845.75	837.97	844.21	836.82
90MW-16 879.76	79.3	800.5	Depth (ft)	67.55	68.16	69.63	69.87	66.41	67.73	67.88	70.19
	89.3	790.5	Elev. (ft)	812.21	811.60	810.13	809.89	813.35	812.03	811.88	809.57
90MW-17 879.05	34.8	844.3	Depth (ft)	29.97	28.94	30.08	29.45	28.89	28.79	29.94	30.35
	44.8	834.3	Elev. (ft)	849.08	850.11	848.97	849.60	850.16	850.26	849.11	848.70
90MW-19 895.98	69.00	826.98	Depth (ft)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	79.00	816.98	Elev. (ft)	---	---	---	---	---	---	---	---
90MW-20 881.86	69.47	812.39	Depth (ft)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	79.47	802.39	Elev. (ft)	---	---	---	---	---	---	---	---
05MW-21 849.01	10.0	839.0	Depth (ft)								14.20
	15.0	834.0	Elev. (ft)								834.81

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval Depth (ft)	Elev. (ft)	Water Level	Date							
				4/11/06	9/20/06	3/29/07	9/29/07	4/5/08	10/2/08	3/17/09	9/28/09
90MW-10	104.7	814.5	Depth (ft)	97.67	99.09	97.24	92.64	86.73	80.03	79.91	78.19
919.16	114.7	804.5	Elev. (ft)	821.49	820.07	821.92	826.52	832.43	839.13	839.25	840.97
90MW-12	104.9	793.3	Depth (ft)	95.35	96.35	96.57	93.19	91.43	83.35	84.79	82.93
898.17	109.9	788.3	Elev. (ft)	802.82	801.82	801.60	804.98	806.74	814.82	813.38	815.24
90MW-13	37.1	844.9	Depth (ft)	35.98	35.92	35.61	34.80	34.51	33.88	34.38	34.09
882.02	47.1	834.9	Elev. (ft)	846.04	846.10	846.41	847.22	847.51	848.14	847.64	847.93
90MW-14	49.2	800.0	Depth (ft)	47.58	47.79	46.62	43.51	39.73	34.49	34.81	33.70
849.18	69.2	780.0	Elev. (ft)	801.60	801.39	802.56	805.67	809.45	814.69	814.37	815.48
90MW-15	11.1	838.8	Depth (ft)	5.40	7.16	4.18	9.85	2.84	9.13	3.84	9.62
849.91	21.1	828.8	Elev. (ft)	844.51	842.75	845.73	840.06	847.07	840.78	846.07	840.29
90MW-16	79.3	800.5	Depth (ft)	71.95	72.26	68.66	66.62	59.29	56.91	54.77	55.72
879.76	89.3	790.5	Elev. (ft)	807.81	807.50	811.10	813.14	820.47	822.85	824.99	824.04
90MW-17	34.8	844.3	Depth (ft)	30.88	30.21	29.58	28.87	28.80	28.06	29.60	27.75
879.05	44.8	834.3	Elev. (ft)	848.17	848.84	849.47	850.18	850.25	850.99	849.45	851.30
90MW-19	69.00	826.98	Depth (ft)	DRY	DRY	DRY	DRY	DRY	---	71.65	69.71
895.98	79.00	816.98	Elev. (ft)	---	---	---	---	---	---	824.33	826.27
90MW-20	69.47	812.39	Depth (ft)	DRY	DRY	DRY	DRY	DRY	---	74.00	70.09
881.86	79.47	802.39	Elev. (ft)	---	---	---	---	---	---	807.86	811.77
05MW-21	10.0	839.0	Depth (ft)	8.31	8.81	7.69	11.78	6.08	10.59	7.55	11.02
849.01	15.0	834.0	Elev. (ft)	840.70	840.20	841.32	837.23	842.93	838.42	841.46	837.99

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval Depth (ft)	Elev. (ft)	Water Level								
				4/5/10	9/20/10	3/17/11	9/20/11	4/17/12	9/15/12	4/5/13	9/16/13
90MW-10	104.7	814.5	Depth (ft)	---	73.49	75.04	75.85	80.38	84.08	87.78	88.68
	919.16	114.7	Elev. (ft)	---	845.67	844.12	843.31	838.78	835.08	831.38	830.48
90MW-12	104.9	793.3	Depth (ft)	81.45	80.07	82.73	82.18	85.78	87.54	90.50	90.31
	898.17	109.9	Elev. (ft)	816.72	818.10	815.44	815.99	812.39	810.63	807.67	807.86
90MW-13	37.1	844.9	Depth (ft)	34.02	33.83	34.38	34.21	34.84	35.10	35.77	35.45
	882.02	47.1	Elev. (ft)	848.00	848.19	847.64	847.81	847.18	846.92	846.25	846.57
90MW-14	49.2	800.0	Depth (ft)	32.74	32.05	33.25	34.02	36.89	39.88	42.40	42.15
	849.18	69.2	Elev. (ft)	816.44	817.13	815.93	815.16	812.29	809.30	806.78	807.03
90MW-15	11.1	838.8	Depth (ft)	5.26	10.08	3.63	9.72	5.85	13.02	6.14	11.63
	849.91	21.1	Elev. (ft)	844.65	839.83	846.28	840.19	844.06	836.89	843.77	838.28
90MW-16	79.3	800.5	Depth (ft)	54.46	54.25	54.12	56.05	59.06	63.30	64.38	65.32
	879.76	89.3	Elev. (ft)	825.30	825.51	825.64	823.71	820.70	816.46	815.38	814.44
90MW-17	34.8	844.3	Depth (ft)	28.59	27.97	29.41	28.76	29.38	29.77	30.54	30.04
	879.05	44.8	Elev. (ft)	850.46	851.08	849.64	850.29	849.67	849.28	848.51	849.01
90MW-19	69.00	826.98	Depth (ft)	67.59	62.83	67.34	67.86	71.69	74.91	77.90	77.45
	895.98	79.00	Elev. (ft)	828.39	833.15	828.64	828.12	824.29	821.07	818.08	818.53
90MW-20	69.47	812.39	Depth (ft)	70.79	69.74	72.07	71.79	74.95	---	---	---
	881.86	79.47	Elev. (ft)	811.07	812.12	809.79	810.07	806.91	DRY	DRY	DRY
05MW-21	10.0	839.0	Depth (ft)	8.26	11.38	5.94	11.64	9.10	---	9.21	13.60
	849.01	15.0	Elev. (ft)	840.75	837.63	843.07	837.37	839.91	DRY	839.80	835.41

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval Depth (ft)	Elev. (ft)	Water Level	Date							
				4/10/14	9/30/14	7/9/15	10/5/15	4/4/16	10/4/16	4/3/17	10/3/17
90MW-10	104.7	814.5	Depth (ft)	89.99	88.30	89.89	91.12	86.94	82.75	80.74	79.09
919.16	114.7	804.5	Elev. (ft)	829.17	830.86	829.27	828.04	832.22	836.41	838.42	840.07
90MW-12	104.9	793.3	Depth (ft)	91.83	89.65	92.25	91.73	90.36	86.68	85.00	83.65
898.17	109.9	788.3	Elev. (ft)	806.34	808.52	805.92	806.44	807.81	811.49	813.17	814.52
90MW-13	37.1	844.9	Depth (ft)	35.76	34.92	35.36	35.15	34.80	34.15	34.10	34.11
882.02	47.1	834.9	Elev. (ft)	846.26	847.10	846.66	846.87	847.22	847.87	847.92	847.91
90MW-14	49.2	800.0	Depth (ft)	43.14	40.87	42.25	43.24	39.44	36.40	34.75	34.75
849.18	69.2	780.0	Elev. (ft)	806.04	808.31	806.93	805.94	809.74	812.78	814.43	814.43
90MW-15	11.1	838.8	Depth (ft)	6.35	10.73	5.17	8.42	3.55	6.83	2.60	10.72
849.91	21.1	828.8	Elev. (ft)	843.56	839.18	844.74	841.49	846.36	843.08	847.31	839.19
90MW-16	79.3	800.5	Depth (ft)	64.79	64.18	63.80	66.96	60.96	58.91	62.76	57.73
879.76	89.3	790.5	Elev. (ft)	814.97	815.58	815.96	812.80	818.80	820.85	817.00	822.03
90MW-17	34.8	844.3	Depth (ft)	30.64	29.38	30.25	29.86	28.98	28.26	27.94	28.49
879.05	44.8	834.3	Elev. (ft)	848.41	849.67	848.80	849.19	850.07	850.79	851.11	850.56
90MW-19	69.42	826.98	Depth (ft)	---	---	---	---	77.97	74.30	71.92	70.80
896.40	79.42	816.98	Elev. (ft)	DRY	DRY	DRY	DRY	818.01	821.68	824.06	825.18
90MW-20	69.47	812.39	Depth (ft)	---	---	---	---	79.20	75.66	74.50	72.96
881.86	79.47	802.39	Elev. (ft)	DRY	DRY	DRY	DRY	802.66	806.20	807.36	808.90
05MW-21	10.0	839.0	Depth (ft)	9.14	12.81	8.60	10.60	8.03	9.45	6.61	12.13
849.01	15.0	834.0	Elev. (ft)	839.87	836.20	840.41	838.41	840.98	839.56	842.40	836.88

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval		Water Level	Date							
	Depth (ft)	Elev. (ft)		4/10/18	10/12/18	4/17/19	9/30/19	4/7/20	10/7/20	4/16/21	10/14/21
90MW-10	104.7	814.86	Depth (ft)	83.53	80.86	77.38	77.45	76.25	78.48	78.89	81.82
919.16	114.7	804.5	Elev. (ft)	835.63	838.30	841.78	841.71	842.91	840.68	840.27	837.34
90MW-12	104.9	793.27	Depth (ft)	87.20	87.46	83.60	83.41	83.97	84.31	85.18	86.56
898.17	109.9	788.3	Elev. (ft)	810.97	810.71	814.57	814.76	814.20	813.86	812.99	811.61
90MW-13	37.1	844.32	Depth (ft)	34.81	34.53	33.94	34.12	34.23	34.39	34.38	35.58
882.02	47.1	834.9	Elev. (ft)	847.21	847.49	848.08	847.90	847.79	847.63	847.64	846.44
90MW-14	49.2	799.51	Depth (ft)	38.47	35.82	33.11	33.76	32.34	34.53	33.58	36.89
849.18	69.2	780.0	Elev. (ft)	810.71	813.36	816.07	815.42	816.84	814.65	815.60	812.29
90MW-15	11.1	840.16	Depth (ft)	5.60	2.35	3.63	3.80	3.51	9.23	3.37	12.03
849.91	21.1	828.8	Elev. (ft)	844.31	847.56	846.28	846.11	846.40	840.68	846.54	837.88
90MW-16	79.3	800.47	Depth (ft)	61.95	55.85	55.51	56.02	54.03	57.48	54.81	60.63
879.76	89.3	790.5	Elev. (ft)	817.81	823.91	824.25	823.74	825.73	822.28	824.95	819.13
90MW-17	34.8	843.90	Depth (ft)	29.94	29.01	28.46	28.75	27.83	28.88	28.25	29.41
879.05	44.8	834.3	Elev. (ft)	849.11	850.04	850.59	850.30	851.22	850.17	850.80	849.64
90MW-19	69.42	826.98	Depth (ft)	74.88	74.09	70.05	69.75	69.12	70.71	71.58	73.46
896.40	79.42	816.98	Elev. (ft)	821.10	821.89	825.93	826.23	826.86	825.27	824.40	822.52
90MW-20	69.47	812.39	Depth (ft)	76.77	68.52	72.65	71.65	72.80	73.45	67.72	75.80
881.86	79.47	802.39	Elev. (ft)	805.09	813.34	809.21	810.21	809.06	808.41	814.14	806.06
05MW-21	10.0	839.01	Depth (ft)	8.85	6.03	8.26	6.64	7.98	10.68	7.31	13.21
849.01	15.0	834.0	Elev. (ft)	840.16	842.98	840.75	842.37	841.03	838.33	841.70	835.80

Table 8 Con't

Monitor Well/ TOC Elev. (ft)	Screened Interval		Water Level	Date							
	Depth (ft)	Elev. (ft)		4/4/22	10/4/22	4/13/23	10/18/23	4/8/24	10/8/24	4/3/25	10/14/25
90MW-10	104.7	814.86	Depth (ft)	85.71	86.41	85.05	87.53	90.91	88.30	91.41	89.44
919.16	114.7	804.5	Elev. (ft)	833.45	832.75	834.11	831.63	828.25	830.86	827.75	829.72
90MW-12	104.9	793.27	Depth (ft)	88.76	89.04	88.88	89.72	91.40	89.55	91.44	90.78
898.17	109.9	788.3	Elev. (ft)	809.41	809.13	809.29	808.45	806.77	808.62	806.73	807.39
90MW-13	37.1	844.32	Depth (ft)	36.14	34.95	34.60	34.85	35.41	34.68	35.30	35.03
882.02	47.1	834.9	Elev. (ft)	845.88	847.07	847.42	847.17	846.61	847.34	846.72	846.99
90MW-14	49.2	799.51	Depth (ft)	39.19	39.45	37.50	41.07	42.55	39.75	42.46	40.75
849.18	69.2	780.0	Elev. (ft)	809.99	809.73	811.68	808.11	806.63	809.43	806.72	808.43
90MW-15	11.1	840.16	Depth (ft)	3.53	11.02	4.53	12.95	3.51	11.04	3.39	10.85
849.91	21.1	828.8	Elev. (ft)	846.38	838.89	845.38	836.96	846.40	838.87	846.52	839.06
90MW-16	79.3	800.47	Depth (ft)	62.21	79.65	60.31	65.35	64.80	63.85	66.83	64.78
879.76	89.3	790.5	Elev. (ft)	817.55	800.11	819.45	814.41	814.96	815.91	812.93	814.98
90MW-17	34.8	843.90	Depth (ft)	29.82	29.90	29.02	29.74	30.19	29.55	30.49	29.80
879.05	44.8	834.3	Elev. (ft)	849.23	849.15	850.03	849.31	848.86	849.50	848.56	849.25
90MW-19	69.42	826.98	Depth (ft)	76.48	76.95	76.24	78.10	80.10	78.20	80.20	78.91
896.40	79.42	816.98	Elev. (ft)	819.50	819.03	819.74	817.88	815.88	817.78	815.78	817.07
90MW-20	69.47	812.39	Depth (ft)	78.20	78.18	77.80	79.40	79.65	78.55	79.65	79.55
881.86	79.47	802.39	Elev. (ft)	803.66	803.68	804.06	802.46	802.21	803.31	802.21	802.31
05MW-21	10.0	839.01	Depth (ft)	4.72	12.34	8.67	13.88	6.25	12.33	7.19	12.35
849.01	15.0	834.0	Elev. (ft)	844.29	836.67	840.34	835.13	842.76	836.68	841.82	836.66

ATTACHMENT F

Explosive Gas Monitoring Results – Compliance

**Annual Methane Gas Evaluation Report
Jackson County Sanitary Landfill
2025**

Amendment #17 - dated May 14, 2024 (Doc #110053) & IDNR Letter Dated January 21, 2025 (Doc #111914)

Date	29-Jan-25	By Jackson County				
Quarter	Jan 1 - March 30					
		Depth to Top Screen (ft)	Depth to Bottom (ft)	Depth to SWL (ft)	Available Screen (ft)	Screen Open to Vadose (ft)
Location/Date	%LEL					
Building	---	---	---	---	---	---
GP-1	---	8.55	18.55	---	---	---
GP-2	---	5.45	9.95	---	---	---
GP-3	0	5.00	14.00	---	---	---
GP-4	---	5.00	16.00	---	---	---
GP-5	---	5.25	9.00	---	---	---
GP-6	0	10.00	40.00	---	---	---

Date	3-Apr-25	By HLW				
Quarter	Apr 1 - Jun 30					
		Depth to Top Screen (ft)	Depth to Bottom (ft)	Depth to SWL (ft)	Available Screen (ft)	Screen Open to Vadose (ft)
Location/Date	%LEL					
Building	0	---	---	---	---	---
GP-1	0	8.55	18.55	8.65	10	0.1
GP-2	0	5.45	9.95	6.90	4.5	1.45
GP-3	0	5.00	14.00	13.50	9	8.5
GP-4	31.8	5.00	16.00	15.40	11	10.4
GP-5	0	5.25	9.00	4.80	3.75	-0.45
GP-6	0	10.00	40.00	39.15	30.00	29.15

Date	8-Jul-25	By Jackson County				
Quarter	Jul 1 - Sep 30					
		Depth to Top Screen (ft)	Depth to Bottom (ft)	Depth to SWL (ft)	Available Screen (ft)	Screen Open to Vadose (ft)
Location/Date	%LEL					
Building	---	---	---	---	---	---
GP-1	---	8.55	18.55	---	---	---
GP-2	---	5.45	9.95	---	---	---
GP-3	0	5.00	14.00	---	---	---
GP-4	---	5.00	16.00	---	---	---
GP-5	---	5.25	9.00	---	---	---
GP-6	0	10.00	40.00	---	---	---

Date	14-Oct-25	By HLW				
Quarter	Oct 1 - Dec 31					
		Depth to Top Screen (ft)	Depth to Bottom (ft)	Depth to SWL (ft)	Available Screen (ft)	Screen Open to Vadose (ft)
Location/Date	%LEL					
Building	0	---	---	---	---	---
GP-1	0	8.55	18.55	18.30	10	9.75
GP-2	0	5.45	9.95	9.70	4.5	4.25
GP-3	0	5.00	14.00	13.50	9	8.5
GP-4	0	5.00	16.00	15.70	11	10.7
GP-5	0	5.25	9.00	8.80	3.75	3.55
GP-6	0	10.00	40.00	38.80	30.00	28.80

ATTACHMENT G

Gas Monitoring Results – Remedial Trench & Passive Vents

Landfill Gas Venting Evaluation Report

Jackson County Sanitary Landfill

Readings are % LEL	Date							
Location	8-Oct-24	3-Apr-25	14-Oct-25					
Passive Trench (West)	101	0	0					
Passive Trench (East)	98.7	0	0					
Vent 1	101	0	82.6					
Vent 2	0	0	0					
Vent 3	101	0	101					
Vent 4	43.7	0	7.8					
Vent 5	94.9	0	50.0					
Vent 6	101	0	101					
Vent 7	101	0	26.8					
Vent 8	101	0	0					
Vent 9	101	101	101					
Vent 10	101	101	101					

101

represents a value that exceeds 100% LEL (greater than 5% methane).